ICS 2018 PHILADELPHIA

ICS 2018 PHILADELPHIA SCIENTIFIC PROGRAMME

TUESDAY 28TH AUGUST

07:30 - 08:30 **CHILDRENS COMMITTEE**

Chair: Dr Giovanni Mosiello (Italy)Members: Dr Stuart B Bauer (United States), Ms Ashani Couchman (Australia), Mr Marcus John Drake (United Kingdom), Nelly Faghani (Canada), Prof Kwang Myung Kim (Korea, South), Prof Rien Johan Marien Nijman (Netherlands), Dr Mario Patricolo (United Arab Emirates), Prof Jian Guo Wen (China), Prof Selcuk Yucel (Turkey)

07:30 - 10:30 **EDUCATION COMMITTEE**

Chair: Dr Elise Jaques Billings De (United States)Members: Mrs Frankie Bates (Canada), Prof Mauro Cervigni (Italy), Dr Margot Damaser (United States), Dr Alex Digesu (United Kingdom), Dr Amy D. Dobberfuhl (United States), Enrico Finazzi Agrò (Italy), Dr Matthew Oliver Fraser (United States), Mrs Paula Igualada-Martinez (United Kingdom), Dr Kari A O Tikkinen (Finland), Dr Nikolaus Veit-Rubin (Austria)

08:00 - 11:00 **CADAVER MASTER CLASS: STRESS URINARY INCONTINENCE**

08:00 - 16:00 **CLINICAL DIRECTIONS IN CONTINENCE CARE**

Chairs: Christine Bradway (United States), Donna L Thompson (United States)Speakers: Shannon Novosad (United States), Nikki McCormick (United States), Mary Wasner (United States), Karen Spriggs (United States), Tony Forsberg (United States), Lisa Kane Low (United States), Dr Sandra J Engberg (United States), Dr Jean F Wyman (United States), Dr Ariana Leigh Smith (United States), Jason Brown (United States), Dr Mikel Gray (United States), Andrea Branas (United States)

08:30 - 10:30 **NURSING COMMITTEE**

Chair: Prof Donna Zimmaro Bliss (United States)Members: Mrs Alison Bardsley (United Kingdom), Prof Jo Booth (United Kingdom), Ms Tamara Dickinson (United States), Dr Sandra J Engberg (United States), Ms Veronica Haggar (United Kingdom), Mrs Amy Elizabeth Hunter (United Kingdom), Prof Cristina Naranjo Ortiz (Spain), Dr Joan Ostaszkiewicz (Australia), Dr Mary H Wilde (United States), Mrs Ka Wai Yeung (Hong Kong)

09:00 - 10:30 **W2 WHERE ARE WE WITH INTRAVESICAL THERAPEUTICS IN 2018?**

Chair: Rufus Cartwright (United Kingdom), Speakers: Mauro Cervigni (Italy), Pradeep Tyagi (United States), Angie Rantell (United Kingdom), Heidi Brown (United States)

09:00 - 10:30 **W3 PREGNANCY-RELATED MUSCULOSKELETAL CONDITIONS: THE PELVIC FLOOR AND LINEA ALBA CONNECTION**

Chair: Sinéad Dufour (Canada), Speakers: Kari Bø (Norway), Stephanie Bernard (Canada), Cynthia Chiarello (United States)

09:00 - 10:30 **W4 ARE WE MEETING THE NEEDS OF OLDER PEOPLE WITH NOCTURNAL LUTS?**

Chair: Karel Everaert (Belgium), Speakers: An-Sofie Goessaert (Belgium), Wendy Bower (Australia), D Michael Whishaw (Australia)

09:00 - 10:30 **W5 NEURODEGENERATIVE DISEASE'S IMPACT ON BLADDER FUNCTION: A MULTIDISCIPLINARY APPROACH IN DIAGNOSIS, TREATMENT AND IMPROVING QUALITY OF LIFE**

Chair: Christian Cobreros (Argentina), Speakers: Carlos D'Ancona (Brazil), Elizabeth Shelly (United States), David Castro-Diaz (Spain)

09:00 - 12:00 **W1 BASIC URODYNAMICS - AN INTERACTIVE WORKSHOP**

Chair: Andrew Gammie (United Kingdom), Speakers: Arturo Garcia-Mora (Mexico), Marcus Drake (United Kingdom)

10:30 - 11:00 **COFFEE BREAK**

11:00 - 12:30 **W6 HANDS ON WORKSHOP ON RECTAL BALLOON TRAINING AND TRANSANAL IRRIGATION IN THE MANAGEMENT OF LOWER BOWEL DYSFUNCTION**

Chair: Paula Igualada-Martinez (United Kingdom), Speakers: Donna Bliss (United States), Julia Herbert (United Kingdom), Linda Ferrari (United Kingdom)

11:00 - 12:30 **W7 NONCELLULAR REGENERATIVE THERAPIES FOR STRESS URINARY INCONTINENCE**

Chair: Margot Damaser (United States), Speakers: James Koudy Williams (United States), Sheila MacNeil (United Kingdom), Yolanda Cruz (Mexico)

11:00 - 12:30 **W8 APPROACH TO CHRONIC PELVIC PAIN AND SEXUAL DYSFUNCTION**

Chair: Kristene Whitmore (United States), Speakers: Karolynn Echols (United States), Erica Fletcher (United States), Jane Meijlink (Netherlands)

11:00 - 12:30 **W9 RADIOTHERAPY OF CERVICAL AND ENDOMETRIAL CANCER – PREVENTION AND MANAGEMENT OF LOWER URINARY TRACT, VAGINAL, VULVAR AND PELVIC FLOOR DYSFUNCTION IN CANCER SURVIVORS**

Chair: Amy Dobberfuhl (United States), Speakers: Elizabeth Kidd (United States), Bertha Chen (United States), Stephanie Bernard (Canada)

11:00 - 13:00 **PHYSIOTHERAPY COMMITTEE**

Chair: Prof Doreen McClurg (United Kingdom)Members: Mrs Gill Brook (United Kingdom), Prof Cristiane Carboni (Brazil), Dr Rebekah Das (India), Nelly Faghani (Canada), Mrs Paula Igualada-Martinez (United Kingdom), Dr Rhonda Kay Kotarinos (United States), Miss Adelia Lucio (Brazil), Mr Peter Meyers (Belgium), Dr Heather Lynn Moky (United States), Dr Melanie Morin (Canada), Prof Cristina Naranjo Ortiz (Spain), Dr Petra J. Voorham - van der Zalm (Netherlands)

11:00 - 13:00 **SCIENTIFIC COMMITTEE MEETING**

Members: Dr Lori A Birder (United States), Dr Elise Jaques Billings De (United States), Dr Roger Roman Dmochowski (United States), Prof Steinar Hunskaar (Norway), Dr Kathleen Frances Hunter (Canada), Dr Jennifer Kruger (New Zealand), Dr Melanie Morin (Canada), Dr Diane K Newman (United States), Dr Ajay Singla (United States), Mr Laurence Stewart (United Kingdom), Prof Adrian Stuart Wagg (Canada), Dr Alan J Wein (United States)

11:00 - 13:00 **STANDARDISATION STEERING COMMITTEE**

Chair: Prof Bernard T Haylen (Australia)Members: Dr Luis Miguel Abranches-Monteiro (Portugal), Ms Jacqueline Cahill (Canada), Dr Alex Digesu (United Kingdom), Mr Stergios K Doumouchtsis (United Kingdom), Dr Sohier Elneil (United Kingdom), Mr Rizwan Hamid (United Kingdom), Dr Salma I Kayani (Kuwait), Mr Alexis M P Schizas (United Kingdom), Dr Elizabeth R Shelly (United States)

11:30 - 14:30 **CADAVER MASTER CLASS: LAPAROSCOPY FOR UROGYNAECOLOGISTS AND FEMALE UROLOGISTS**

12:30 - 13:30 **LUNCH**

13:30 - 15:00 **W11 CULTIVATING THE NEXT GENERATION OF NURSE LEADERS TO CREATE A GLOBAL VISION AND STRATEGIC PLAN FOR GERIATRIC UI/LUTS**

Chair: Annemarie Dowling-Castronovo (United States), Speakers: Mary Palmer (United States), Joan Ostaszkiewicz (Australia), Christine Bradway (United States)

13:30 - 15:00 **W12 MANAGEMENT OF FEMALE STRESS URINARY INCONTINENCE AFTER A FAILED MIDURETHRAL SLING**

Chair: Tufan Tarcan (Turkey), Speakers: David Castro-Diaz (Spain), Ervin Kocjancic (United States), Alex Digesu (United Kingdom)

13:30 - 15:00 **W13 UNDERACTIVE BLADDER—CLINICAL IMPLICATIONS, MECHANISTIC CONCEPTS AND THERAPEUTIC OPTIONS**

Chair: Anthony Kanai (United States), Speakers: Marcus Drake (United Kingdom), Lori Birder (United States), Christopher Fry (United Kingdom)

13:30 - 15:00 **W14 PRACTICAL INTERPRETATION OF RESEARCH EVIDENCE FOR SHARED DECISION MAKING**

Chair: Marco Blanker (Netherlands), Speakers: Kari Tikkinen (Finland), Philippe Violette (Canada)

13:30 - 15:30 **NEUROUROLOGY PROMOTION COMMITTEE**

Chair: Prof Emmanuel Jean Chartier-Kastler (France) Members: Prof Marcio Augusto Averbeck (Brazil), Dr Emmanuel J Braschi (Argentina), Dr Juan Carlos Castaño (Colombia), Prof Carlos Levi D'Ancona (Brazil), Dr Melissa Clare Davies (United Kingdom), Giulio Del Popolo (Italy), Prof Pierre Manuel Denys (France), Mr Rizwan Hamid (United Kingdom), Mrs Collette Haslam (United Kingdom), Prof Magdy M Hassouna (Canada), Prof Thomas M. Kessler (Switzerland), Dr Charalampos Konstantinidis (Greece), Prof Doreen McClurg (United Kingdom), Daniele Minardi (Italy), Dr Jalesh N. Panicker (United Kingdom), Dr Pawan Vasudeva (India)

13:30 - 15:30 **PUBLICATION & COMMUNICATIONS COMMITTEE**

15:00 - 15:30 **COFFEE BREAK**

15:00 - 18:00 **CADAVER MASTER CLASS: NEUROMODULATION IN ASSOCIATION WITH MEDTRONIC**

15:30 - 16:30 **ETHICS COMMITTEE**

Chair: Dr Nina Sarah Davis (United States)Members: Dr Alvaro Bedoya-Ronga (United Kingdom), Prof David Castro-Diaz (Spain), Dr Chris Chatterton (United Kingdom), Dr Elise Jaques Billings De (United States), Ms Tamara Dickinson (United States), Dr Ruwan Janaka Fernando (United Kingdom), Mrs Heidi Moossdorff-Steinhauser (Netherlands), Prof Cristina Naranjo Ortiz (Spain), Dr Ryuji Sakakibara (Japan), Dr Martha Spencer (Canada)

15:30 - 16:30 **URODYNAMICS COMMITTEE**

Chair: Enrico Finazzi Agrò (Italy)Members: Dr Luis Miguel Abranches-Monteiro (Portugal), Dr Alex Digesu (United Kingdom), Dr Alexandre Fornari (Brazil), Dr Michael Louis Guralnick (United States), Dr Alex Tong-Long Lin (Taiwan), Mr Eskinder Solomon (United Kingdom), Mr Tufan Tarcan (Turkey), Prof Jian Guo Wen (China)

15:30 - 17:00 **EARLY CAREER PROFESSIONAL SESSION**

15:30 - 17:00 **W15 THE AGEING BLADDER RECONSIDERED : URINARY HOMEOSTASIS FROM BASKET TO CASKET**

Chair: Phillip Smith (United States), Speakers: Anthony Kanai (United States), Stefan de Wachter (Belgium)

15:30 - 17:00 **W16 CONFIRMATION SURGERY IN GENDER DYSPHORIA: CURRENT STATE AND FUTURE DEVELOPMENTS**
Chair: Ervin Kocjancic (United States), Speakers: Loren Schecter (United States), Randi Ettner (United States)

15:30 - 17:00 **W17 COMPLICATIONS OF NEUROGENIC BLADDER**
Chair: Emmanuel Chartier-Kastler (France), Speakers: Pierre Denys (France), Charalampos Konstantinidis (Greece), Jalesh Panicker (United Kingdom)

17:00 - 19:00 **WELCOME RECEPTION**

19:00 - 23:00 **EARLY CAREER PROFESSIONAL NIGHT OUT**

WEDNESDAY 29TH AUGUST

07:00 - 08:00 **DEVELOPING WORLD COMMITTEE**

08:00 - 08:30 **SOA1: ON MESH, LITIGATION AND WHAT WE CAN LEARN FROM THE LITIGATION NIGHTMARE**
Chair: Dr Alan J Wein (United States)Speaker: Mr Ben Rubinowitz (United States)

08:30 - 08:35 **BREAK TO CHANGE HALLS**

08:35 - 10:05 **SESSION 1 (PODIUM) - BEST CLINICAL**
Chairs: Prof Sherif Mourad (Egypt), Dr Alan J Wein (United States), Mr Laurence Stewart (United Kingdom)

08:35 **1 PRIZE AWARD: BEST CLINICAL ABSTRACT: RELATIONSHIP BETWEEN THE URINARY, UROTHELIAL AND VAGINAL MICROBIOME IN OVERACTIVE BLADDER**
Veit-Rubin N, Mahboobani K S, Cartwright R, Ford A, Asfour V, Digesu A, Fernando R, Khullar V

08:50 **2 PREDICTING RISK OF POST-OPERATIVE URINARY RETENTION IN WOMEN UNDERGOING PELVIC RECONSTRUCTIVE SURGERY**
Li A L K, Zajichek A, Kattan M, Lo K, Lee P E

09:05 **3 PRIZE AWARD: CONSERVATIVE MANAGEMENT AWARD (JOINT): A RANDOMIZED TRIAL COMPARING COMBINED MIDURETHRAL SLING AND BEHAVIORAL/ PELVIC FLOOR THERAPY TO MIDURETHRAL SLING ALONE FOR MIXED URINARY INCONTINENCE – THE ESTEEM TRIAL**
Sung V W, Newman D K, Borello-France D, Richter H E, Lukacz E, Moalli P, Weidner A, Smith A, Dunivan G C, Ridgeway B, Mazloomdoost D, Carper B, Gantz M

09:20 **4 URODYNAMIC AND IMAGING FINDINGS IN MYELOMENINGOCELE INFANTS PREDICT NEED FOR FUTURE BLADDER AUGMENTATION**
Lee T, Marchetti K, Corona L, Shepard C, Vesna I, Kraft K, Bloom D, Wan J, Park J

09:35 **5 THE RELATIONSHIP BETWEEN MRI-DOCUMENTED PUBOVISCERAL MUSCLE TEAR AND URETHRAL CLOSURE PRESSURE IN PRIMIPAROUS WOMEN WITH KNOWN RISK FOR PUBOVISCERAL MUSCLE TEAR DURING THEIR VAGINAL DELIVERY**
Sheng Y, Liu X F, Low L K, Ashton-Miller J A, Miller J M

09:50 **6 ASSOCIATION BETWEEN CUMULATIVE ANTICHOLINERGIC BURDEN AND THE OCCURRENCE OF FALLS AND FRACTURES AMONG PATIENTS WITH OVERACTIVE BLADDER: A RETROSPECTIVE OBSERVATIONAL STUDY**
Lozano-Ortega G, Walker D, Szabo S M, Rogula B, Vonesh E, Campbell N L, Gooch K

08:35 - 10:05 **SESSION 2 (PODIUM SHORT ORAL) - NOCTURIA**
Chairs: Prof Adrian Stuart Wagg (Canada), Prof Jerry G Blaivas (United States), Prof Karl-Dietrich Sievert (Germany)

08:35 **7 EXTENDED FIRST UNINTERRUPTED SLEEP PERIOD FOR OLDER ADULTS FOLLOWING TREATMENT WITH AV002, AN EMULSIFIED MICRODOSE VASOPRESSIN ANALOG**
Kobashi K, Brucker B M, Yang A, Francis L, Newman D K

08:42 **8 NOVEL PROLONGED ACTION FORMULATION OF ACETAMINOPHEN-IBUPROFEN COMBINATION (PAXEROL®) THERAPY FOR TREATMENT OF NOCTURIA: A MULTI-CENTER, RANDOMIZED, DOUBLE BLINDED, PLACEBO-CONTROLLED, 4-ARM PHASE 2 TRIAL**
Kashan M, Khusid J A, Weiss J P, Rauscher F, Blair B, Efros M, Kaminesky J, Contreras J, Rydin I, Xie L, Whisnant J, Lee K

08:50 **9 IN-HOSPITAL FALLS ASSOCIATED WITH NOCTURNAL TOILETING: A RETROSPECTIVE PILOT STUDY**
Decalf V, Bower W F, Pieters R, Petrovic M, Eeckloo K, Everaert K

08:57 **10 SAFETY AND EFFICACY OF DESMOPRESSIN ORALLY DISINTEGRATING TABLET 25/50MG IN PATIENTS WITH NOCTURIA AND MILD DAYTIME URINARY SYMPTOMS**
Weiss J P, Malmberg A, Juul K V

09:05 **11 POPULATION-BASED ANALYSIS OF THE RELATIONSHIP BETWEEN FALLS, FRACTURES AND NOCTURIA**
Schneider T, Gedamke M, Guthoff-Hagen S, Vosgerau S, Michel M C

09:12 **12 THE RELATION BETWEEN NOCTURNAL POLYURIA AND NON-DIPPING BLOOD PRESSURE IN MALE PATIENTS WITH LUTS**
Takayama M, Omori S, Iwasaki K, Shiomi E, Ikarashi D, Takata R, Sugimura J, Abe T, Obara W

09:20 **13 PREVALENCE AND RISK FACTORS OF NOCTURNAL POLYURIA IN FEMALE OVERACTIVE BLADDER SYNDROME**
Hsiao S, Chang T, Chen C, Wu W, Lin H

09:27 **14 DEVELOPMENT OF NOCTURIA PHENOTYPES**
Blaivas J, Kreder K, Chaikin D, O'Boyle A L, Poon M, Dayan L

09:35 **15 NOCTURIA IN MALES WITH LUTS: PREVALENCE AND COMPARISON BETWEEN INTERNATIONAL PROSTATE SYMPTOM SCORE AND FREQUENCY-VOLUME CHARTS. AN OBSERVATIONAL, PROSPECTIVE DOUBLE-CENTRE STUDY.**
Bassi S, Rubilotta E, Balzarro M, Righetti R, Pirozzi M, Processa-Ii T, Trabacchin N, Curti P, D'Amico A, Cerruto M A, Artibani W

09:42 **16 REDUCING NOCTURIA IN COMMUNITY DWELLING OLDER PEOPLE WITH CARDIOVASCULAR DISEASE: A PROSPECTIVE STUDY TO MEASURE THE EFFECTS OF ACTIVE LEG ELEVATION**
Ervin C F, Murphy M, Rose G E, Ong T, Whishaw D M, Bower W F

09:50 **17 NOCTURIA DIAGNOSIS IN LOWER URINARY TRACT SYMPTOM (LUTS) PATIENTS IS ASSOCIATED WITH DECREASED SLEEP QUALITY, WORK PRODUCTIVITY AND DAYTIME TIREDNESS: A PHYSICIAN AND PATIENT SURVEY**
Jhaveri J, Anderson P, Piercy J, Wood R, Guo A

09:57 **18 RAPID NOCTURIA EFFICACY OF AV002, AN EMULSIFIED MICRODOSE VASOPRESSIN ANALOG**
Campeau L, Yang A, Francis L, Newman D K

08:35 - 10:05 **SESSION 3 (PODIUM SHORT ORAL) - E-TECHNOLOGIES AND INNOVATIVE TREATMENT**
Chairs: Dr Jennifer Kruger (New Zealand), Dr Elizabeth Rose Mueller (United States), Dr Janis Miriam Miller (United States)

08:35 **19 USER EVALUATION OF WEB-BASED INFORMATION FOR MEN WITH INCONTINENCE AFTER TREATMENT FOR PROSTATE CANCER**
Macaulay M, Clarke-O'Neill S, Cottenden A, Fader M

08:42 **20 APP-BASED TREATMENT FOR WOMEN WITH URINARY INCONTINENCE: WHAT DO PATIENTS EXPERIENCE AND PREFER?**
Wessels N J, Hulshof L, Loohuis A M M, Jellema P, Blanker M H

08:50 **21 FACTORS ASSOCIATED WITH COMPLETING SELF-MANAGEMENT AND ACHIEVING IMPROVEMENT WITH A FREE MOBILE APP FOR URINARY INCONTINENCE**
Nyström E, Söderström L, Samuelsson E

08:57 **22 EVALUATION OF PELVIC FLOOR MUSCLES TRAINING WITH GAMETHERAPY IN THE QUALITY OF LIFE OF PATIENTS WITH MIXED URINARY INCONTINENCE**
Bezerra L, Oliveira M C, Oliveira G, Magalhães A, Micussi M T

09:05 **23 SELF-MANAGEMENT OF ANAL INCONTINENCE AND INTEREST IN A SUPPORTIVE M-HEALTH APP AMONG WOMEN**
Bliss D Z, Gurvich O V, Patel S, Meyer I, Richter H E

09:12 **24 THE EFFECTS OF THE ADDITION OF A NEW PORTABLE PERINEOMETER (KEGELQ) ON STRESS URINARY INCONTINENCE DURING PELVIC FLOOR MUSCLE EXERCISE IN WOMEN: A MULTICENTER, PROSPECTIVE RANDOMIZED, CONTROLLED TRIAL**
Lee Y J, Lee D H, Jeong Y S, Lee S, Cheon S H, Lee Y K, Kim S H, Cho S Y, Oh S, Jeong S J

09:20 **25 THE USE OF MOBILE HEALTH TECHNOLOGY TO SUPPORT POST-PARTUM PELVIC HEALTH: A RANDOMIZED MIXED METHODS PILOT STUDY**
Dufour S, Fedorkow D, Fang Q

09:27 **26 DEVELOPMENT AND USE OF AN ALGORITHM FOR IDENTIFYING WOMEN WITH URGENCY OR MIXED URINARY INCONTINENCE SUITABLE FOR E-HEALTH TREATMENT**
Wadensten T, Nyström E, Franzén K, Stenzelius K, Malmberg L, Samuelsson E

09:35 **27 DIGITAL HEALTH - DOES A DIGITAL HOME BLADDER MONITORING DEVICE INCLUDING UROFLOWMETRY AND VOIDING DIARY IMPROVE PATIENT COMPLIANCE AND DATA ACCURACY? INITIAL FEASIBILITY PILOT STUDY**
Hidas G, Khoury A E

09:42 **28 IMPACT OF A PELVIC FLOOR MUSCLE TRAINING PROGRAM ON THE INTERNAL PUDENDAL ARTERY AND THE DORSAL CLITORAL ARTERY BLOOD FLOW IN WOMEN WITH GENITOURINARY SYNDROME OF MENOPAUSE**
Mercier J, Tang A, Morin M, Lemieux M, Reichetzer B, Khalifé S, Dumoulin C

09:50 **29 BEYOND THE TRAINING: THE BENEFITS OF PEER SUPPORT AND IMPROVED SELF-PERCEPTIONS EXPERIENCED BY WOMEN COMPLETING A 12 WEEK PFM TRAINING PROGRAM**
Saint-Onge K, Fraser S, Southall K, Fréchette-Chaîné É, Morin M, Dumoulin C

09:57 **30 ACUPUNCTURE FOR URINARY INCONTINENCE IN CHINESE WOMEN: A RANDOMIZED CONTROLLED TRIAL**
Cheung Y K R, Law P M M, Lee L L, Ng K, Chan S C S

08:35 - 10:05 **W18 ICS CORE CURRICULUM (FREE): INTERMITTENT CATHETERISATION IN PATIENTS WITH NEUROLOGICAL DISEASE: INDICATIONS AND CHALLENGE**
Chair: Collette Haslam (United Kingdom), Speakers: Rizwan Hamid (United Kingdom), Emmanuel Braschi (Argentina), Pawan Vasudeva (India), Doreen McClurg (United Kingdom)

08:35 - 11:35 **W19 ICS CORE CURRICULUM (FREE): URODYNAMICS – EVERYTHING YOU NEED TO KNOW – BASIC AND ADVANCED**
Chair: Enrico Finazzi Agrò (Italy), Speakers: Tufan Tarcan (Turkey), Eskinder Solomon (United Kingdom), Jian Guo Wen (China), Alexandre Fornari (Brazil), Luis Abranches-Monteiro (Portugal), Peter Rosier (Netherlands), Alex Digesu (United Kingdom), Paul Abrams (United Kingdom)

08:35 - 11:35 **W20 AMBULATORY UROGYNAECOLOGY**
Chair: Linda Cardozo (United Kingdom), Speakers: Angie Rantell (United Kingdom), Dudley Robinson (United Kingdom), Stefano Salvatore (Italy), Alex Digesu (United Kingdom), Roger Dmochowski (United States)

10:05 - 10:30 **COFFEE BREAK & EXHIBITION**

10:05 - 11:30 **MEETINGS COMMITTEE**
Chair: Prof Sherif Mourad (Egypt)Members: Giulio Del Popolo (Italy), Mr Marcus John Drake (United Kingdom), Dr Alan J Wein (United States)

10:30 - 12:00 **SESSION 4 (PODIUM SHORT ORAL) - NEUROGENIC BLADDER**
Chairs: Dr David Ginsberg (United States), Dr Chloe Slocum (United States), Prof Karl-Dietrich Sievert (Germany)

10:30 **31 A SYSTEMATIC REVIEW OF SEXUAL PROBLEMS IN WOMEN WITH MULTIPLE SCLEROSIS: PATTERNS OF DYSFUNCTION AND MANAGEMENT OPTIONS**
Polat C, Tulek Z, Brunskill K, Haslam C, Uchiyama T, Panicker J N

10:37 **32 SPECTRAL ANALYSIS OF URODYNAMIC DATA CAN PICK UP LOW AMPLITUDE PHASIC BLADDER AND RECTAL CONTRACTIONS IN NEUROGENIC BLADDER PATIENTS**
Franco I, Zaveri H P, Collett-Gardere T F, Murphy K, Hittelman A

10:45 **33 "BLADDER-FIRST" FORM OF MULTIPLE SYSTEM ATROPHY: A MESSAGE FROM URO-NEUROLOGISTS**
Sakakibara R, Panicker J N, Simeoni S, Uchiyama T, Yamamoto T, Tateno F, Aiba Y, Kishi M

10:52 **34 NEURO-UROLOGY: IS THERE STILL A PLACE FOR BLADDER AUGMENTATION AND URINARY DIVERSION?**
Bywater M, Fröhlich M, Eberli D, Kessler T M

11:00 **35 PATHOPHYSIOLOGICAL BASIS FOR LOWER URINARY TRACT DYSFUNCTION IN A COHORT OF PATIENTS WITH MITOCHONDRIAL DISORDERS**
Uchiyama T, Poole O, Georgopoulos P, Pakzad M H, Hann M, Emmanuel A, Pitceathly R, Panicker J N

11:07 **36 PRIZE AWARD: BEST IN CATEGORY PRIZE: RESTING STATE ANALYSIS OF SUBTHALAMIC NUCLEUS FUNCTIONAL CONNECTIVITY ACROSS BLADDER STATES IN PARKINSON'S DISEASE**
Roy H, Roy C, Griffiths D J, Green A, Menke R

11:15 **37 CORRELATION OF VIDEO-URODYNAMIC FINDINGS AND ELECTROPHYSIOLOGICAL CHARACTERISTICS WITH LEVEL AND DEGREE OF SPINAL CORD INJURY**
Liao L, Wang Z

11:22 **38 THE PROFILE OF BLADDER AND BOWEL COMPLAINTS IN PATIENTS WITH HEREDODEGENERATIVE SPINOCEREBELLAR ATAXIA**
Uchiyama T, Ribeiro J, Giunti P, Georgopoulos P, Pakzad M H, Yamanishi T, Sakakibara R, Kuwabara S, Hirata K, Panicker J N

11:30 **39 PATIENT REPORTED OUTCOMES AFTER ILEOCYSTOPLASTY IN SPINAL CORD INJURY POPULATION**
Sakalis V, Rachel O, Philippa C, Peter G, Melissa D

11:37 **40 10 YEAR EXPERIENCE OF INTRA-DETRUSOR BOTULINUM TOXIN TYPE A INJECTIONS IN CHILDREN AND YOUNG PEOPLE WITH NEUROGENIC DETRUSOR OVER-ACTIVITY FOLLOWING SPINAL CORD INJURY – IS IT A LONG TERM MANAGEMENT SOLUTION?**
Hamid R, Shah J, Lee F, Helal M, Gall A, Knight S

11:45 **41 ONABOTULINUMTOXINA AMELIORATES AUTONOMIC DYSREFLEXIA WHILE IMPROVING LOWER URINARY TRACT FUNCTION AND QUALITY OF LIFE IN INDIVIDUALS WITH SPINAL CORD INJURY**
Walter M, Kran S L, Nigro M K, Stothers L, Rapaport D, Kavanagh A, Krassioukov A V

11:52 **42 EFFECT OF GESTATIONAL DIABETES MELLITUS ON PELVIC FLOOR MUSCLE FUNCTION: THREE-DIMENSIONAL ULTRASOUND**
Barbosa A M P, Pinheiro F A, Sartorão Filho C I, Prudencio C B, Kenickel S, Orlandi M I G, Pascon T, Sarmento B V, Melo J V F, Oliveira L G d, Sarmento B V, Rudge M V C

10:30 - 12:00 **SESSION 5 (PODIUM SHORT ORAL) - BASIC SCIENCE: PHARMACOLOGY**
Chairs: Prof Karl-Erik Andersson (United States), Prof Larissa Virginia Rodriguez (United States)

10:30 **43 SILDENAFIL, A PHOSPHODIESTERASE TYPE 5 INHIBITOR, AUGMENTS BLADDER AFFERENT ACTIVITY IN MOUSE.**
Ito H, Chakrabarty B, Fry C H, Kanai A J, Drake M, Pickering A

10:37 **44 CENTRAL ANGIOTENSIN II INDUCES FREQUENT URINATION THROUGH INHIBITION OF GABAERGIC NERVOUS SYSTEM AND STIMULATION OF ANGIOTENSIN II TYPE 1 RECEPTOR DOWNSTREAM SIGNALING IN RATS**
Shimizu S, Shimizu T, Nakamura K, Higashi Y, Aratake T, Zou S, Hamada T, Nagao Y, Ueba Y, Yamamoto M, Honda M, Saito M

10:45 **45 EFFECT OF LYSOPHOSPHATIDIC ACID AND ASP6432, A NOVEL TYPE 1 LYSOPHOSPHATIDIC ACID RECEPTOR ANTAGONIST, ON BLADDER STORAGE FUNCTION IN RATS**
Sakamoto K, Noguchi Y, Ueshima K, Imazumi K, Ohtake A, Takeda M, Masuda N

10:52 **46 INHIBITION OF PHOSPHODIESTERASE TYPE 9 (PDE9) IMPROVES STORAGE AND VOIDING DYSFUNCTION IN MICE WITH SPINAL CORD INJURY**
Shimizu N, Hashimoto M, Suzuki T, Takaoka E, Kwon J, Shimizu T, Wada N, Hirayama A, Uemura H, Kanai A J, De Groat W C, Yoshimura N

11:00 **47 DEVELOPMENT OF AN IN VITRO UROTHELIAL CELL CULTURE MODEL TO STUDY THE EFFECT OF PANNEXIN-1 CHANNEL ON CYTOKINE INDUCED DAMAGE OF UROTHELIAL INTEGRITY**
Sana-Ur-Rehman H, Moore K H, Mansfield K J, Liu L

11:07 **48 INVOLVEMENT OF PIEZO-1 ION CHANNEL IN THE REGULATION OF ACETYLCHOLINE RELEASE IN THE MOUSE URINARY BLADDER**
Bashir S, Sana-Ur-Rehman H, Noreen M, Ahsan H

11:15 **49 BRAIN CORTICOTROPIN-RELEASING FACTOR RECEPTOR TYPE 1 IS INVOLVED IN CENTRALLY ADMINISTERED BOMBESIN-INDUCED FREQUENT URINATION IN RATS**
Shimizu T, Zou S, Shimizu S, Wada N, Takai S, Shimizu N, Yamamoto M, Higashi Y, Yoshimura N, Saito M

11:22 **50 HYDROGEN SULFIDE HAS A ROLE AS AN ENDOGENOUS RELAXATION FACTOR IN THE BLADDER AND PROSTATE OF MALE RATS**
Shimizu T, Zou S, Shimizu S, Higashi Y, Nakamura K, Ono H, Aratake T, Yamamoto M, Honda M, Saito M

11:30 **51 EFFECTS OF RQ-00434739, A TRANSIENT RECEPTOR POTENTIAL MELASTATIN 8 (TRPM8) CHANNEL ANTAGONIST, ON DEEP BODY TEMPERATURE AND ON BLADDER FUNCTION IN RATS**
Aizawa N, Ohshiro H, Watanabe S, Kume H, Igawa Y

11:37 **52 BLOCKAGE OF PURINERGIC P2X7 RECEPTOR REDUCES MUCOSA DAMAGE AND RESTORES DIMINISHED CONTRACTILITY IN AN EX-VIVO INFLAMMATION MODEL OF PORCINE BLADDER**
Taidi Z, Mansfield K J, Moore K H, Liu L

11:45 **53 THE ROLE OF MITOCHONDRIA IN IRRADIATION-INDUCED UROTHELIAL DYSFUNCTION—IMPLICATIONS FOR RADIATION CYSTITIS**
Ikeda Y, Kullmann F A, Zabbarova I, Wipf P, Birder L A, Kanai A J

11:52 **54 HISTAMINE H3 RECEPTOR INHIBITED THE INFLAMMATORY RESPONSE DURING C2C12 STRIATED MYOGENESIS INDUCED BY EXOGENOUS ALPHA TUMOR NECROSIS FACTOR**
Chen Y, Xu P, He Y L, Feng J J, Yan S H, Li Y D, Li Y L, Wen J G

10:30 - 12:00

SESSION 6 (PODIUM SHORT ORAL) - INTERSTITIAL CYSTITIS / BLADDER PAIN SYNDROME 1

Chairs: Dr Yukio Homma (Japan), Prof Philip Mark Hanno (United States), J. Quentin Clemens (United States)

10:30 **55 RANDOMIZED, PLACEBO-CONTROLLED, CLINICAL TRIAL IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME SHOWS COMMON SYMPTOM PRESENTATION BUT HIGHER RATES OF HUNNER LESIONS IN EUROPEAN PATIENTS**
Moldwin R M, Hanno P, Biagi H, Butterfield N

10:37 **56 PRIZE AWARD: BEST IN CATEGORY PRIZE: MRI IMAGING OF HUMAN BLADDER WALL USING INTRAVESICAL NOVEL CONTRAST MIXTURE: APPLICATIONS IN PAINFUL BLADDER SYNDROME/ INTERSTITIAL CYSTITIS (PBS/IC)**
Chermansky C, Janicki J, Moon C, Kaufman J, Tyagi P

10:45 **57 TITLE: EVALUATION OF URINARY CULTURES IN PATIENTS WITH INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME: ARE THERE DIFFERENCES IN COLONY COUNTS?**
Rinko R, Munoz J, Dawson M, Rana N, Whitmore K

10:52 **58 STOOL AND VAGINAL MICROBIOTA TESTS AS A DIAGNOSTIC TOOL IN WOMEN WITH PAINFUL BLADDER SYNDROME / INTERSTITIAL CYSTITIS**
Hessdoerfer E

11:00 **59 A SYSTEMATIC REVIEW OF SURGICAL TECHNIQUES FOR THE TREATMENT OF BLADDER PAIN SYNDROME/ INTERSTITIAL CYSTITIS**
Bratt D, Downey A P, Osman N I, Mangera A, Reid S V R, Inman R I, Chapple C R

11:07 **60 EVALUATION OF SELF INSTILLATION OF CHONDROITINE SULFATE VERSUS INSTILLATIONS GIVEN BY A DEDICATED NURSE IN THE TREATMENT OF PATIENTS SUFFERING FROM BLADDER PAIN SYNDROME**
Hjuler A, Rasmussen S A, Jensen B T, Ryhammer A M

11:15 **61 USEFULNESS OF LONG-TERM DIETARY MANIPULATION FOR FEMALE PATIENTS WITH PAINFUL BLADDER SYNDROME/INTERSTITIAL CYSTITIS.**
Oh-oka H

11:22 **62 NOCICEPTIVE PAIN HAS A HIGH PREVALENCE IN PATIENTS WITH PRIMARY BLADDER NECK OBSTRUCTION**
Camerota T C, Leoni M

11:30 **63 DOES THE REPEATED HYDRODISTENSION WITH TRANSURETHRAL COAGULATION FOR INTERSTITIAL CYSTITIS WITH HUNNER LESIONS CAUSE BLADDER CONTRACTION?**
Tomoe H

11:37 **64 THERAPEUTIC EFFECT OF REPEAT PLATELET-RICH-PLASMA INTRAVESICAL INJECTIONS FOR IC/BPS REFRACTORY TO CONVENTIONAL TREATMENT**
Lee C, Wu S, Lin T, Kuo H

11:45 **65 WHAT ARE THE MOST EFFECTIVE INTERVENTIONS FOR TREATMENT OF BLADDER PAIN SYNDROME/ INTERSTITIAL CYSTITIS? A NETWORK META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS**
Imamura M, Scott N, Wallace S, Ogah J, Ford A, Brazzelli M

11:52 **66 ANXIETY SCORE DOES NOT INFLUENCE TREATMENT OUTCOME IN PATIENTS WITH INTERSTITIAL CYSTITIS/ BLADDER PAIN SYNDROME**
Yu W, Yeh H, Kuo H

10:30 - 12:00 **W21 THE OVERACTIVE PELVIC FLOOR**
Chair: Anna Padoa (Israel), Speakers: Linda McLean (Canada), Melanie Morin (Canada), Carolyn Vandyken (Canada)

12:00 - 13:00 **LUNCH, E-POSTERS AND EXHIBITION**

12:00 - 13:00 **PELVIC FLOOR EXERCISE CLASSES FOR PRE AND POST-NATAL WOMEN**
Chair: Prof Kari Bø (Norway)

12:00 - 13:00 **SESSION 7 (OPEN DISCUSSION EPOSTER) - OPEN DISCUSSION E-POSTERS 1**

12:05 **67 LONG-TERM PREVALENCE OF POST-PROSTATECTOMY URINARY INCONTINENCE ACCORDING TO DIFFERENT DEFINITIONS AND ITS ASSOCIATION WITH PERIOPERATIVE PARAMETERS**
Averbeck M A, da Silva L F B, Rhoden E L

12:10 **68 EXPRESSION OF NERVE GROWTH FACTOR, VASCULAR ENDOTELIAL GROWTH FACTOR AND CONNECTIVE TISSUE GROWTH FACTOR IN THE DETRUSOR OF PATIENTS WITH BLADDER OUTLET OBSTRUCTION DUE TO BENIGN PROSTATIC HYPERPLASIA**
Bellucci C H S, Hemerly T S, Bessa Jr J, Barbosa J A B A, Guimarães V R, Viana N I, Camargo G M, Reis S T d, Bruschini H, Srougi M, Leite K R, Gomes C M

12:15 **69 WHAT DO MEN WITH UNCOMPLICATED LUTS EXPECT FROM SECONDARY CARE?**
Brandenbarg P, Rooijers P, Steffens M, Van Balken M, Blanker M H

12:20 **70 EVIDENCE AGAINST CONSENSUS: WHAT SHOULD BE THE COMPONENTS OF A NEW ONLINE SELF-MANAGEMENT PROGRAM FOR MEN WITH UNCOMPLICATED LUTS?**
Brandenbarg P, Slijkhuis B, Jellema P, Steffens M, Van Balken M, Blanker M H

12:25 **71 COST-EFFECTIVENESS OF GREENLIGHT PHOTOSELECTIVE VAPORIZATION OF THE PROSTATE COMPARED TO TRANSURETHRAL RESECTION OF THE PROSTATE FOR BENIGN PROSTATIC HYPERPLASIA**
Elterman D, Masucci L, Erman A, Shepherd S, Krahn M

12:30 **72 EFFICACY AND SAFETY OF PROACT FOR THE TREATMENT OF MALE POST-SURGICAL STRESS URINARY INCONTINENCE: A SYSTEMATIC REVIEW OF LITERATURE**
Orecchia L, Iacovelli V, Farullo G, Turbanti A, Petta F, Vespasiani G, Finazzi Agrò E

12:35 **73 LONG-TERM EFFICACY OF ADJUSTABLE DEVICE FOR MALE STRESS URINARY INCONTINENCE**
Garde-García H, González-López R, González-Enguita C

12:40 **74 COMPARISON OF POSTOPERATIVE CONTINENCE STATUS OF THE PATIENTS WHO UNDERWENT ROBOT-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY AND RETROPUBIC RADICAL PROSTATECTOMY**
Kizilay F, Ismaylov F, Simsir A, Özyurt C

12:45 **75 MALE SLING VERSUS ARTIFICIAL URINARY SPHINCTER: WHICH DEVICE SHOULD WE CHOOSE?**
Gonzalez M I, Esquenazi G, Jaunarena J H, Zubieta M E, Favre G A, Tejerizo J C

12:50 **76 THE ASSOCIATION OF RISK FACTORS WITH LOWER URINARY TRACT SYMPTOMS: THE COMMUNITY HEALTH SURVEY.**
Kim K S, Kim Y T, Lee J A, Choi B Y, Moon H S

12:05 **77 THE ROLE OF EDUCATIONAL LEVEL AND COGNITIVE STATUS OF PATIENTS ON OUTCOMES AND REVISION RATES OF ARTIFICIAL URINARY SPHINCTER IN MEN WITH POST-PROSTATECTOMY INCONTINENCE: THE FIRST MULTI-INSTITUTIONAL STUDY IN TURKISH MEN**
Keles A, Onur R, Dincer M, Koca O, Coskun B, Karakeci A, Garayev A

12:10 **78 CORRELATION OF TRANSIENT RECEPTOR POTENTIAL CATION CHANNEL SUBFAMILY V PROTEINS IN PATIENTS WITH DIFFERENT CLINICAL SEVERITY OF KETAMINE CYSTITIS**
Yang H, Jhang J, Wang H, Huang H, Zhai W, Kuo H

12:15 **79 THE BASELINE VIDEOURODYNAMIC FINDINGS AND LONG-TERM THERAPEUTIC OUTCOME IN MALE IC/BPS PATIENTS**
Kuo Y, Jhang J, Yeh H, Kuo H

12:20 **80 MORBIDITY RATE AND MEDICAL UTILIZATION OF CHRONIC PROSTATITIS-POPULATION BASED STUDY**
Lee M, Chang K, Lin H, Wu H

12:25 **81 RISK FACTORS OF DETERIORATION OF LOWER URINARY TRACT SYMPTOMS IN ELDERLY MEN - COMMUNITY-BASED, PROSPECTIVE LONGITUDINAL COHORT STUDY**
Lee S H, Choo M S, Cho S T, Oh C Y, Kim J K

12:30 **82 THE EFFECT OF MIRABEGRON ON BLADDER BLOOD FLOW IN A RAT MODEL OF BLADDER OUTLET OBSTRUCTION**
Majima T, Funahashi Y, Takai S, Matsukawa Y, Yamamoto T, Gotoh M

12:35 **83 DIURETIC ADAPTATION AS A PREDICTOR OF THE EFFICACY OF ADD-ON THERAPY FOR OVERACTIVE BLADDER SYMPTOMS IN MEN TREATED FOR LOW URINARY TRACT SYMPTOMS**
Matsuoka K, Aikawa K, Akaihata H, Hoshi S, Hata J, Sato Y, Kataoka M, Ogawa S, Haga N, Ishibashi K, Kojima Y

12:40 **84 PROPOSAL OF A NEW WAY TO EVALUATE THE EXTERNAL SPHINCTER FUNCTION PRIOR MALE SLING SURGEY**
Moser D, D`Ancona C, Voris B R I, Martins D, Jane K, Herny G

12:45 **85 ICIQ-SF SCORE VERSUS PAD USE FOR CONTINENCE ASSESSMENT FOLLOWING RADICAL PROSTATECTOMY**
Mungovan S F, Graham P L, Pascual J I, Robles J, Patel M I, Tienza A

12:50 **86 SENSORY PROTEIN EXPRESSION AND URETHRAL MUCOSAL DYSFUNCTION IN THE PATHOGENESIS OF MALE BLADDER NECK DYSFUNCTION AND BENIGN PROSTATIC OBSTRUCTION**
Jiang Y, Lee Y, Lee C, Kuo H

12:05 **87 MULTICENTRE EXPERIENCE WITH THE REFILLABLE ARTIFICIAL URINARY SPHINCTER ZSI 375 PF**
Padilla-Fernández B, González-López R, Resel-Folkersma L, Garde-García H, Hernández-Hernández D, Madurga-Patuel B, Lorenzo-Gómez M F, Moreno-Sierra J, González-Enguita C, Castro-Díaz D M

12:10 **88 RESULTS OF THE SURGICAL CORRECTION OF MALE URINARY INCONTINENCE DUE TO PROSTATE CANCER TREATMENT WITH REMEEX®**
Padilla-Fernández B, Sanz-Ruiz A, Sousa-Escandón A, Perán-Teruel M, Hernández-Hernández D, García-Cenador M B, Castro-Díaz D M, Lorenzo-Gómez M F

12:15 **89 SINGLE-INCISION TECHNIQUE TO IMPLANT AN ARTIFICIAL URINARY SPHINCTER IN MALE PATIENTS**
Pottek T S, Neugart F

12:20 **90 TECHNIQUE TO IMPLANT THE NEW ARTIFICIAL URINARY SPHINCTER VICTO+**
Pottek T S, Huebner W A

12:25 **91 EVALUATION OF QUALITY OF LIFE WITH DESMOPRESSIN ADD ON ALPHA BLOCKERS IN TREATMENT OF LOWER URINARY TRACT SYMPTOMS OF BENIGN PROSTATIC HYPERPLASIA**
Rasheed M, ElBendary M, Bakary M, ElNagar I

12:30 **92 VOIDING PATTERN MONITORING, IS IT IMPORTANT IN EVALUATION OF SUCCESSFUL DISTAL HYPOSPADIAS REPAIR SURGERY?**
Rasheed M, ElBendary M, Damhougy M

12:35 **93 THE USE OF NANOTECHNOLOGY STRUCTURED WATER MAGNALIFE IMPROVES THE OUTCOME OF CONSERVATIVE TREATMENT FOR LOWER URINARY TRACT SYMPTOMS.**
M. Sami A K, Akha Weas I H, A. Alrahman M S

12:40 **94 NOVEL IMAGING TECHNIQUES REVEAL DISTURBED FUNCTION OF PROSTATE DUCTS BY ALPHA1-ADRENERGIC RECEPTOR BLOCKERS BUT NOT BY PDE5-INHIBITORS IN THE TREATMENT OF BPH**
Seidensticker M, Exintaris B, Kügler R, Mietens A, Tasch S, Wagenlehner F M, Risbridger G P, Middendorff R

12:45 **95 EFFICACY AND SAFETY OF DOXAZOSIN VERSUS TAMSULOSIN FOR THE TREATMENT OF MALE LUTS – A NETWORK META-ANALYSIS**
Oelke M, Chopra I, Patel D, Tang W Y, Hassan T

12:50 **96 WITH WHAT DEGREE OF IMPROVEMENT IN PATIENT REPORTED OUTCOME MEASURES IS RESOLUTION OF OAB SYMPTOMS ASSOCIATED? DATA FROM A POOLED ANALYSIS OF OAB TREATMENT WITH FESOTERODINE.**
Wagg A, LaBossiere J R, Herschorn S, Fernet M, Carlsson M, Oelke M

12:55 **97 ISOSAMIDIN, AN EXTRACT OF PEUCEDANUM JAPONICUM, MAY HAVE PHARMACOLOGICAL POTENCY IN THE TREATMENT OF MALE LOWER URINARY TRACT SYMPTOMS**
Suzuki T, Otsuka A, Ito Y, Yamada S, Miyake H, Ozono S

12:05 **98 NOVEL TUBE POSITIONING TECHNIQUE FOR AMS 800™ ARTIFICIAL URINARY SPHINCTER PLACEMENT**
Balzarro M, Rubilotta E, Sebben M, Bassi S, Cerruto M A, Porcaro A B, Pianon R, Artibani W

12:10 **99 COMPARISON BETWEEN UROFLOWMETRY AND INTERNATIONAL PROSTATE SYMPTOMS SCORE IN MALES WITH LOWER URINARY TRACT SYMPTOMS**
Rubilotta E, Balzarro M, Righetti R, Trabacchin N, Bassi S, Processali T, Pirozzi M, Curti P, Cerruto M A, D'Amico A, Artibani W

12:15 **100 NOCTURNAL POLYURIA IN MALES WITH LUTS: PREVALENCE AND ROLE OF THE INTERNATIONAL PROSTATE SYMPTOM SCORE AND UROFLOWMETRY IN THE OUTPATIENT EVALUATION. AN OBSERVATIONAL, PROSPECTIVE DOUBLE-CENTERE STUDY.**
Bassi S, Rubilotta E, Balzarro M, Righetti R, Trabacchin N, Processali T, Pirozzi M, Curti P, Cerruto M A, D'Amico A, Artibani W

12:20 **101 ONABOTULINUMTOXINA DETRUSOR INJECTION IMPROVES FEMALE SEXUAL FUNCTION IN WOMEN WITH IDIOPATHIC WET OVERACTIVE BLADDER SYNDROME**
Balzarro M, Rubilotta E, Braga A, Bassi S, Processali T, Artibani W, Serati M

12:25 **102 A COMPARISON OF SCHAEFER, INTERNATIONAL CONTINENCE SOCIETY AND BLADDER CONTRACTILITY INDEX NOMOGRAMS IN THE DIAGNOSIS OF OBSTRUCTION AND DETRUSOR UNDERACTIVITY IN MEN WITH LOWER URINARY TRACT SYMPTOMS**
Rubilotta E, Balzarro M, Trabacchin N, Bassi S, D'Amico A, Cerruto M A, Artibani W

12:30 **103 A NEW ARTIFICIAL URINARY SPHINCTER (VICTO) WITH CONDITIONAL OCCLUSION FOR STRESS INCONTINENCE: PRELIMINARY CLINICAL RESULTS.**
Weibl P, Ameli G, Hoelzel R, Rutkowski M, Huebner W A

12:35 **104 USING STRESS-RELIEF CUFF TO IMPROVE URINE LEAKAGE AFTER ARTIFICIAL URINARY SPHINCTER IMPLANTATION**
Weibl P, Ameli G, Rutkowski M, Huebner W A

12:40 **105 EFFECT OF PELVIC FLOOR RELAXING VOIDING POSITION ON UROFLOWMETRY IN MEN WITH LOWER URINARY TRACT SYMPTOMS DUE TO BENIGN PROSTATIC HYPERPLASIA.**
Viseshsindh W, Sarawong S, Sirisreetreerux P, Pummangura W

12:45 **106 THE LONG-TERM SYMPTOMATIC OUTCOME AFTER TRANSURETHRAL RESECTION OF THE PROSTATE (TURP): RETROSPECTIVE ANALYSIS DEPENDING ON THE URODYNAMIC PARAMETERS BEFORE TURP**
Wada N, Hori J, Tamaki G, Kita M, Kakizaki H

12:05 **107 RELATIONSHIP OF NOCTURNAL POLYURIA AND COMBINATION ANTI-HYPERTENSIVE DRUG THERAPY**
Epstein M, Thomas M, Victor R, Weiss J P

12:10 **108 CERNITIN POLLEN EXTRACT CAN IMPROVE OVERACTIVE BLADDER CONDITION IN A RAT MODEL OF NON-BACTERIAL PROSTATITIS IN SHORT TERM.**
Naoyuki Y, Kenichi M, Shinsuke M, Hiromitsu M

12:15 **109 ARE POOR RESPONSE AND ADVERSE EVENTS PREDICTABLE FOLLOWING BOTULINUM TOXIN-A INJECTIONS FOR REFRACTORY IDIOPATHIC OVERACTIVE BLADDER?**
Abrar M M, Stroman L, Solomon E, Roberts C, Taylor C, Malde S, Sahai A

12:20 **110 PREOPERATIVE ULTRASOUND-GUIDED PELVIC FLOOR MUSCLE TRAINING FACILITATES CONTINENCE RECOVERY IN THE EARLY PHASE AFTER ROBOT ASSISTED RADICAL PROSTATECTOMY.**
Yoshida M, Matsunaga A, Fijimura T, Sato Y, Kamei J, Watanabe D, Aizawa N, Shinoda Y, Haga N, Kume H, Igawa Y, Sanada H

12:25 **111 VESOMNI IMPROVES QUALITY OF LIFE IN MEN WITH LOWER URINARY TRACT SYMPTOMS IN ROUTINE CLINICAL PRACTICE IN EUROPE**
Foley S, Huang M, Rosa Arias J, Skoumal R, Walters C, Yavuz Y, De Wachter S G, Rees J

12:30 **112 RESPONDER ANALYSIS - A NEW METHOD TO DOCUMENT A CLINICALLY MEANINGFUL TREATMENT BENEFIT IN NOCTURIA**
Weiss J P, Malmberg A, Andersson F

12:35 **113 WHY DO PEOPLE VOID AT NIGHT**
Weiss J P, Blaivas J, De Rosa P, Dayan L, Smith M

12:40 **114 IMIDAFENACIN MEDIATES NOCTURNAL ANTIDIURESIS THROUGH CONCENTRATION OF URINE OSMOLALITY**
Hashimoto M, Shimizu N, Ohzeki T, Minami T, Nozawa M, Yoshimura K, Uemura H, Tahara H, Hirayama A

12:45 **115 NOCTURIA INDUCED BY THE RESTRAINT STRESS IS INVOLVED WITH ALTERNATION OF CIRCADIAN GENE EXPRESSION IN THE MOUSE BLADDER.**
Ihara T, Mitsui T, Tuschiya S, Kanda M, Kira S, Nakagomi H, Sawada N, Yoshiyama M, Takeda M

12:50 **116 SHORT-TERM RETROSPECTIVE ANALYSIS OF VOIDING DIARY OF PATIENTS WITH NON-UROLOGICAL CANCER REFERRED TO UROLOGIST FOR NEW-ONSET NOCTURIA AFTER SURGERY**
Kim S H, Joung J Y, Ho Kyung Seo H K

12:55 **117 EFFECTS AND SAFETIES OF DESMOPRESSIN ON NOCTURIA IN ELDERLY MEN**
Luo Z, Xie K

12:05 **118 THE IMPACT OF NOCTURIA ON PATIENT REPORTED SLEEP QUALITY**
Romano C, Lewis S, Barrett A, Andersson F

12:10 **119 DOES SUCCESSFUL TREATMENT OF URINARY URGENCY IMPROVE COMORBIDITIES IN PATIENTS WITH NOCTURIA?**
Chin K S, Rose G E, Ervin C F, Ong T J, Whishaw D M, Bower W F

12:15 **120 CHRONIC ISCHEMIA CAUSES UROPLAKIN DEFECT IN RAT URINARY BLADDER MUCOSA**
Akaihata H, Onagi A, Ryo T, Ruriko H, Junya H, Masao K, Ogawa S, Haga N, Hosoi T, Ishibasi K, Aikawa K, Kojima Y

12:20 **121 URINARY MONOCYTE CHEMOATTRACTANT PROTEIN-1 (MCP-1) EXPRESSION, QUALITY OF LIFE AND SEVERITY OF SYMPTOMS IN PATIENT WITH OVERACTIVE BLADDER (OAB) IN RESPONSE TO SUCCESSFUL TREATMENT**
Farhan B, Ghoniem G, Zaldivar F

12:25 **122 THE MANAGEMENT OF OVERACTIVE BLADDER IN DAILY PRACTICE IN TURKEY: TURKISH CONTINENCE SOCIETY MULTICENTRIC STUDY**
Zümrütbas A E, Çitgez S, Acar Ö, Izol V, Uzun H, Kabay S, Sancak E B, Yazici C, Erdogan M S, Tarcan T, Demirkesen O

12:30 **123 UROTHELIAL MAXIK POTASSIUM CHANNEL REGULATES OVERALL BLADDER METABOLISM: A FACTOR IN DIABETIC BLADDER DISEASE.**
Davies K, Wang Y

12:35 **124 PELVIC IRRADIATION INDUCES TWO BLADDER PHENOTYPES WHICH ARE DICHOTOMIZED AT THE 10 PERCENT VOIDING EFFICIENCY THRESHOLD – SMALL CAPACITY END STAGE OVERACTIVE BLADDER AND LARGE CAPACITY UNDERACTIVE BLADDER**
Dobberfuhl A D, Briggs M A, Wen Y, Diaz E C, Graves E E, Ning S, Knox S J, Chen B

12:40 **125 DOES INCORPORATION OF AN OVERACTIVE BLADDER CARE PATHWAY IMPROVE FOLLOWUP AND PROGRESSION TO THIRD LINE THERAPIES?**
Du C, Berg W, Wang Y, Kapadia K, Huang Z, Nguyen A, Cheung A, Weissbart S, Kim J

12:05 **126 LONG-TIME CHANGE OF SYMPTOMS SEVERITY AND SYMPTOM-SPECIFIC BOTHER IN TREATMENT OF FEMALE OVERACTIVE BLADDER (OAB) PATIENTS**
Fujihara A, Fukui A, Saito Y, Ushijima S, Ukimura O

12:10 **127 SAFETY AND TOLERABILITY OF OVERACTIVE BLADDER TREATMENTS USING A LARGE INTEGRATED DATABASE OF MIRABEGRON CLINICAL STUDIES INVOLVING >10,000 OVERACTIVE BLADDER PATIENTS**
Chapple C R, Cruz F, Heesakkers J P F A, Cardozo L, Milsom I, Wagg A, Staskin D, Herschorn S, Stoelzel M, Schermer C R, Siddiqui E

12:15 **128 NLRP3/IL-1B MEDIATES CHANGES IN UROTHELIAL MUSCARINIC RECEPTORS M2 AND M3 DURING BLADDER OUTLET OBSTRUCTION IN RATS**
Hughes F, Jett A, Pines S, Tolbert S, Jin H, Purves T

12:20 **129 THE IMPACT OF OVARY HORMONE DEFICIENCY ON HIGH FAT AND HIGH SUGAR DIET - INDUCED OVERACTIVE BLADDER IN A RAT MODEL**
Juan Y, Chuang S, Lu J, Long C, Lin K, Wu W, Lee Y, Chen S

12:25 **130 GENDER DIFFERENCE IN THE ASSOCIATION BETWEEN OBESITY AND URINARY URGENCY. FINDINGS FROM ANALYSIS OF 2,568 HEALTHY YOUNG AND MIDDLE-AGED ADULTS.**
Kiuchi H, Inagaki Y, Ueda N, Fukuhara S, Miyagawa Y, Takezawa K, Takao T, Tsujimura A, Nonomura N

12:30 **131 ONABOTULINUMTOXINA RETREATMENT NOT ASSOCIATED WITH AN INCREASED RISK OF CLEAN INTERMITTENT CATHETERIZATION IN PATIENTS WITH IDIOPATHIC OVERACTIVE BLADDER: POOLED ANALYSIS OF RANDOMIZED CONTROLLED TRIALS**
Rovner E, Cruz F, Sobol J, McCammon K, Hamid R, Radomski S, Orejudos A, Patel A, Lemack G

12:35 **132 VALIDATION OF A 3-DAY ELECTRONIC BLADDER DIARY AS AN APP FOR SMART-PHONE**
Mateu Arrom L, Peri L, López-Fando Lavalle L, Franco A, Jiménez-Cidre M A, Alcaraz A

12:40 **133 WATER AVOIDANCE STRESS INDUCED BLADDER OVERACTIVITY IN MICE IS ASSOCIATED WITH ENHANCED CONTRACTILE BLADDER RESPONSES**
West E G, Sellers D, Chess-Williams R, McDermott C

12:45 **134 URINARY ATP CONCENTRATION IS DEPENDENT ON THE TIME SINCE THE PREVIOUS VOID AND NOT DILUTION.**
McLatchie L, Dasgupta P, Fry C H, Sahai A

12:50 **135 PROSPECTIVE STUDY TO EVALUATE QUALITY OF LIFE WITH PERCUTANEOUS TIBIAL NEUROMODULATION IN DRUG-NAÏVE PATIENTS WITH OVERACTIVE BLADDER SYNDROME**
Kobashi K, Margolis E, Sand P, Siegel S, Khandwala S, Newman D K, Nitti V, MacDiarmid S, Michaud E, Kan F

12:55 **136 CAN INTRAVESICAL ONABOTULINUMTOXINA INJECTIONS TRIGGER CARDIAC ARRHYTHMIA?**
Miotla P, Olejniczak P, Futyma K, Wrobel A, Tomaszewski M, Bogusiewicz M, Wawrysiuk S, Rechberger T

12:05 **137 "INCREMENTAL SYRINGE" A NOVEL INVENTION OF A USER FRIENDLY SYRINGE TO INJECT BOTULINUM TOXIN WITH IMPROVED ACCURACY, PRECISION, AND SPEED**
Mirzazadeh M, Gillispey G, Russell K, Brown P

12:10 **138 WHAT'S NORMAL? SHOULD URINARY CREATININE OR OSMOLARITY BE USED TO NORMALISE URINARY PROTEIN MEASUREMENTS?**
Ognenovska S, Cheng Y, Li A, Mansfield K J, Moore K H

12:15 **139 UROLOGIST´S PERSPECTIVE ABOUT FACTORS THAT AFFECT TREATMENT ADHERENCE IN OVERACTIVE BLADDER SYNDROME. IS IT POSSIBLE TO CHANGE?**
Muller-Arteaga C, Adot-Zurbano J M, Esteban-Fuertes M, Cozar-Olmo J M

12:20 **140 BLEBBISTATIN REVEALS BENEFICIAL EFFECT ON THE CYSTOMETRIC PARAMETERS IN THE ANIMAL MODEL OF THE DETRUSOR OVERACTIVITY**
Wróbel A, Nowakowski L, Rechberger E, Banczerowska-Górska M, Gogacz M, Semczuk A, Poleszak E, Dudka J, Rechberger T

12:25 **141 EFFICACY AND SAFETY OF TAMSULOSIN AND MIRABEGRON COMBINATION TREATMENT IN WOMEN PATIENTS WITH DETRUSOR OVERACTIVITY AND IMPAIRED CONTRACTILITY**
Oh C Y, Lee S H, Cho S T, Kim Y H, Lee G W, Bae J H, Yoon H, Shin D G, Kim J H

12:30 **142 SAFETY, EFFICACY AND PERSISTENCE FOLLOWING DAILY MIRABEGRON USE FOR OVERACTIVE BLADDER: 3-YEAR RESULTS FROM A JAPANESE POST-MARKETING SURVEILLANCE STUDY**
Kato D, Tabuchi H, Uno S

12:35 **143 PILOT STUDY EVALUATING THE EFFECTS OF TRANSCUTANEOUS TIBIAL NERVE STIMULATION ON URINARY SYMPTOMS IN FEMALE PATIENTS WITH MULTIPLE SCLEROSIS REPORTING OVERACTIVE BLADDER**
Polat C, Tulek Z, Kurtuncu M, Gunduz T, Panicker J N, Eraksoy M

12:40 **144 A NOVEL AND ORIGINAL METHOD TO TARGET THE BLADDER TRIGONE WITH TRANSVAGINAL ULTRASOUND INJECTION UNDER TRANSABDOMINAL CYSTOSCOPIC GUIDANCE – TECHNICAL PROOF OF FEASIBILITY STUDY IN THE CADAVER**
Syan R, Olivas J C, Comiter C V, Srivastava S, Dobberfuhl A D

12:45 **145 PREDICTORS OF POOR RESPONSE PARAMETERS TO INTRADETRUSOR BOTULINUM TOXIN-A INJECTIONS IN PATIENTS WITH IDIOPATHIC OVERACTIVE BLADDER**
Shamout S, Bouchard B, Kabbara H, Corcos J, Campeau L

12:50 **146 TRENDS IN THE MANAGEMENT OF OVERACTIVE BLADDER IN THE UNITED STATES FROM 2003-2015**
Syan R, Zhang C, Enemchukwu E

12:55 **147 BENEFIT-RISK EVALUATION OF TOLTERODINE (4 MG) AND FESOTERODINE (FIXED AND FLEXIBLE DOSING): USING MULTI-CRITERIA DECISION ANALYSIS MODELLING TO HELP PHYSICIANS OPTIMISE TREATMENT IN PATIENTS DIAGNOSED WITH OVERACTIVE BLADDER**
Chapple C R, Phillips L, Pawinski R, Mauer J, Lizarraga I, Chaudhuri S

12:05 **148 5 YEARS' EXPERIENCE OF HIGH ADHERENCE RATE OF MIRABEGRON AND ITS COMBINED PHARMACOTHERAPIES IN PATIENTS WITH OVERACTIVE BLADDER IN JAPAN**
Takeda M, Uchiyama H, Mitsui T, Hiraoka M, Matsuda Y, Sawada N, Kira S, Ihara T, Nakagomi H, Imai Y

12:10 **149 THE INCIDENCE OF DE NOVO OVERACTIVE BLADDER AFTER MILLIGAN MORGAN HEMORRHOIDECTOMY**
Tursunkulov A, Alidjanov N, Muhamed-Aliev A, Ibragimov A, Rakhmatov A

12:15 **150 SUCCINATE INDUCES RELAXATION OF MURINE BLADDERS IN-VIVO AND EX-VIVO**
Mossa A H, Velasquez Flores M, Cammisotto P, Campeau L

12:20 **151 SYMPTOM RELIEF FROM OAB: WHAT AN"AVERAGE" PATIENT MIGHT EXPECT: DATA FROM A POOLED ANALYSIS OF FESOTERODINE TREATED PATIENTS**
LaBossiere J R, Fernet M, Herschorn S, Carlsson M, Oelke M, Wagg A

12:25 **152 HOW COMMON ARE ADVERSE EVENTS IN PATIENTS WITH EITHER A 50 OR 100% RESOLUTION OF OAB SYMPTOMS DURING TREATMENT WITH FESOTERODINE?**
Wagg A, LaBossiere J R, Oelke M, Fernet M, Carlsson M, Herschorn S

12:30 **153 FACTORS AFFECTING CHILDREN'S DUI IN MAINLAND CHINA AND ITS RELATIONSHIP WITH DISPOSABLE DIAPER USE**
Wen J G, Xu P C, Wen Y B, Wang X Z, Wang Y H, Li Z Z, Shang X P, Wang Q W, Chen Y, He Y L, Jorgensen C, Rittig S

12:35 **154 A PATIENT-REPORTED, NON-INTERVENTIONAL, CROSS-SECTIONAL DISCRETE CHOICE EXPERIMENT TO DETERMINE TREATMENT ATTRIBUTE PREFERENCES IN TREATMENT-NAÏVE OVERACTIVE BLADDER PATIENTS IN THE US**
Athavale A, Gooch K, Walker D, Suh M, Scaife J, Haber A, Hadker N, Dmochowski R

12:40 **155 SAFETY AND EFFICACY OF ONABOTULINUMTOXINA INJECTIONS IN OCTO AND NONAGENARIANS**
Zahner P M, Giusto L L, Lloyd J C, Guzman-Negron J M, Agrawal S, Moore C K, Rackley R R, Vasavada S P, Goldman H B

12:45 **156 SAFETY AND EFFICACY OF ONABOTULINUMTOXINA INJECTIONS IN THE SETTING OF SUPRAPUBIC CATHETERS**
Giusto L L, Zahner P M, Lloyd J C, Guzman-Negron J M, Agrawal S, Moore C K, Rackley R R, Vasavada S P, Goldman H B

12:50 **157 COMPARISON OF 6 MONTHS OUTCOMES AND SIDE EFFECTS OF SACRAL NERVE STIMULATION AND BOTOX-A INJECTION IN WOMEN WITH REFRACTORY OVERACTIVE BLADDER A SYSTEMATIC REVIEW AND META-ANALYSIS**
Zeng X, Sheng H, Luo D

12:05 **158 EFFECTS OF DISPOSABLE DIAPER USAGE ON DEFECATION DYSFUNCTION IN CHILDREN AGED 2 TO 6 YEARS: A RETROSPECTIVE EPIDEMIOLOGICAL STUDY**
Zhou W, Li S, Wen J G, Wang H, Chen J, Liu X, Jiang J, Li W, Sun F, Diao H, Yao F

12:10 **159 OBESITY AND HIGH-RISK PROSTATE CANCER AS RISK FACTORS FOR SEVERE URINARY INCONTINENCE AFTER ROBOT-ASSISTED RADICAL PROSTATECTOMY**
Tanji R, Haga N, Onagi A, Honda R, Hoshi S, Hata J, Sato Y, Akaihata H, Kataoka M, Ogawa S, Ishibashi K, Kojima Y

12:15 **160 CHARACTERISTICS OF 5-A-REDUCTASE-INHIBITOR-INDUCED PROSTATE VOLUME REDUCTIONS**
Jong-hyun Y, Changho L, Seung Whan D, Ki Hong K, Hee Jo Y, Doo Sang K, Yun Soo J

12:20 **161 TRANSIENT STRESS URINARY INCONTINENCE (SUI) POST HOLMIUM LASER ENUCLEATION OF THE PROSTATE (HOLEP)**
Guo J, Teplitsky S, Syed A, Shenot P J, Das A

12:25 **162 INFLUENCE OF NERVE-SPARING PROCEDURE ON LOWER URINARY TRACT SYMPTOMS AFTER ROBOT-ASSISTED RADICAL PROSTATECTOMY**
Honda M, Tsounapi P, Kimura Y, Kawamoto B, Morizane S, Hikita K, Saito M, Takenaka A

12:30 **163 DORSAL ONLAY BUCCAL MUCOSA URETHROPLASTY FOR FEMALE STRICTURE: A SINGLE-CENTER SERIES**
Peyronnet B, Sussman R, Malacarne D, Palmerola R, Granieri M, Zhao L, Rosenblum N, Nitti V, Brucker B M

12:35 **164 DECREASED SEXUAL FUNCTION AFTER SACHSE URETHROTOMY, REGARDLESS OF THE USE OF CLEAN INTERMITTENT CATHERIZATION**
Westgeest M, Goosen E E C, van Balken M R

12:40 **165 MANAGEMENT AND OUTCOMES OF URETHROVAGINAL FISTULA REPAIR**
Barratt R, Kotes S, Pakzad M H, Hamid R, Ockrim J L, Greenwell T J

12:45 **166 IS THERE A ROLE FOR SURGICAL TREATMENT IN PATIENTS WITH PARKINSON'S DISEASE AND BENIGN PROSTATIC OBSTRUCTION?**
Peyronnet B, Vurture G, Vanalderwerelt V, Tariel F, Huet R, Pradere B, Vincendeau S, Bruyere F, Mathieu R, Nitti V, Brucker B M

12:50 **167 IS THERE A ROLE FOR CONCOMITANT PUBOVAGINAL SLING AT THE TIME OF MIDURETHRAL SLING EXCISION FOR EROSION OR EXPOSURE?**
Peyronnet B, Syan R, Enemchukwu E, Drain A, Mendhiratta N, Glass D, Sussman R, Palmerola R, Malacarne D, Rosenblum N, Nitti V, Brucker B M

12:05 **168 THE STRUCTURE AND MANAGEMENT OF A URODYNAMIC DATABASE**
Gammie A, Thomas L, Hashim H, Abrams P

12:10 **169 DR. WHY I AM STILL NOT DRY {URODYNAMIC CHANGES AFTER SUCCESSFUL VVF REPAIR}.**
Abdullah A, Javed A, Memon I

12:15 **170 ELDERLY PATIENTS WITH BLADDER OUTLET OBSTRUCTION AND ASSOCIATED NEUROLOGICAL COMORBIDITIES: CAN URODYNAMICS BE OF HELP IN SELECTING PATIENTS FOR SURGERY.**
Abulseoud A, Ali G

12:20 **171 CONDOM CATHETER TEST REVISITED: A MODIFIED PROTOTYPE FOR NON-INVASIVE MEASUREMENT OF ISOVOLUMETRIC BLADDER PRESSURE.**
Hassouna M, Shoukry M

12:25 **172 MODIFIED CONDOM CATHETER TEST FOR NON-INVASIVE MEASUREMENT OF ISOVOLUMETRIC BLADDER PRESSURE IN OBSTRUCTED MALE PATIENTS: A PILOT STUDY.**
Hassouna M, Shoukry M, Elmissiry M, Moussa A, Elkhawalka M

12:30 **173 THE SEROTONIN (5-HT)2A AND 5-HT2C RECEPTORS ARE UP-REGULATED IN ONUF'S NUCLEUS IN RATS WITH DIABETES MELLITUS**
Cao N, Gu B

12:35 **174 VALSALVA´S MANEUVER IN OBSTRUCTED MEN DO NOT IMPROVE QMAX AS IT WAS THOUGHT**
Cobreros C, Del Villar M, Sarotto N, Garcia Penela E, Bechara A, Rey H

12:40 **175 A NOVEL MOBILE UROFLOWMETRY APPLICATION FOR ASSESSING LOW URINARY TRACT SYMPTOMS**
Comiter C V, Belotserkovsky E

12:05 **176 TRANSFER OF KULKARNI'S ONE-STAGE DOUBLE BUCCAL MUCOSA URETHROPLASTY TECHNIQUE FROM ITS ORIGIN TO A TERTIARY CARE CENTER**
Zümrütbas A E, Özlülerden Y, Çelen S, Aybek Z

12:10 **177 RELATIONSHIP BETWEEN ADRB3, ARHGEF10 AND ROCK2 GENE POLYMORPHISMS AND CLINICAL FINDINGS IN OVER ACTIVE BLADDER PATIENTS**
Firat E, Aybek Z, Akgün S, Küçüker K, Akça H, Aybek H

12:15 **178 THE URODYNAMIC FINDINGS IN MEN AND WOMEN WITH DETRUSOR UNDER ACTIVITY**
Axell R G, Kocadag H, Trimboli M, Yasmin H, Duffy M, Pakzad M H, Hamid R, Ockrim J L, Greenwell T J

12:20 **179 THE AETIOLOGY OF DETRUSOR UNDERACTIVITY**
Kocadag H, Trimboli M, Axell R G, Pakzad M H, Hamid R, Ockrim J L, Greenwell T J

12:25 **180 COMPARISON OF REAL-TIME BLADDER SENSATION IN NON-INVASIVE ACCELERATED HYDRATION AND URODYNAMICS IN INDIVIDUALS WITHOUT URINARY URGENCY**
Nagle A S, Grochulski M, Naimi H A, Vinod N, Kolli H, Sheen D, Balthazar A, Speich J E, Klausner A

12:30 **181 CYSTOMETRY -ICS STANDARD- SENSATION VOLUMES ARE LOWER AND PRESSURES AT SENSATION LANDMARKS ARE HIGHER IN ASSOCIATION WITH INCREASING URODYNAMIC GRADE OF BLADDER OUTFLOW OBSTRUCTION DURING VOIDING, IN MEN AS WELL AS IN IN WOMEN.**
Rosier P F W M

12:35 **182 IMPACT OF AUA URODYNAMICS GUIDELINES ON PRACTICE PATTERNS IN THE UNITED STATES**
Rourke E, Meeks W, Pichardo D, Kraus S

12:40 **183 INTUBATED FLOW IN MEN MUST BE COMPARED TO FREE FLOW TO AVOID OVERESTIMATING THE DIAGNOSIS OF BLADDER OUTLET OBSTRUCTION**
Valentini F, Rosier P F W M, Zimmern P, Nelson P

12:45 **184 RETROGRADE LEAK POINT PRESSURE DOES NOT PREDICT OUTCOMES FOLLOWING MALE SLING INSERTION**
Toia B, Jeth J, Ecclestone H, Pakzad M H, Hamid R, Greenwell T J, Ockrim J L

12:50 **185 CLINICAL AND URODYNAMIC FINDINGS IN WOMEN WITH DETRUSOR OVERACTIVITY**
Turner-Llaguno A L, Rodríguez-Colorado S, Ramírez-Isarraraz C, Granados-Martínez V, Gorbea-Chávez V

12:00 - 14:00 **ICS BOARD OF TRUSTEES & COMMITTEE CHAIRS**
Chair: Prof Sherif Mourad (Egypt)Members: Prof David Castro-Diaz (Spain), Prof Mauro Cervigni (Italy), Prof Carlos Levi D'Ancona (Brazil), Dr Alex Digesu (United Kingdom), Mr Marcus John Drake (United Kingdom), Dr Jerzy B Gajewski (Canada), Dr Alex Tong-Long Lin (Taiwan), Prof Cristina Naranjo Ortiz (Spain)Committee Members: Dr Giovanni Mosiello (Italy), Dr Elise Jaques Billings De (United States), Prof Sakineh Hajebrahimi (Iran), Dr Nina Sarah Davis (United States), Prof Emmanuel Jean Chartier-Kastler (France), Prof Donna Zimmaro Bliss (United States), Prof Doreen McClurg (United Kingdom), Ms Jacqueline Cahill (Canada), Prof Bernard T Haylen (Australia), Enrico Finazzi Agrò (Italy)

13:00 - 14:00 **RT1: NATIONAL INSTITUTES OF HEALTH: INNOVATION IN LUTS CLINICAL RESEARCH NETWORKS**
Chair: Tamara Bavendam (United States)Speakers: Kevin Weinfurt (United States), Jason Kutch (United States), Prof Holly E Richter (United States), Prof Jeni Hebert-Beirne (United States)

14:00 - 14:05 **BREAK TO CHANGE HALLS**

14:05 - 15:35 **SESSION 8 (PODIUM SHORT ORAL) - URODYNAMICS**
Chairs: Prof Paul Abrams (United Kingdom), Dr Timothy B McKinney (United States), Dr Mikel Gray (United States)

14:05 **186 URODYNAMIC STRATIFICATION OF ELDERLY MALE PATIENTS WITH SYMPTOMS OF LOWER URINARY TRACT DYSFUNCTION; A MEDICAL SEPECIALISTS GRADING AND STAGING OF DISEASE.**
Rosier P F W M

14:12 **187 A NONINVASIVE UROFLOWMETER-CYSTOMETER (NUC), WHICH CAN MEASURE DETRUSOR PRESSURE AND IDENTIFY BOO WITHOUT USING A CATHETER**
Mooreville M, Meller A, Generotti C, Kron R

14:20 **188 AUTOMATED QUANTIFICATION OF LOW AMPLITUDE RHYTHMIC CONTRACTIONS DURING URODYNAMICS IDENTIFIES INCREASING AMPLITUDE BUT NOT FREQUENCY WITH INCREASING VOLUME IN A SUBGROUP OF PATIENTS WITH DETRUSOR OVERACTIVITY**
Cullingsworth Z, Klausner A, Speich J E

14:27 **189 IMPACT OF DIFFERENT SIZED CATHETERS ON UROFLOWMETRY AND PRESSURE FLOW STUDY IN ADULT MEN: A PROSPECTIVE RANDOMIZED STUDY**
Kumar N, Patel M, Vasudeva P, Madersbacher H, Schafer W

14:35 **190 COMPARISON OF THE TECHNICAL QUALITY OF URODYNAMIC GRAPHS ACQUIRED VIA GOOGLE SEARCH ENGINE ON THE INTERNET WITH GRAPHS ACQUIRED VIA PUBMED.**
Rosier P F W M

14:42 **191 URINE FLOW RATE SHAPE TEMPLATE AND INTERMITTENT FLOW IN MALES**
Li R, Gammie A, Zhu Q, Nibouche M

14:50 **192 TECHNICAL PERFORMANCE OF THE 5 FRENCH T-DOC® AIR-CHARGED CATHETER FOR URODYNAMIC STUDIES**
Smith M, Ciolfi V, Couri B M, Gallone S, Bhardwaj D

14:57 **193 INCIDENCE AND PREDICTORS OF POSITIVE URINE CULTURE AND URINARY TRACT INFECTIONS AFTER URODYNAMICS. GETTING INTO THE ANTIBIOTIC PROPHYLAXIS DILEMMA.**
Zubieta M E, Gonzalez M I, Jaunarena J H, Favre G A, Tejerizo J C

15:05 **194 FLOW RESISTIVE FORCES INDEX (QRF): A NOVEL APPROACH FOR IMPROVING THE DIAGNOSTIC ACCURACY OF UROFLOW TEST.**
Spyropoulos E

15:12 **195 COMPARISON OF URINARY TRACT INFECTION INCIDENCES AFTER URODYNAMIC EXAMINATION WITH OR WITHOUT PRIOR ANTIBIOTHERAPY OF ASYMPTOMATIC BACTERIURIA**
Michol L, Grilo N, Denys P, Schurch B

15:20 **196 PRE-OPERATIVE URODYNAMIC EVALUATION IN FEMALE MEDICARE PATIENTS UNDERGOING A STRESS URINARY INCONTINENCE PROCEDURE: RATES BEFORE AND AFTER THE VALUE TRIAL**
Vollstedt A, Moses R, Gormley E A

15:27 **197 USE OF THE VBN MATHEMATICAL MODEL TO ACCOUNT FOR VOIDS IN WOMEN WITH HIGH FLOW RATE AND LOW DETRUSOR PRESSURE**
Valentini F, Marti B, Nelson P

14:05 - 15:35

SESSION 9 (PODIUM SHORT ORAL) - PRODUCTS

Chairs: Dr Kathleen Frances Hunter (Canada), Brian Murray (United States), Prof Emmanuel Jean Chartier-Kastler (France)

14:05 **198 PRIZE AWARD: BEST IN CATEGORY PRIZE: DEVELOPMENT AND EVALUATION OF A CONTINENCE PRODUCT DECISION AID FOR PRODUCT USERS AND CLINICIANS**
Cathy M, Christine d L, Elizabeth C, Macaulay M, Mandy F

14:12 **199 INTERMITTENT CATHETER CHOICE IMPACTS QUALITY OF LIFE: CLINICAL STUDY ON SAFETY AND PREFERENCE OF SINGLE VS. REUSE CATHETERS.**
Newman D K, O'Connor R C, Clark R, Heriseanu R, Chung E, New P, Lee B

14:20 **200 POST-ACUTE CARE URINARY DIARY: FEASIBILITY AND ACCEPTABILITY ASSESSMENT**
Krabbenhoft L, Schulz P, Wilde M, Zimmerman L, Kupzyk K, Deibert C

14:27 **201 PERCEPTION OF INTERMITTENT SELF-CATHETERIZATION BY UROLOGISTS: PRELIMINARY RESULTS OF A SURVEY AMONG THE FRENCH ASSOCIATION OF UROLOGY**
Hervé F, Phé V, Mallet R, Gamé X, Everaert K

14:35 **202 PREFERENCES FOR CONTINENCE CARE AT END OF LIFE: A QUALITATIVE STUDY**
Smith N, Hunter K F, Rajabali S, Fainsinger R, Wagg A

14:42 **203 ACCURACY OF PAD COUNT IN THE ASSESSMENT OF URINARY INCONTINENCE SEVERITY: EVIDENCES FROM A LARGE-SCALE MULTICENTER PAD TEST STUDY**
Sacco E, Bientinesi R, Gandi C, Pierconti F, Bassi P

14:50 **204 CONTAINMENT PRODUCTS AND QUALITY OF LIFE IN MEN WITH LIGHT TO MODERATE URINARY INCONTINENCE: AN EXPLORATORY ANALYSIS.**
Rajabali S, McCreary M, Gartner S, Hunter K F, Lindeman C, Wagg A

14:57 **205 SEXUAL FUNCTION IN WOMEN WITH MULTIPLE SCLEROSIS, WHO RECEIVE TREATMENT WITH CLEAN INTERMITTENT SELF-CATHETERIZATIONS. PRELIMINARY RESULTS.**
Samarinas M, Konstantinidis C, Kalogiannis D, Bousdroukis N, Oeconomou A, Skriapas K

15:05 **206 DUTCH TRANSLATION AND VALIDATION OF 4 QUESTIONNAIRES IN ORDER TO EVALUATE INTERMITTENT SELF CATHETERIZATION IN PATIENTS WITH NEUROGENIC BLADDER: INCASAQ (INTERMITTENT CATHETERIZATION SATISFACTION QUESTIONNAIRE), ICAT (INTERMITTENT CATHETERIZATION ACCEPTANCE TEST), ICSQ (INTERMITTENT SELF CATHETERIZATION QUESTIONNAIRE) AND ICDQ (INTERMITTENT CATHETERIZATION DIFFICULTY QUESTIONNAIRE)**
Hervé F, Amarenco G, Guinet-Lacoste A, Spinoit A, Denys M, Ragolle I, Bonniaud V, Everaert K

15:12 **207 RELATED FACTORS OF INCONTINENCE AND CONTINENCE MANAGEMENT STRATEGIES AMONG THE ELDERLY OF LONG-TERM CARE FACILITIES IN TAIWAN**
Tsai C H, Chang J, Sung Y P

15:20 **208 A NOVEL MOBILE ACOUSTIC UROFLOWMETRY: COMPARISON OF UROFLOWMETRY AND MOBILE ACOUSTIC UROFLOWMETRY**
Young Ju L, Jeeyoung S, Jiyoung J, Min-Ho S, Hansol C, Sang-chul L

15:27 **209 ULTRASOUND EVALUATION OF THE INFLUENCE OF CUBE PESSARIES ON FEMALE'S PELVIC FLOOR**
Wlazlak E, Kociszewski J, Krzycka M, Wlazlak W, Dunicz A, Surkont G

14:05 - 15:35

SESSION 10 (PODIUM SHORT ORAL) - FEMALE LOWER URINARY TRACT SYMPTOMS / VOIDING DYSFUNCTION

Chairs: Prof Nucelio L B M Lemos (Canada), Dr Pamela A. Moalli (United States)

14:05 **210 THE PREVALENCE OF HYPOVITAMINOSIS D IN WOMEN WITH URINARY SYMPTOMS.**
Lordelo P, Lemos A, Barros R, Teles A, Matos Y C C, Luso A, Brasil C

14:12 **211 "HOLD TILL YOU BUST": A QUALITATIVE EXPLORATION OF NURSES' EXPERIENCES OF URINARY SYMPTOMS IN THE WORKPLACE.**
Pierce H, Perry L, Gallagher R, Chiarelli P

14:20 **212 HIGH INCIDENCE OF VOIDING DYSFUNCTION IN WOMEN WITH RECURRENT URINARY TRACT INFECTION**
Lee P, Lee Y, Lee C, Kuo H

14:27 **213 ARE SOLIFENACIN AND MIRABEGRON EFFECTIVE IN DECREASING UNDESIRED URGENCY AFTER MID-URETHRAL SLING SURGERIES?**
Rechberger T, Wrobel A, Zietek A, Rechberger E, Bogusiewicz M, Kulik-Rechberger B, Miotla P

14:35 **214 THERAPY OF URGENCY URINARY INCONTINENCE IN WOMEN - A RANDOMIZED CLINICAL TRIAL TO COMPARE THE EFFECT OF SOLIFENACIN WITH THE STANDARDIZED BILATERAL REPLACEMENT OF THE UTEROSACRAL LIGAMENTS**
Ludwig S, Jäger W, Mallmann P

14:42 **215 TRANSURETHRAL INCISION OF THE BLADDER NECK ON FEMALE BLADDER NECK DYSFUNCTION – LONG-TERM RESULTS AND PREDICTIVE FACTOR IN PATIENTS WITH DETRUSOR UNDERACTIVITY**
Peng C, Lee C, Lee P, Kuo H

14:50 **216 BLADDER CONTRACTILITY INDEX IN WOMEN: A CHANGE IN VALUE ?**
Gopi S S, Sandeep B, Balasubramaniam R

14:57 **217 OCCUPATIONAL GROUPS AND LOWER URINARY TRACT SYMPTOMS IN WOMEN**
Markland A, Bavendam T, Cain C, Epperson C N, LaCoursiere Y, Shoham D, Smith A, Sutcliffe S, Townsend M, Rudser K, For the PLUS Consortium

15:05 **218 ENDURING IMPACT OF CHILDHOOD ADVERSITY ON LUTS IN ADULT WOMEN**
Epperson C N, McGeehan B, Arya L, Smith A, Magno A, Stambakio H, Lipner E, Ewing G, Newman D K

15:12 **219 LOWER URINARY TRACT SYMPTOMS ARE COMMON IN WOMEN WITH FEMALE GENITAL MUTILATION**
Geynisman-Tan J, Milewski A, Dahl C, Kenton K, Lewicky-Gaupp C

15:20 **220 FEMALE PRIMARY BLADDER NECK OBSTRUCTION, REPORT OF 24 CASES, DIAGNOSIS, TREATMENT AND MANAGEMENT OF COMPLICATIONS**
Cobreros C, D'angelo A, Monica Del Villar M, Garcia Penela E, Bechara A, Rey H

15:27 **221 EXPLORATION OF LITOXETINE (LTX): A POTENTIAL NOVEL TREATMENT FOR MIXED URINARY INCONTINENCE (MUI)**
Robinson D, Crispino G

14:05 - 15:35 **W22 GENITOURINARY CANCER SURVIVORSHIP: A PRACTICAL MASTER-CLASS**
Chair: Matthew Rutman (United States), Speakers: Steven Brandes (United States), Andrew Peterson (United States), Cooper Benson (United States)

14:05 - 18:30 **17TH PHYSIOTHERAPY FORUM**
Chair: Dr Petra J. Voorham - van der Zalm (Netherlands) Speakers: Tinne Van Aggelpoel (Belgium), Mrs Hedwig Neels (Belgium), Dr Carina Marie Siracusa (United States), Prof Doreen McClurg (United Kingdom), Alexandra Vermandel (Belgium), Mrs Danielle Adriette van Reijn (Netherlands), Dr Elizabeth R Shelly (United States), Nelly Faghani (Canada), Dr Margaret Joy Sherburn (Australia), Mrs Dorien Bennink (Netherlands), Prof Cristiane Carboni (Brazil), Prof Barbara Wanda Koehler (Switzerland), Dr Sinéad Patricia Dufour (Canada), Dr Rhonda Kay Kotarinos (United States), Moheb Yani, Mrs N.D.M. Van Bergen (Netherlands), Prof Christopher R Chapple (United Kingdom)

15:35 - 16:00 **COFFEE BREAK & EXHIBITION**

16:00 - 17:30 **SESSION 11 (PODIUM SHORT ORAL) - BASIC SCIENCE: NEUROUROLOGY**
Chairs: Dr Maryrose Sullivan (United States), Prof Michel A Pontari (United States)

16:00 **222 ROLE OF P38 MITOGEN-ACTIVATED PROTEIN KINASE IN HYPEREXCITABILITY OF CAPSAICIN SENSITIVE BLADDER AFFERENT NEURONS IN MICE WITH SPINAL CORD INJURY**
Suzuki T, Shimizu T, Majima T, Shimizu N, Ni J, Mizoguchi S, Takaoka E, Miyake H, Kanai A J, Yoshimura N

16:07 **223 PRIZE AWARD: BEST IN CATEGORY PRIZE: SYMPTOMS OF DIABETIC BLADDER DYSFUNCTION MAY BE EXPLAINED BY SPECIFIC NLRP3-INDUCED CHANGES IN BLADDER AFFERENT NERVES.**
Hirshman N, Hughes F, Jin H, Purves T

16:15 **224 SILDENAFIL REDUCES PRE- AND POST-GANGLIONIC STIMULATED CONTRACTIONS IN THE MOUSE URINARY BLADDER**
Chakrabarty B, Ito H, Kanai A J, Pickering A, Drake M, Fry C H

16:22 **225 CHANGES IN EXPRESSION OF GROWTH INHIBITORY PROTEINS AT THE LUMBOSACRAL CORD ARE ASSOCIATED WITH SPROUTING OF SENSORY AFFERENTS AFTER THORACIC SPINAL CORD INJURY**
Chambel S S, Oliveira R, Schwab M, Cruz C D

16:30 **226 A NOVEL EP2 AND EP3 RECEPTOR DUAL AGONIST IMPROVES LOWER URINARY TRACT FUNCTION IN A DIABETIC RAT MODEL OF UNDERACTIVE BLADDER**
Sekido N, Kida J, Otsuki T, Okada H

16:37 **227 EXPRESSION OF HYPOXIA AND FIBROSIS RELATED GENES IN PATIENTS WITH NEUROGENIC LOWER URINARY TRACT DYSFUNCTION UNDERGOING BLADDER AUGMENTATION**
Hemerly T S, Bellucci C H S, Bessa Jr J, Barbosa J A B A, Reis S T d, Camargo G M, Bruschini H, Srougi M, Leite K R, Gomes C M

16:45 **228 THE SEX INFLUENCES METABOTROPIC GLUTAMATE RECEPTOR SUBTYPE 1 PHENOTYPE IN CONTROL OF LOWER URINARY TRACT ACTIVITY**
Yoshiyama M, Mochizuki T, Takeda M

16:52 **229 SUPRASPINAL LOWER URINARY TRACT CONTROL IN SPINAL CORD INJURY PATIENTS UNDERGOING INTRADETRUSOR ONABOTULINUMTOXINA INJECTIONS: AN MRI STUDY**
Leitner L, Walter M, Liechti M D, Michels L, Kollias S, Mehnert U, Kessler T M

17:00 **230 PATTERN OF INNERVATION AND REINNERVATION OF THE PERIURETHRAL STRIATED MUSCLE OF THE MALE RAT**
Cruz Y, Arellano J, Mirto N, Zacapa D, Munoz A, Palacios J L

17:07 **231 BLADDER DYSFUNCTION TREATMENT IN AN ANIMAL MODEL OF MULTIPLE SCLEROSIS**
Cavaleiro H, Oliveira R, Coelho A, Cruz F, Duarte Cruz C

17:15 **232 ALTERED O-GLCNACYLATION IMPAIRS NEUROTRANSMISSION IN DIABETIC BLADDERS**
Cristofaro V, Xu Y, Carew J A, Sullivan M P

17:22 **233 TIME COURSE OF URODYNAMIC FUNCTION AND THE EXPRESSION OF BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF) IN MICE WITH SPINAL CORD INJURY**
Wada N, Tsuchida M, Banjo H, Yoshimura N, Kakizaki H

16:00 - 17:30 **SESSION 12 (PODIUM SHORT ORAL) - FEMALE STRESS URINARY INCONTINENCE**
Chairs: Mr Dudley Timothy Robinson (United Kingdom), Prof Holly E Richter (United States), Prof Shlomo Raz (United States)

16:00 **234 SURGICAL TREATMENTS FOR WOMEN WITH STRESS URINARY INCONTINENCE: A NETWORK META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS**
Imamura M, Hudson J, Brazzelli M, MacLennan G, Wallace S, Javanbakht M, Moloney E, Vale L, Craig D

16:07 **235 NOVEL EXTERNAL ELECTRICAL MUSCLE STIMULATION DEVICE FOR THE TREATMENT OF FEMALE STRESS URINARY INCONTINENCE: RANDOMIZED CONTROLLED TRIAL VERSUS INTRAVAGINAL ELECTRICAL MUSCLE STIMULATION**
Dmochowski R

16:15 **236 22-YEAR POPULATION-LEVEL TRENDS IN THE SURGICAL MANAGEMENT OF FEMALE STRESS URINARY INCONTINENCE**
LaBossiere J R, Wallis C, Carr L, Saskin R, Nam R K, Herschorn S

16:22 **237 AUTOLOGOUS FASCIAL SLING FOR PRIMARY AND SECONDARY OPERATIVE TREATMENT OF STRESS URINARY INCONTINENCE : A RETROSPECTIVE CASE SERIES OVER 8 YEARS**
Watson F, Guerrero K, Pringle S, Tyagi V

16:30 **238 UNPLANNED HOSPITAL VISITS IN THE FIRST 30 DAYS FOLLOWING MIDURETHRAL SLING**
Fan Y, Chung H, Huang Y, Lin C, Lin A T

16:37 **239 THE OUTCOME OF IMPLANTATION OF A BLADDER NECK ARTIFICIAL URINARY SPHINCTER (BN AUS) FOR RECURRENT URODYNAMICALLY PROVEN STRESS AND MIXED URINARY INCONTINENCE**
Benamer D, O'Connor E, Andrich D, Ockrim J L, Greenwell T J, Mundy A

16:45 **240 EVALUATION OF SAFETY AND FUNCTIONAL OUTCOMES FOLLOWING LAPAROSCOPIC EXCISION OF MID-URETHRAL SLING MESH FOR CHRONIC PAIN**
Goodall E, Cartwright R, Stratta E, Jackson S, Price N

16:52 **241 ADJUSTABLE MINI-SLING COMPARED TO CONVENTIONAL MID-URETHRAL SLINGS IN WOMEN WITH URINARY INCONTINENCE. 3-YEAR FOLLOW-UP OF A RANDOMIZED CONTROLLED TRIAL.**
Alexandridis V, Rudnicki M, Jakobsson U, Teleman P

17:00 **242 UTILITY AND CRITICISM OF TELEMEDICINE IN UROGYNECOLOGY: A PROSPECTIVE STUDY.**
Balzarro M, Rubilotta E, Bassi S, Processali T, Pirozzi M, Soldano A, Trabacchin N, Mancini V, Costantini E, Artibani W

17:07 **243 TRANSOBTURATOR TAPE: OVER 10 YEARS FOLLOW-UP**
Natale F, Illiano E, La Penna C, Zucchi A, Costantini E

17:15 **244 LONG-TERM RESULTS IN WOMEN WITH DETRUSOR UNDERACTIVITY AND STRESS URINARY INCONTINENCE UNDERGOING SUBURETHRAL SLING: PREDICTIVE FACTORS FOR SUCCESSFUL OUTCOME**
Chen C, Yeoh S, Yeh H, Kuo H

17:22 **245 ABDOMINAL STRAINING IN UNCOMPLICATED STRESS URINARY INCONTINENCE: IS THERE A CORRELATION WITH VOIDING DYSFUNCTION AND OVERACTIVE BLADDER?**
Finazzi Agrò E, Iacovelli V, Braga A, Miano R, Serati M

16:00 - 17:30 **SESSION 13 (PODIUM SHORT ORAL) - MALE INCONTINENCE**
Chairs: Prof Carlos Levi D'Ancona (Brazil), Dr Ajay Singla (United States), Craig Comiter (United States)

16:00 **246 SEVERITY RANGES OF THE INTERNATIONAL PROSTATE SYMPTOM SCORE (IPSS); PROPOSAL TO ADJUST THE BANDING USING BASELINE DATA OF A LARGE RANDOMISED TRIAL IN SECONDARY CARE**
Ito H, Young G, Lewis A, Drake M

16:07 **247 TRANSPERINEAL ULTRASOUND MEASUREMENT OF MEMBRANOUS URETHRAL LENGTH IN MEN PRIOR TO RADICAL PROSTATECTOMY**
Mungovan S F, Luiting H B, Graham P L, Sandhu J S, Akin O, Chan L, Patel M I

16:15 **248 PRIZE AWARD: BEST IN CATEGORY PRIZE: MULTI-CHANNEL URODYNAMIC ASSESSMENT IN MEN WITH POST-PROSTATECTOMY URINARY INCONTINENCE: A COST UTILITY ANALYSIS**
Matta R, LaBossiere J R, Garbens A, Kodama R T, Nam R K, Naimark D, Herschorn S

16:22 **249 TOWARD COMPETENCY-BASED CURRICULUM IN FUNCTIONAL UROLOGY: CANADIAN CHIEF UROLOGY RESIDENTS EXPERIENCE**
Shamout S, Corcos J, Campeau L

16:30 **250 QUALITY OF LIFE IN PATIENTS WITH CHRONIC PROSTATITIS TREATED WITH ELABORATED POLYBACTERIAL VACCINE**
Lorenzo-Gómez M F, Padilla-Fernández B, Martínez-Huélamo M, Valverde-Martínez L S, Hernández-Hernández D, García-García M Á, Perán-Teruel M, García-Cenador M B

16:37 **251 PRIZE AWARD: BEST IN CATEGORY PRIZE: LOWER URINARY TRACT SYMPTOMS AFTER ARTIFICIAL URINARY SPHINCTER IMPLANTATION FOR POST-RADICAL PROSTATECTOMY URINARY INCONTINENCE AND ITS RELATION TO PREOPERATIVE URODYNAMIC PARAMETERS**
Son H S, Kim M J, Kim J H

16:45 **252 AN INDIVIDUAL PATIENT DATA META-REGRESSION FOR CONTINENCE RECOVERY FOLLOWING RADICAL PROSTATECTOMY**
Mungovan S F, Graham P L, Sandhu J S, Scardino P T, Coakley F V, Matsushita K, Ha H K, Tienza A, Choi S, Kim S C, Jeong S J, Patel M I

16:52 **253 SAFETY OF HUMAN MESENCHYMAL STEM CELLS (HMSCS) THERAPY AND THEIR SECRETOME IN POST PROSTATECTOMY INCONTINENCE WITH RESIDUAL TUMOR (IN-VITRO MODEL)**
Khalifa A O, Isali I, Shukla S, Ponsky L, Hijaz A K

17:00 **254 CONTEMPORARY TRENDS OF RADICAL PROSTATECTOMY AND PREDICTORS FOR THE RECOVERY OF URINARY CONTINENCE IN THE ELDERLY AGED OVER 70 YEARS: COMPARISONS OVER 12 YEARS WITH THE COHORT AGED 70 YEARS OR LESS**
Jeong S J, Jung J, Hwang J H, Yu Y D, Lee Y J, Kim J J, Kim J H, Lee S E

17:07 **255 THE VIRTUE EUROPEAN TRIAL FOR URINARY INCONTINENCE AFTER PROSTATECTOMY: INTERMEDIATE 1-YEAR OUTCOMES**
Madurga-Patuel B, Elzevier H, Wagner L, Hegarty P, Bottero D, Yiou R, Naumann C M, Damm J, Gutierrez Ruiz C, Everaert K, Chartier-Kastler E, Roumeguere T

17:15 **256 URODYNAMIC QUANTIFICATION BEFORE ROBOT-ASSISTED RADICAL PROSTATECTOMY TO IDENTIFY FACTORS THAT AFFECT PRE-OPERATIVE URETHRAL FUNCTION IN MALES**
Majima T, Matsukawa Y, Takai S, Funahashi Y, Kato M, Yamamoto T, Gotoh M

17:22 **257 EVALUATION OF TRANSURETHRAL RESECTION OF THE PROSTATE IN MEN WITH DETRUSOR UNDERACTIVITY: IS IT A VIABLE TREATMENT OPTION?**
Palthe S, Steffens M, Kums J, Bout C, Witte L

16:00 - 17:30 **W23 TRANSITIONING CARE; THE EVOLVING CARE OF WOMEN WITH CONGENITAL GENITOURINARY ANOMALIES**
Chair: Margaret Mueller (United States), Speakers: Kimberly Kenton (United States), Maureen Sheetz (United States), Lia Bernardi (United States)

16:00 - 18:30 **17TH PHYSIOTHERAPY FORUM - BREAK OUT ROOM**

17:45 - 18:15 **ICS TOWN HALL MEETING**
Chair: Prof Sherif Mourad (Egypt)Members: Prof David Castro-Diaz (Spain), Prof Mauro Cervigni (Italy), Prof Carlos Levi D'Ancona (Brazil), Dr Alex Digesu (United Kingdom), Mr Marcus John Drake (United Kingdom), Dr Jerzy B Gajewski (Canada), Dr Alex Tong-Long Lin (Taiwan), Prof Cristina Naranjo Ortiz (Spain)

THURSDAY 30TH AUGUST

07:30 - 08:30 **NAU EDITORIAL BOARD MEETING**

08:30 - 09:00 **SOA2: LOWER URINARY TRACT SENSATION – VOIDING WITH FEELING**
Chair: Dr Lori A Birder (United States)Speaker: Mr Jerry Gebhart (United States)

09:00 - 09:05 **BREAK TO CHANGE HALLS**

09:00 - 10:30 **SESSION 17 (PODIUM VIDEO) - SURGICAL VIDEO 1**
Chairs: Dr Elise Jaques Billings De (United States), Dr Nikolaus Veit-Rubin (Austria)

09:00 **288 PRIZE AWARD: BEST VIDEO ABSTRACT: LAPAROSCOPIC TREATMENT OF INTRAPELVIC ENTRAPMENT OF SACRAL NERVE ROOTS BY ABNORMAL PIRIFORMIS BUNDLES CAUSING SCIATICA, PUDENDAL NEURALGIA, PELVIC FLOOR DYSFUNCTION, AND LOWER URINARY TRACT SYMPTOMS**
Li A L K, Polesello G, Tokechi D, Cancelliere L, Sermer C, Lemos N

09:09 **289 ROBOT ASSISTED PUDENDAL NERVE NEUROLYSIS**
Carracedo D, Guijarro A, Moscatiello P, Sánchez M

09:18 **290 AN INTUITIVE WAY TO VISUALIZE BRAIN RESPONSE TO BLADDER FILLING**
Clarkson B, Karim H, Griffiths D J, Resnick N

09:27 **291 COMBINED LAPAROSCOPIC AND VAGINAL TECHNIQUE FOR MANAGEMENT OF TENSION-FREE VAGINAL TAPE (TVT) URETHRAL MESH EROSION AND URETHRAL RECONSTRUCTION USING MARTIUS LABIAL FLAP INTERPOSITION**
Ibrahim S, Loganathan J, Taneja S, Fayyad A

09:36 **292 A LAPAROSCOPIC APPROACH FOR EXCISION OF URETHRAL EROSION OF MIDURETHRAL POLYPROPYLENE SLING**
Stratta E, Goodall E, Cartwright R, Jackson S, Price N

09:45 **293 LAPAROSCOPICAL REMOVAL OF TRANSOBTURATOR TAPE IN PATIENTS WITH DE NOVO POSTOPERATIVE NEUROLOGICAL PAIN.**
Masata J, Svabik K, Martan A

09:54 **294 SELF-LOCKING TRANS-OBTURATOR AUTOLOGOUS FASCIA SLING FOR FEMALE STRESS URINARY INCONTINENCE**
Lin C, Fan Y, Lin A T

10:03 **295 BLADDER NECK THREADS:BNT**
Sarouphim P

10:12 **296 ROBOTIC ASSISTED SIMPLE PROSTATECTOMY VIA A POSTERIOR TRANSVESICULAR APPROACH**
Sadiq A, Sussman R, Peyronnet B, Schulster M, Stamm M, Brucker B M

10:21 **297 VICTO AND VICTO PLUS - NOVEL ALTERNATIVE FOR THE MANAGEMENT OF POSTPROSTATECTOMY INCONTINENCE. INITIAL EXPERIENCE AND SURGEON'S PERSPECTIVE**
Weibl P, Ameli G, Rutkowski M, Hoelzel R, Huebner W A

09:05 - 10:35 **NURSES FORUM**
Chair: Prof Donna Zimmaro Bliss (United States)Speakers: Dr Sandra J Engberg (United States), Ms Christine Bradway (United States), Dr Joan Ostaszkiewicz (Australia), Prof Jo Booth (United Kingdom)

09:05 - 10:35 **SESSION 14 (PODIUM) - BEST BASIC SCIENCE**
Chairs: Prof Michael Raymond Ruggieri (United States), Dr William C de Groat (United States), Dr Naoki Yoshimura (United States)

09:05 **258 PRIZE AWARD: BEST IN CATEGORY PRIZE: AGING ASSOCIATED UNDERACTIVE BLADDER INVOLVES A DECREASE IN URETHRAL SEROTONIN RELEASED BY 5HT-EXPRESSING CELLS. AN EXPERIMENTAL STUDY IN RAT.**
Coelho A, Morgado A, Oliveira R, Cruz C D, Charrua A, Cruz F

09:20 **259 PRIZE AWARD: BEST NON-CLINICAL ABSTRACT: THERAPEUTIC POTENTIAL OF HUMAN ADIPOSE-DERIVED STEM CELL EXOSOMES IN STRESS URINARY INCONTINENCE – AN IN VITRO AND IN VIVO STUDY**
Ni J, Gu B

09:35 **260 MITOCHONDRIAL-TARGETED ANTIOXIDANT THERAPY IMPROVES SPINAL CORD INJURY ASSOCIATED UROTHELIAL DYSFUNCTION**
Kullmann F A, Truschel S, McDonnell B, Wolf-Johnston A S, Ikeda Y, Zabbarova I, Kanai A J, Shiva S, Apodaca G, Birder L A

09:50 **261 GEL CASTING AS AN APPROACH FOR TISSUE ENGINEERING OF MULTILAYERED TUBULAR STRUCTURES: APPLICATION FOR URETHRAL RECONSTRUCTION**
de Graaf P, van Velthoven M, Ramadan R, Klotz B J, Gawlitta D, Castilho M, Malda J, Costa P, de Kort L M O

10:05 **262 PRIZE AWARD: BEST IN CATEGORY PRIZE: MOLECULAR AND FUNCTIONAL IDENTIFICATION OF NADPH OXIDASE (NOX) IN THE UROTHELIUM: IMPLICATIONS FOR BLADDER DYSFUNCTION AND SPECIFIC ROS CONTROLLING TARGETS**
Wu C, Roberts M, Amosah J, Adjei L, Sui G, Wu R, Archer S, Montgomery B, Ruggieri M R

10:20 **263 URETHRAL SEROTONIN STIMULATES AN URETHRO-VESICAL REFLEX**
Coelho A, Oliveira R, Cavaleiro H, Cruz C D, Cruz F

09:05 - 10:35 **SESSION 15 (PODIUM SHORT ORAL) - OVERACTIVE BLADDER 1**
Chairs: Dr Alex Tong-Long Lin (Taiwan), Dr Christopher John Chermansky (United States), Christine Bradway (United States)

09:05 **264 REGIONAL VARIATION IN DIAGNOSTIC TESTING FOR UNCOMPLICATED OVERACTIVE BLADDER IN THE FEMALE MEDICARE POPULATION**
Vollstedt A, Moses R, Gormley E A

09:12 **265 HIGHER BODY FAT PERCENTAGE AS A IS RISK FACTOR OF OVERACTIVE BLADDER AT OVERWEIGHT WOMEN**
Hagovská M, Svihra J, Bukova A, Svihrova V

09:20 **266 TEMPORAL SUMMATION IS ELEVATED IN WOMEN WITH OAB REPORTING HIGH PSYCHOSOCIAL BURDEN**
Reynolds W S, Kaufman M R, Dmochowski R, Bruehl S

09:27 **267 METABOLISM OF FATTY ACIDS AND BILE ACIDS IN PLASMA ARE ASSOCIATED WITH OVERACTIVE BLADDER: METABOLOMICS ANALYSIS FOR POSSIBLE BIOMARKERS AND POTENTIAL TARGETS FOR NEW TREATMENTS**
Mitsui T, Kira S, Ihara T, Sawada N, Nakagomi H, Shimura H, Miyamoto T, Tsuchiya S, Kanda M, Takeda M

09:35 **268 A PHASE 4, DOUBLE-BLIND, RANDOMIZED, PLACEBO-CONTROLLED, PARALLEL GROUP, MULTI-CENTRE STUDY TO EVALUATE THE EFFICACY, SAFETY, AND TOLERABILITY OF MIRABEGRON IN OLDER ADULT PATIENTS WITH OVERACTIVE BLADDER SYNDROME (PILLAR)**
Wagg A, Staskin D, Engel E, Herschorn S, Kristy R M, Schermer C R

09:42 **269 RELATIONSHIP BETWEEN EXCESS VISCERAL FAT ACCUMULATION AND THE DEVELOPMENT AND SEVERITY OF OVERACTIVE BLADDER**
Matsuo T, Miyata Y, Araki K, Nakamura Y, Sagara Y, Ohba K, Sakai H

09:50 **270 CAN ONABOTULINUMTOXINA IMPROVE SYMPTOMS AND QUALITY OF LIFE IN ALL PATIENTS WITH OVERACTIVE BLADDER, REGARDLESS OF DISEASE DURATION OR BODY MASS INDEX?**
Chermansky C, Rechberger T, Miles-Thomas J, Hale D, Cardozo L, Orejudos A, Patel A, Herschorn S

09:57 **271 OVERLAP OF BOWEL DYSFUNCTION AND URINARY SYMPTOM SEVERITY IN WOMEN WITH OVERACTIVE BLADDER.**
Reynolds W S, Kaufman M R, Dmochowski R

10:05 **272 METABOLOMIC ANALYSIS OF CANDIDATE URINARY MARKERS OF OVERACTIVE BLADDER SYNDROME IN AN AGING FEMALE POPULATION: PILOT PROSPECTIVE STUDY**
Mossa A H, Shamout S, Cammisotto P, Campeau L

10:12 **273 STUDY OF HIGHER THAN 80 YEARS OLD PATIENTS KEEPING FRAILTY UNDER THE THERAPY OF MIRABEGRON FOR OVERACTIVE BLADDER (HOKUTO STUDY)**
Nakagomi H, Mitsui T, Ihara T, Kira S, Sawada N, Kamiyama M, Takeda M

10:20 **274 DO HEALTH DISPARITIES EXIST IN THE INSURED REFRACTORY OAB PATIENT POPULATION?**
Syan R, Zhang C, Enemchukwu E

10:27 **275 A RELATIONSHIP BETWEEN PRE-DIABETES AND OVERACTIVE BLADDER -ANALYSIS OF A HEALTH-SCREENING PROGRAM IN MEN AND WOMEN-**
Aoki Y, Okada M, Ito H, Kusaka Y, Yokoyama O

09:05 - 10:35 SESSION 16 (PODIUM SHORT ORAL) - FEMALE INCONTINENCE

Chairs: Prof Mauro Cervigni (Italy), Dr Kathleen C Kobashi (United States)

09:05 **276 PELVIC FLOOR HYPERTONICITY IN WOMEN WITH PELVIC FLOOR DISORDERS: A CASE CONTROL AND RISK PREDICTION STUDY**
Sabourin J C, Cameron B, Sanaee M S, Koenig N A, Lee T, Geoffrion R

09:12 **277 THE PSYCHIATRIC IMPACT OF MEDICAL AND OTHER TRAUMA ON ADULT UROLOGICAL PROCEDURES**
Chen A, Xu Y, Egan J, Feustel P, De E

09:20 **278 SHORT TERM EFFICACY AND SAFETY OF VAGINAL CO2 LASER IN PATIENTS WITH URODYNAMIC STRESS URINARY INCONTINENCE**
Alcalay M, Ben Ami M, Greenshpun A, Shif E

09:27 **279 RADIOFREQUENCY FOR THE TREATMENT OF STRESS URINARY INCONTINENCE IN FEMALE: RANDOMIZED CLINICAL TRIAL**
Brasil C, Teles A, Lemos N, Basto Brito M, Liony C, Matos J C, Dória M, Leony J C, Lemos L, Campos R, Lordelo P

09:35 **280 PHYSIOLOGICAL MECHANISMS UNDERLYING THE EFFECTIVITY OF AN INTRAVESICAL BALLOON AS THERAPY FOR STRESS URINARY INCONTINENCE**
De Rijk M, Van Koeveringe G

09:42 **281 SAFETY OF AUTOLOGOUS FASCIAL PUBOVAGINAL VERSUS SYNTHETIC MIDURETHRAL SLINGS**
Blaivas J, Daniel M, Kalkan S, Dayan L

09:50 **282 CLINICAL CHARACTERISTICS OF WOMEN CHOOSING CONCURRENT ANTI-INCONTINENCE SURGERY AT TIME OF HYSTERECTOMY FOR ENDOMETRIAL CANCER**
Wohlrab K, Sung V W, Robison K, Howe C, Lowder J, Occhino J, Dunivan G C, Rahn D I, Tunitsky E, Chen G, Clark M, Richter H E

09:57 **283 THE EFFECTIVENESS OF CBT IN THE SEXUAL FUNCTION AND QUALITY OF LIFE OF WOMEN WITH SEXUAL DYSFUNCTION: A COMPARATIVE STUDY.**
Pitia A P, Saskia Tavares J, Teixeira B, Teles A, Lemos A, Nogueira A, Brasil C, Lordelo P

10:05 **284 EFFICACY OF THE SUBURETHRAL TRANSOBTURATOR KIM SYSTEM® FOR FEMALE URINARY INCONTINENCE 10 YEARS AFTER IMPLANTATION**
Padilla-Fernández B, Núñez-Otero J J, Salvatierra-Pérez C, Álvarez-Ossorio Rodal A, Perán-Teruel M, Hernández-Hernández D, García-García M Á, García-Cenador M B, Lorenzo-Gómez M F

10:12 **285 PREVALENCE AND RISK FACTORS OF POSTPARTUM URINARY INCONTINENCE SIX YEARS AFTER FIST DELIVERY- A PROSPECTIVE COHORT STUDY.**
Trevor J J, Stafne S N, Stordahl A, Johannessen H H

10:20 **286 CHARACTERIZATION OF CELLS ISOLATED FROM SUBURETHRAL MUCOSA OF WOMEN WITH STRESS URINARY INCONTINENCE (SUI) AND PELVIC ORGAN PROLAPSE (POP). A COMPARATIVE STUDY**
Flores A I, Perez-Lorenzo M J, de la Torre P, Muñoz-Gálligo E, Masero-Casasola A R, García-García-Porrero A, Gutiérrez-Vélez M C, Medina-Polo J, García-Muñoz H, Grande-García J, Alcazar-Garrido A, Vielsa-Gordillo I

10:27 **287 PELVIC FLOOR MUSCLE DISPLACEMENT DURING JUMPS IN CONTINENT AND INCONTINENT WOMEN: AN EXPLORATORY PILOT STUDY**
Moser H, Leitner M, Eichelberger P, Kuhn A, Baeyens J, Radlinger L

09:05 - 10:35 **W24 OBSTETRIC ANAL SPHINCTER INJURY (OASIS): WHAT NEXT?**
Chair: Alexis Schizas (United Kingdom), Speakers: Paula Igualada-Martinez (United Kingdom), Heidi Brown (United States), Rufus Cartwright (United Kingdom)

09:05 - 10:35 **W25 ICS CORE CURRICULUM (FREE): ICS GLOSSARY DISCUSSION PREVIEW**
Chair: Elizabeth Shelly (United States), Speakers: Luis Abranches-Monteiro (Portugal), Sajjad Rahnama'i (Netherlands), desiree vrijens (Netherlands)

10:35 - 11:00 **COFFEE BREAK & EXHIBITION**

11:00 - 11:30 **SP1: ICS TERMINOLOGY UPDATE**
Chair: Prof Bernard T Haylen (Australia)

11:00 - 12:00 **RT2: ON PATIENT COMMUNICATION AND MEDICAL SELF REGULATION**
Chair: Dr Alan J Wein (United States)Speakers: Mr Arun Sahai (United Kingdom), Shirley Moore (United States), Thomas Lendvay (United States)

11:00 - 12:00 **RT3: FROM OVER TO UNDERACTIVE BLADDER - MECHANISIMS BIOMARKETS AND TREATMENTS**
Chair: Dr Roger Roman Dmochowski (United States)
Speakers: Dr Anthony John Kanai (United States), Prof Gommert A van Koeveringe (Netherlands), Mr Laurence Stewart (United Kingdom)

11:00 - 12:00 **RT4: NOCTURIA AND ITS CONSEQUENCES**
Chair: Enrico Finazzi Agrò (Italy)Speakers: Prof Karel CMM Everaert (Belgium), Dr Jeffrey Paul Weiss (United States), Ray Rosen (United States)

11:00 - 12:30 **W26 ICS CORE CURRICULUM (FREE): CONTINENCE CARE NURSING**
Chair: Sandra Engberg (United States), Speakers: Veronica Haggar (United Kingdom), Tamara Dickinson (United States), Mikel Gray (United States)

11:30 - 12:15 **SP2: SPOTLIGHT ON FAECAL INCONTINENCE: A JOINT ASCRS-ICS SESSION**
Chair: Dr Liliana Bordeianou (United States)Speakers: Dr Massarat Zutshi (United States), Mitchell Bernstein (United States), Alex Ky (United States), Joshua Bleier (United States)

12:00 - 12:05 **BREAK TO CHANGE HALLS**

12:05 - 13:05 **SESSION 18 (PODIUM SHORT ORAL) - BLADDER OUTLET OBSTRUCTION**
Chairs: Mr Marcus John Drake (United Kingdom), Prof Michael Chancellor (United States), Mr William Jaffe

12:05 **298 PRIZE AWARD: BEST IN CATEGORY PRIZE: CHANGE OF DETRUSOR CONTRACTILITY IN PATIENTS WITH AND WITHOUT BLADDER OUTLET OBSTRUCTION AFTER OVER TEN-YEAR FOLLOW-UP**
Chen S, Ong H, Lee Y, Kuo H

12:12 **299 DEVELOPMENT OF A DIGITAL PATIENT-REPORTED OUTCOME MEASURE (PROM) FOR REAL-TIME ASSESSMENT OF OVERACTIVE BLADDER SYNDROME.**
Herrewegh A, Vork L, Leue C, Kruimel J, van Koeveringe G, Vrijens D

12:20 **300 MEDIAN FREQUENCY AND SUM OF AMPLITUDE CHANGES IN RISING SLOPE: TWO POTENTIAL NON-INVASIVE INDICATORS FOR DIFFERENTIATING DU FROM BOO IN MALES**
Li R, Gammie A, Zhu Q, Nibouche M

12:27 **301 THYROID HORMONE AND LOWER URINARY TRACT SYMPTOMS/ BENIGN PROSTATIC HYPERPLASIA**
Lee J H

12:35 **302 THE TEMPORARY IMPLANTABLE NITINOL DEVICE (ITIND) FOR THE MINIMALLY INVASIVE TREATMENT OF BPH: COMPARISON OF 3-YEAR OUTCOMES & COST IN CANADA**
Elterman D, Shepherd S

12:42 **303 DIAGNOSIS AND TREATMENT OF CATHETER-DEPENDENT MEN AFTER TRANSURETHRAL RESECTION OF THE PROSTATE AND LASER FAILURES**
Blaivas J, Liaw C, Policastro L, Dayan L, Roy D

12:50 **304 THE EFFECT OF URINARY RETENTION ON THE SURGICAL OUTCOME OF HOLEP IN PATIENTS WITH LUTS/ BPH: A PROSPECTIVE COHORT STUDY**
Hyeong Dong Y, Yu Jin K, Seung June O

12:57 **305 INCREASED OXIDATIVE STRESS IN THE DETRUSOR OF MEN WITH BLADDER OUTLET OBSTRUCTION**
Averbeck M A, De Lima N G, Motta G A, Beltrao L, Abboud Filho N J, Rigotti C P, Dos Santos W N, Dos Santos S K J, da Silva L F B, Rhoden E L

12:05 - 13:05 **SESSION 19 (PODIUM SHORT ORAL) - POTPOURRI**
Chairs: Prof David Castro-Diaz (Spain), Niall Galloway (United States)

12:05 **306 A NOVEL, NON-OPIOD BASED TREATMENT APPROACH TO MEN WITH UROLOGIC CHRONIC PELVIC PAIN SYNDROME (UCPPS) USING ULTRASOUND GUIDED NERVE HYDRODISSECTION AND PELVIC FLOOR MUSCULATURE TRIGGER POINT INJECTIONS**
Shrikhande A, Bayer- Mertens Human A, Ahmed T, Shrikhande G, Hill C

12:12 **307 WHY NOT TONIGHT?**
Rantell A, Innocent S, Robinson D, Cardozo L

12:20 **308 EXPLORING GRADUATE PHYSIOTHERAPY STUDENTS' EXPERIENCES OF INTIMATE PEER PHYSICAL EXAMINATIONS**
Sherburn M, Virtue D, Remedios L

12:27 **309 A NOVEL INTRAOBTURATOR ANCHORING TECHNIQUE FOR MALE INCONTINENCE SURGERY**
Anding R, Kirschner-Hermanns R

12:35 **310 PRIZE AWARD: BEST IN CATEGORY PRIZE: QUANTIFICATION OF CEREBRAL BLOOD FLOW DURING BLADDER FILLING IN HEALTHY SUBJECTS**
Tam J, Wengler K, Kim J, Waltzer W, He X, Weissbart S

12:42 **311 ALTERATION OF SPHINGOSINE-1-PHOSPHATE SIGNALING PATHWAY IN THE VAGINAL WALL OF WOMEN WITH PELVIC ORGAN PROLAPSE**
Sperling C, Toidze T, DiSanto M

12:50 **312 PRIZE AWARD: BEST IN CATEGORY PRIZE: GAPS IN CURRENT TREATMENT OF NOCTURIA**
Drangsholt S, Arcila Ruiz M, Brucker B M

12:57 **313 RESULTS OF TRANSURETHRAL RESECTION OF THE PROSTATE IN MALES WITH DETRUSOR UNDERACTIVITY**
Rubilotta E, Balzarro M, D'Amico A, Cerruto M A, Trabacchin N, Tamanini I, Pirozzi M, Bassi S, Artibani W

12:05 - 13:05 **SESSION 20 (PODIUM SHORT ORAL) - PELVIC FLOOR MUSCLE ASSESSMENT AND TREATMENT**
Chairs: Dr Melanie Morin (Canada), Prof Cristina Naranjo Ortiz (Spain), Dr Elizabeth R Shelly (United States)

12:05 **314 PRIZE AWARD: BEST IN CATEGORY PRIZE: CAN YOU TRAIN THE PELVIC FLOOR MUSCLES BY CONTRACTING OTHER RELATED MUSCLES?**
Kruger J A, Jonathan G, David B, Bø K

12:12 **315 PELVIC FLOOR MUSCLE TRAINING AS A TREATMENT APPROACH FOR GENITOURINARY SYNDROME OF MENOPAUSE**
Mercier J, Morin M, Zaki D, Reichetzer B, Lemieux M, Khalifé S, Dumoulin C

12:20 **316 DOES BIOFEEDBACK OPTIMIZE THE EFFECT OF PELVIC FLOOR MUSCLE EXERCISES ON STRESS URINARY INCONTINENCE IN WOMEN? A SYSTEMATIC REVIEW**
Wu C, Palmer M H

12:27 **317 RELIABILITY OF INTRAVAGINAL PRESSURE MEASUREMENTS DURING MAXIMAL VOLUNTARY PELVIC FLOOR MUSCLE CONTRACTION AND VALSALVA IN LYING AND STANDING POSITIONS**
Cacciari L, Jennifer K, Goodman J, Budgett D, Dumoulin C

12:35 **318 PELVIC FLOOR MUSCLE ACTIVATION DURING CONTRACTIONS OF THE MUSCLES SURROUNDING THE PELVIC FLOOR**
Voorham J, Bennink D, De Wachter S G, Putter H, Pelger R, Lycklama à Nijeholt G, Voorham - van der Zalm P

12:42 **319 PSYCHOSOCIAL FACTORS INFLUENCING PHYSIOTHERAPEUTIC ADHERENCE TO GROUP-BASED OR INDIVIDUALIZED PELVIC FLOOR REHABILITATION: PERCEPTIONS OF OLDER WOMEN WITH URINARY INCONTINENCE**
Fréchette-Chaîné É, Mercier J, Fraser S, Southall K, Morin M, Dumoulin C

12:50 **320 MOTOR UNIT RECRUITMENT BEHAVIOR OF CONTINENT AND INCONTINENT WOMEN'S PELVIC FLOOR MUSCLES WHILE RUNNING: A WAVELET APPROACH**
Koenig I, Eichelberger P, Moser H, Leitner M, Kuhn A, Taeymans J, Radlinger L

12:57 **321 PELVIC FLOOR MUSCLES REST-ACTIVITY AND HOLD CONTRACTION IN DIABETIC PREGNANT WOMEN DURING PREGNANCY: COHORT STUDY**
Barbosa A M P, Prudencio C B, Pinheiro F A, Sartorão Filho C I, Pedroni C R, Kenickel S, Orlandi M I G, Gaitero M V C, Prata G M, Sarmento B V, Quiroz S C B V, Rudge M V C

12:05 - 13:05 **W27 FEMALE URETHRA: CHALLENGING SCENARIOS**
Chair: Paulo Palma (Brazil), Speakers: Cassio Riccetto (Brazil), Mauro Cervigni (Italy), Ömer Acar (Turkey)

12:35 - 13:05 **AGM ENTRANCE SCANNING**
Chair: Prof Sherif Mourad (Egypt)Members: Prof David Castro-Diaz (Spain), Prof Mauro Cervigni (Italy), Prof Carlos Levi D'Ancona (Brazil), Dr Alex Digesu (United Kingdom), Mr Marcus John Drake (United Kingdom), Dr Jerzy B Gajewski (Canada), Dr Alex Tong-Long Lin (Taiwan), Prof Cristina Naranjo Ortiz (Spain)

12:35 - 13:05 **NURSES NETWORKING LUNCH**

13:05 - 14:00 **ICS AGM**

Chair: Prof Sherif Mourad (Egypt)Members: Prof David Castro-Diaz (Spain), Prof Mauro Cervigni (Italy), Prof Carlos Levi D'Ancona (Brazil), Dr Alex Digesu (United Kingdom), Mr Marcus John Drake (United Kingdom), Dr Jerzy B Gajewski (Canada), Dr Alex Tong-Long Lin (Taiwan), Prof Cristina Naranjo Ortiz (Spain)

13:05 - 14:00 **LUNCH, E-POSTERS AND EXHIBITION**

13:05 - 14:00 **SESSION 21 (OPEN DISCUSSION EPOSTER) - OPEN DISCUSSION E-POSTERS 2**

13:10 **322 FUNCTIONAL CHANGES DURING THE VOIDING PHASE IN MALES WITH NON-NEUROGENIC DETRUSOR UNDERACTIVITY UNDERGOING BLADDER CATHETERIZATION**
Castro-Díaz D M, Vírseda-Chamorro M, Salinas-Casado J, Méndez-Rubio S, Esteban-Fuertes M

13:15 **323 URODYNAMIC ANALYSIS OF RAT IN THE STATE OF SLIGHT ANESTHESIA, DEEP ANESTHESIA AND WAKEFULNESS**
He Y L, Wen J G, Li Y L, Wen Y B, He X, Feng J J, Ma Y, Wang X Z, Chen Y, Xu P

13:20 **324 COMPARISON OF THE EFFECT OF SALINE AND HEPARIN SALINE IN THE PREVENTION OF TUBE BLOCKAGE DURING URODYNAMIC EXAMINATION**
Zeng X, Shen H, Luo D

13:25 **325 DETRUSOR PRE LEAK POINT PRESSURE : A MORE RELIABLE PARAMETER TO PREDICT THE RISK TO THE UPPER URINARY TRACTS?**
Yande S, Joshi M, Rawal K

13:30 **326 COMPARISON OF THE DIAGNOSTIC CRITERIA OF URODYNAMIC STUDY FOR DETRUSOR UNDERACTIVITY IN PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA**
Yoo E S, Kim S W, Chung J, Ha Y, Choi S H, Lee J N, Kim H T, Kim B S, Kim T, Kwon T G, Chung S K, Bae J H

13:35 **327 OVERACTIVE BLADDER AMONG SAUDI WOMEN:**
Almousa R, Albagshi S, Alabbad A, Alshamsi H, Almuslim O

13:40 **328 DETRUSOR UNDERACTIVITY OF ELDER FEMALE PATIENTS EVALUATED BY PROJECTED ISOVOLUMETRIC PRESSURE 1 AND CUTOFF CRITERIA OF UDS PARAMETERS**
Hayashi T, Asakura H, Kayama E, Ebine T, Nakahira Y, Yanaihara H

13:45 **329 INCIDENCE, RISK FACTORS AND MANAGEMENT OF PYOCYSTIS IN A REMNANT BLADDER AFTER ILEAL CONDUIT URINARY DIVERSION FOR BENIGN AETIOLOGY**
Mankaryous G, Barratt R, Pakzad M H, Hamid R, Ockrim J L, Greenwell T J

13:50 **330 MAXIMUM URETHRAL CLOSURE PRESSURE AS PREDICTOR OF SUCCESS WITH SACRAL NEUROMODULATION**
Bueno P, Thomas L, Hashim H

13:10 **331 COST-UTILITY ANALYSIS OF UPFRONT PHARMACOTHERAPY COMPARED TO AN UPFRONT SURGICAL INTERVENTION FOR PATIENTS WITH BENIGN PROSTATE HYPERPLASIA**
Erman A, Masucci L, Krahn M, Shepherd S, Elterman D

13:15 **332 FUNCTIONAL AND MOLECULAR DYSREGULATION OF THE LOWER URINARY TRACT SMOOTH MUSCLE RESULTING IN UNDERACTIVE BLADDER IN OLD MICE**
de Oliveira M G, Mónica F Z, Alexandre E C, Silva F H, Bonilla-Becerra S M, Justo A F O, Bertollotto G M, Antunes E

13:20 **333 URINARY INCONTINENCE IN WOMEN WHO GAVE BIRTH AT LEAST ONCE, A DESCRIPTIVE STUDY IN A LARGE AFRICAN UNIVERSITY HOSPITAL.**
Loposso M, Tshibi K, Luzolo N, Lufuma Lwa Nkandi S, Punga Maole A, Moningo D, Diangienda P, Esika J P, Kangundia C, Bossa J, Derrider D

13:25 **334 AGE-SPECIFIC PREVALENCE AND COMPARISONS OF URODYNAMICS AND BLADDER DIARY BETWEEN OVERACTIVE BLADDER-WET AND -DRY WOMEN BASED ON BLADDER DIARY**
Hsiao S, Chang T, Chen C, Wu W, Lin H

13:30 **335 BREASTFEEDING AND POSTPARTUM GENITOURINARY SYMPTOMS, A PROSPECTIVE COHORT STUDY**
Illston J D, McMinn E K, McIlwraith C A, McGraw M R, Mounir D, Lin C P, Richter H E

13:35 **336 ARE BLADDER PAIN SYNDROME AND OVERACTIVE BLADDER PART OF ONE DISEASE?**
Asfour V, Viet-Rubin N, Ford A, Digesu A, Fernando R, Tailor V, Gibbs K, Verdon L, Khullar V

13:40 **337 LOWER URINARY TRACT SYMPTOMS AND URODYNAMIC FINDINGS BEFORE AND AFTER URETHRAL DIVERTICULUM EXCISION**
Seth J, Itam S, Pakzad M H, Hamid R, Ockrim J L, Greenwell T J

13:45 **338 AUTOMATED CLASSIFICATION OF FEMALE UROFLOWMETRY CURVE PATTERNS.**
Sorel M, Baas S, Rosier P F W M, Bosch R, Brand E, van der Kamp M, Boele D, Huizinga E, Geurts B, de Kort L M O

13:10 **339 BLADDER HEALTH TERMINOLOGY – PROPOSED DEFINITIONS FOR WOMEN AND GIRLS**
Lowder J, Bavendam T, Berry A, Brady S, Goode P, Lewis C B, Mueller E, Newman D K, Palmer M H, Rickey L, Lukacz E, On behalf of The Prevention of Lower Urinary Tract Symptoms (PLUS) Research Consortium

13:15 **340 RANDOMIZED TRIAL TO COMPARE SOLIFENACIN AND TRANSOBTURATOR TAPE PLACEMENT AFTER BILATERAL UTEROSACRAL LIGAMENT REPLACEMENT IN THE TREATMENT OF URGENCY URINARY INCONTINENCE - FIRST RESULTS**
Ludwig S, Jäger W, Mallmann P

13:20 **341 TRANSVESICLE LAPAROENDOSCOPIC SINGLE-SITE SURGERY FOR REPAIR OF VESICOVAGINAL FISTULA WITH A HOMEMADE SINGLE-PORT DEVICE: EXPERIENCE IN 42 PATIENTS**
Huang H, Ma X, Fan X, Wu W, Wang Q, Li Z, Lai Y, Peng S, Lin T, Huang J

13:25 **342 UROPATHOGENS: INTRACELLULAR LOCALISATION AND VIRULENCE MECHANISMS**
Ognenovska S, Cheng Y, Mukerjee C, Sanderson-Smith M, Schembri M, Mansfield K J, Moore K H

13:30 **343 ASSESSING THE PREVALENCE OF UNREPORTED URINARY INCONTINENCE IN A LOW RESOURCE SETTING**
McDougald M, Omer H, Ahmed M, Mohammed M, Mayram M

13:35 **344 URINARY INCONTINENCE AND QUALITY OF LIFE IN ENDOMETRIAL CANCER PATIENTS AFTER ROBOTIC-ASSISTED LAPAROSCOPIC HYSTERECTOMY WITH LYMPH NODE DISSECTION**
Sharma S, Lipetskaia L, Johnson M, Ostergard D, Francis S

13:40 **345 IMPACT OF UROGYNAECOLOGICAL SYMPTOMS ON THE QUALITY OF LIFE OF WOMEN RECEIVING TREATMENT DUE TO ENDOMETRIAL CANCER.**
Zietek A, Nowakowski L, Futyma K, Rechberger T, Rechberger E, Miotla P

13:45 **346 LOWER URINARY TRACT SYMPTOMS COULD REFLECT A STRESSFUL WORK ENVIRONMENT**
Moreno-Palacios J, López-Sámano V A, Aviles-Ibarra O J, Castro-Morales L A, Serrano-Brambila E, Maldonado-Alcaraz E

13:50 **347 THE ELEVATION ANGLE OF THE VAGINA (EAV) FOLLOWING DIFFERENT PELVIC RECONSTRUCTIVE PROCEDURES**
Neymeyer J, Weintraub A, Weinberger S, Moldovan D E, Kornienko K, Schlomm T

13:10 **348 PREVALENCE AND RISK FACTORS FOR URINARY INCONTINENCE IN PREGNANCY IN A LOW-RESOURRCED SETTING**
Okunola T O, Olubiyi O A

13:15 **349 UROPATHOGENIC E. COLI (UPEC) CLEARANCE IN OVARIECTOMIZED (OVX) UROTHELIALLY RESTRICTED ESTROGEN RECEPTOR BETA OVEREXPRESSING TRANSGENICE MICE COMPARED TO CONTROL MICE**
Popiel P, Yeh J, Chai T

13:20 **350 INCIDENCE OF ACUTE RETENTION OF URINE FOLLOWING MID-URETHRAL SLING PROCEDURE AND VALIDATION OF A SCREENING PROTOCOL**
Rabicki K, Pudwell J, Harvey M

13:25 **351 SHOULD WE CONDUCT BIOFEEDBACK TREATMENT AFTER BOTULINUM TOXIN INJECTIONS INTO PELVIC FLOOR MUSCLES IN WOMEN WITH DYSFUNCTIONAL VOIDING IN CASES WHEN THE FIRST LINE BIOFEEDBACK WAS NOT EFFECTIVE.**
Romikh V, Borisenko L, Zakharchenko A, Panteleev V, Romikh P

13:30 **352 UTILISING THE PRESSURE PROFILE TO ASSESS REPEATABILITY OF AN INTRA-VAGINAL PRESSURE SENSOR ARRAY (THE FEMFIT)**
Chan D K E, Budgett S C, Budgett D, Kruger J A

13:35 **353 INCREASING VAGINAL REPAIR OF VESICOVAGINAL FISTULAE DOES NOT AFFECT OUTCOME**
Itam S, Barratt R, Pakzad M H, Hamid R, Ockrim J L, Shah J, Greenwell T J

13:40 **354 OUTCOMES OF COMPLETE EXCISION OF PARAURETHRAL CYSTS IN WOMEN**
O'Connor E, Kocadag H, Hamid R, Ockrim J L, Greenwell T J

13:45 **355 THE SYMPTOMATIC DIFFERENCES BETWEEN MEN AND WOMEN WITH DETRUSOR UNDERACTIVITY**
Trimboli M, Axell R G, Kocadag H, Mahreen H P, Rizwan H, Jeremy L O, Tamsin J G

13:50 **356 ONABOTULINUMTOXINA INJECTION TO THE EXTERNAL URETHRAL SPHINCTER FOR VOIDING DYSFUNCTION IN FEMALES: A TERTIARY CENTRE EXPERIENCE**
Seth J, Trimboli M, Hamid R, Ockrim J L, Greenwell T J, Pakzad M H

13:55 **357 OUTCOMES OF RECONSTRUCTIVE UROLOGICAL SURGERY IN RADIOTHERAPY PATIENTS**
Toia B, Seth J, Ecclestone H, Pakzad M H, Hamid R, Greenwell T J, Ockrim J L

13:10 **358 MECHANISMS UNDERLYING BLADDER HYPERSENSITIVITY IN FEMALE MICE WITH ESTROGEN DEFICIENCY**
Takaoka E, Suzuki T, Mizoguchi S, Kurobe M, Ni J, Kwon J, Shimizu N, Onozawa M, Miyazaki J, Nishiyama H, Yoshimura N

13:15 **359 BLADDER VOIDING EFFICIENCY (BVE) IN WOMEN. IS IT REPRODUCIBLE BETWEEN SUCCESSIVE FREE AND INTUBATED FLOW? IS IT A GOOD INDICATOR FOR URODYNAMIC DIAGNOSIS IN WOMEN?**
Valentini F, Marti B, Robain G, Nelson P

13:20 **360 URINARY INCONTINENCE IN WOMEN: WHAT DO GP'S KNOW?**
Zweers H, van Balken M

13:25 **361 URINARY INCONTINENCE IN WOMEN: DO GP'S FOLLOW THEIR GUIDELINES?**
Zweers H, van Balken M

13:30 **362 EVALUATION THE SHORT-TERM OUTCOME ON A STRUCTURED BLADDER TRAINING PROGRAM FOR IDIOPATHIC OVERACTIVE BLADDER SYNDROME**
Yeung K, Lui K, Lau K, Kw W, Sk L, Nh C, Cm L, Cn T

13:35 **363 CORRELATIONS BETWEEN METABOLIC SYNDROMES RELATED FACTORS AND URETHRAL RESISTANCE IN FEMALE FUNCTIONAL BLADDER OUTLET OBSTRUCTION**
Yoon H, Yoon H S, Shim B S

13:40 **364 TREATMENT WITH A POLYCAPROLACTONE-BASED BIORESORBABLE BULKING AGENT FOR MILD TO MODERATE SUI**
Koldewijn E, De Wachter S G, Oerlemans D, de Wildt M, Vandoninck V

13:45 **365 FIVE-YEAR OUTCOMES OF TRANSOBTURATOR TAPE (TOT) COMPARED WITH TENSION-FREE VAGINAL TAPE (TVT) IN TREATMENT OF WOMEN WITH STRESS URINARY INCONTINENCE**
Abouhashem S, Mostafa M, Elsayed D, Elbrombely W, Desoky E, Salem H, Aly M, Elbendary L, Maarof A

13:50 **366 FIVE-YEARS FOLLOW-UP OF TENSION-FREE VAGINAL TAPE (TVT) VERSUS RECTUS SHEATH SLING FOR SURGICAL TREATMENT OF FEMALE STRESS URINARY INCONTINENCE**
Abou Hashem S, Mustafa M, Elbrombely W

13:10 **367 COMPLICATIONS AFTER SURGICAL REPAIR FOR URINARY INCONTINENCE OR PELVIC ORGAN PROLAPSE IN WOMEN. ONE CENTER RETROSPECTIVE STUDY.**
Charveriat A, Tartarin F, Merlet L, Laurence B, Fritel X

13:15 **368 EFFECTS OF THE REMEEX SYSTEM IN FEMALE PATIENTS WITH INTRINSIC SPHINCTERIC DEFICIENCY AND RECURRENT URINARY INCONTINENCE: TEN-YEAR OUTCOMES**
Jung H C, Ko Y H, Choi J Y, Moon K H

13:20 **369 URINARY INCONTINENCE AMONG COMPETITIVE FEMALE ROPE SKIPPING ATHLETES: A CROSS-SECTIONAL STUDY**
Dobrowolski S L, Pudwell J, Harvey M

13:25 **370 EFFICACY OF THE AUTOLOGOUS FASCIAL SLING IN THE NEUROPATHIC POPULATION**
Downey A P, Reid S V R

13:30 **371 FUTURE OF UROLOGISTS IN A TAPELESS SOCIETY? A RETROSPECTIVE ANALYSIS OF CONVENTIONAL OPEN PROCEDURES TO TREAT STRESS URINARY INCONTINENCE IN WOMEN**
Downey A P, Manley J, Srivastava K, Watcyn-Jones T, Lupton B, Kumar V

13:35 **372 FEMALE STRESS URINARY INCONTINENCE TREATMENTS WITH ADJUSTABILITY SINGLE INCISION SLING (ALTIS), OUR EXPERIENCE**
Gentile B C, Giulianelli R, Mirabile G, Albanesi L, Tariciotti P, Rizzo G, Aloisi P

13:40 **373 OUTCOMES OF A STAGED MIDURETHRAL SLING STRATEGY IN WOMEN WITH SYMPTOMATIC SUI UNDERGOING PELVIC ORGAN PROLAPSE REPAIR**
Giugale L, Carter-Brooks C, Ross J, Zyczynski H

13:45 **374 LONG-TERM EFFICACY AND SAFETY OF A NEW ADJUSTABLE SINGLE-INCISION SLING FOR THE TREATMENT OF FEMALE STRESS URINARY INCONTINENCE**
González-López R, Garde-García H, Coloma-Ruiz L, González-Enguita C

13:50 **375 TRENDS OF THE PROVIDERS IN THE MANAGEMENT OF STRESS URINARY INCONTINENCE**
Abdallah M M, Abdelbaky T, Abdel Gawad O, Solaiman E H, Fathy M, Khalifa A O

13:10 **376 BMI AND POSTOPERATIVE COMPLICATIONS IN SURGICAL TREATMENT OF STRESS URINARY INCONTINENCE.**
Al-Dali Boada D, Pérez de Puig M, López Sebastian C, Girvent Vilarmau M, Pereda Núñez A, Ojeda Pérez F

13:15 **377 MACROSOMIA AND OPERATIVE VAGINAL DELIVERIES AS RISK FACTORS FOR INCONTINENCE AND DYSPAREUNIA.**
López Sebastian C, Pérez de Puig M, Pereda Núñez A, Girvent Vilarmau M, Ojeda Pérez F

13:20 **378 INTRA-SESSION-RELIABILITY OF PELVIC FLOOR MUSCLE ELECTROMYOGRAPHY DURING RUNNING IN CONTINENT AND STRESS URINARY INCONTINENT WOMEN**
Leitner M, Moser H, Eichelberger P, Kuhn A, Radlinger L

13:25 **379 INVOLUNTARY ACTIVITY OF PELVIC FLOOR MUSCLES IN HEALTHY WOMEN WHILE PERFORMING ACTIVITIES OF DAILY LIVING**
Schraknepper A, Wassmer Saeuberli P, Eichelberger P, Luginbuehl H, Radlinger L

13:30 **380 ULTRASOUND OF TRANSOBTURATOR SUBURETHRAL TAPE AND CLINICAL PALPATION**
Ortega Cárdenes I, Martín-Martínez A, Medina Castellano M, Fernández Medero A, Perez Morales E

13:35 **381 SAFETY AND LONG TERM EFFICACY OF TRANSOBTURATOR MIDURETHRAL SLING PROCEDURE USING THE MONARC® KIT**
Padoa A, Hassouna H, Tsviban A, Schneider D, Smorgick N

13:40 **382 VARIATIONS IN MIDURETHRAL TAPE LOCALIZATION AND EARLY OUTCOMES – A PRELIMINARY REPORT.**
Pawlaczyk A T, Matuszewski M

13:45 **383 THE MINIARC SLING SYSTEM FOR THE TREATMENT OF FEMALE STRESS URINARY INCONTINENCE - A COMPARISON OF TECHNIQUES**
Ang J, Han H C

13:50 **384 CAN NECK CIRCUMFERENCE BE AN EFFECTIVE PREDICTOR OF URINARY INCONTINENCE IN A BARIATRIC POPULATION?**
Slagus J, Ablove T

13:10 **385 OUTCOMES OF TRANSABDOMINAL AND TRANSVAGINAL BLADDER NECK CLOSURE**
Mosli-Lynch C, Trimboli M, Toia B, Pakzad M H, Hamid R, Ockrim J L, Greenwell T J

13:15 **386 THE AUTOLOGOUS RECTUS FASCIA SHEATH SACROCOLPOPEXY AND SACROHYSTEROPEXY: A MESH FREE ALTERNATIVE FOR RECURRENT VAULT AND UTERINE PROLAPSE IN PATIENTS WITH COMPLEX PELVIC FLOOR DYSFUNCTION**
Seth J, Toia B, Ecclestone H, Pakzad M H, Hamid R, Greenwell T J, Ockrim J L

13:20 **387 ARTIFICIAL URINARY SPHINCTER IN WOMEN WITH RECURRENT STRESS URINARY INCONTINENCE**
Smits M A C, Valk F, Marcelissen T A T, van Koeveringe G A

13:25 **388 CHANGE OF BLADDER COMPLIANCE AFTER MIDURETHRAL SLING FOR FEMALE NEUROGENIC URINARY INCONTINENCE**
Son H S, Kim J H

13:30 **389 TVT-ABBREVO: A RETROSPECTIVE STUDY OF EFFICACY AND OUTCOMES AT 5-YEARS FOLLOW UP AT A TERTIARY CENTRE IN SINGAPORE**
Tan S Q, Han H C

13:35 **390 URETHRAL EROSION FOLLOWING MIDURETHRAL SLING SURGERY – FREQUENCY AND MANAGEMENT OF THIS UNCOMMON COMPLICATION AMONGST PATIENTS UNDERGOING SLING REVISION**
Timmons D, Fletcher M, Medina C

13:40 **391 ARE PELVIC FLOOR ULTRASOUND PARAMETERS AFFECTED BY AGING? A COMPARISON BETWEEN YOUNG AND OLD NULLIPAROUS WOMEN**
Alshiek J, Jalalizadeh M, Chitnis P, Wei Q, Shobeiri S A

13:45 **392 WHAT IS THE MOST ACCURATE WAY TO ASSESS THE TRUE BLADDER WALL THICKNESS?**
Asfour V, Da Silva A, Kayleigh G, Veit-Rubin N, Digesu A, Fernando R, Khullar V

13:50 **393 ULTRASOUND IMAGING OF PELVIC FLOOR FUNCTION IN WOMEN WHO RECEIVED PELVIC RADIOTHERAPY: A FEASIBILITY STUDY.**
Bernard S, Frenette A, McLean L, Noël P, Froment M, Hébert L J, Moffet H

13:55 **394 PRIMARY BLADDER NECK OBSTRUCTION: MUSCULOSKELETAL FINDINGS AT IMAGING**
Camerota T C, Broglia D

13:10 **395 "PUMPING PROBE TECHNIQUE" AND COMPLETE SEALING STENT - A NEW SIMPLE METHOD FOR THE DETECTION AND TREATMENT OF URETERIC FISTULAE**
Neymeyer J, Weichert A, Weinberger S, Schlomm T

13:15 **396 HIGH FIELD SINGLE SUBJECT BRAIN MAPPING OF MALE GENITAL TOUCH AND PELVIC FLOOR MOTOR CONTROL. A 7-TESLA FMRI STUDY.**
Groenendijk I, Luijten S, van der Zwaag W, Holstege J, Scheepe J, de Zeeuw C, Blok B F M

13:20 **397 LUMBOSACRAL PLEXUS TRACTOGRAPHY TO DIAGNOSE PUDENDAL NERVE AND OTHER INTRAPELVIC ENTRAPMENT NEUROPATHIES**
Lemos N, Fernandes G L, Melo H J F, Morgado-Ribeiro A, Szejnfeld J, Cancelliere L, Sermer C, Li A L K, Naraghi A, Atri M, Girão M J B C, Goldman S

13:25 **398 FLUID DYNAMICAL ASSESSMENT OF LOWER URINARY TRACT: EXPLORATORY RESEARCH TO OBSERVE VORTICITY IN MALE LOWER URINARY TRACT USING COLOR DOPPER ULTRASONOGRAPHY**
Minagawa T, Ogawa T, Ishizuka O

13:30 **399 IDENTIFICATION OF BLADDER WALL MICROMOTION USING M-MODE ULTRASOUND IN A PORCINE MODEL AND IN HUMANS WITH AND WITHOUT DETRUSOR OVERACTIVITY**
Anna N, Zachary C, Uzoma A, Charles B, Andrea B, Adam K, John S

13:35 **400 ULTRASONOGRAPHIC FEATURES AND SURGICAL ANALYSIS OF POSTERIOR URETHRAL VALVES IN CHILDREN**
Zhou W, Li S, Wang H, Liu X, Chen J, Jiang J, Li W, Sun F, Sun P, Xu Q, Diao H, Yao F

13:40 **401 ABDOMINAL ULTRASOUND PROBE TO BLADDER WALL DEPTH VARIATIONS DUE TO BMI, BLADDER VOLUME AND BODY POSITION SUIT NEAR INFRARED SPECTROSCOPY DETECTION OF WALL MICROMOTION**
Tensen S, Klausner A, Stothers L, Macnab A, Speich J E

13:45 **402 FIXATION ABILITY OF CONTEMPORARY USED VAGINAL KITS IN PROLAPS SURGERY**
Halaska M, Sedlacek R, Lincova M, Nanka O, Maxova K

13:50 **403 SURGERY CAN BE A SAFE CHOICE TO TREAT PELVIC ORGAN PROLAPSE IN ELDERLY PATIENTS, A SINGLE CENTER EXPERIENCE.**
Ferjaoui M A, Ghrasliya S, Lamiri N, Marzougui A, Samaali K, Sboui M, Malek M, Neji K

13:10 **404 COMPARISON OF TENSION-FREE VAGINAL MESH SURGERY AND LAPAROSCOPIC SACROCOLPOPEXY CONCERNING SUBSEQUENT LOWER URINARY TRACT SYMPTOMS IN PATIENTS WITH PELVIC ORGAN PROLAPSE – NON-RANDOMIZED PROSPECTIVE STUDY**
Yoshizawa T, Yamaguchi K, Murata Y, Obinata D, Matsui T, Mochida J, Takahashi S

13:15 **405 VUE: TWO UK BASED MULTICENTRE PARALLEL RANDOMISED CONTROLLED SURGICAL TRIALS FOR UTERINE AND VAULT PROLAPSE**
Hemming C, Constable L, Boyers D, Breeman S, Goulao B, Cooper K, Freeman R, Smith A, Elders A, Hagen S, Glazener C

13:20 **406 TEN YEARS OF EXPERIENCE WITH USING FASCIA LATA HAMMOCK AUTOGRAFT TO REPLACE COMPLICATED VAGINAL MESH UNDER THE BLADDER**
Jalalizadeh M, Awad C, Alshiek J, Shobeiri S A

13:25 **407 TEN YEAR RESULTS OF CONCURRENT UROGYNECOLOGY AND GYNECOLOGIC ONCOLOGY SURGERIES**
Kieserman-Shmokler C, Brackmann M, Johnston C, Berger M B

13:30 **408 IS SACRAL NEUROMODULATION EFFECTIVE IN WOMEN WITH PRIOR PROLAPSE REPAIR?**
Syan R, Torosis M, Young-Lin N, Comiter C V, Sokol E R

13:35 **409 A QUALITATIVE STUDY OF WOMEN'S VALUES AND DECISION-MAKING SURROUNDING LEFORT COLPOCLEISIS**
Wadsworth K, Lovatsis D

13:40 **410 COMPARISON OF INTERVIEW-BASED AND SELF-ADMINISTERED ASSESSMENT OF ANAL INCONTINENCE USING WEXNER AND ST. MARK'S INCONTINENCE SCORES**
Johannessen H H, Stordahl A, Trevor J J, Hasvik E, Norderval S

13:45 **411 ESTROGEN STATUS AND FECAL INCONTINENCE**
Mou T, Craig K, Dune T

13:50 **412 QUALITY OF LIFE AND PREVENTION OF BACTERIURIA WITH TRANSANAL IRRIGATION IN MULTIPLE SCLEROSIS: SHORT-TERM RESULTS OF A SINGLE COHORT STUDY**
Iacovelli V, Petta F, Filippone R, Andrea D, Pletto S, Finazzi Agrò E

13:10 **413 APPROPRIATE SCREENING FOR UROLOGIC COMPLICATIONS AFTER SPINAL CORD INJURY IN A NON-DESIGNATED SPINAL CORD INJURY CENTER VETERANS AFFAIRS HOSPITAL**
Greiman A, Kazi R, Hill H, Cox L

13:15 **414 HIGH DOSES OF BOTOX TO TREAT LEVATOR SPASM AND OBSTRUCTED DEFECATION : TO REPEAT OR NOT?**
Reif T, Gurland B, Hull T, Zutshi M

13:20 **415 VOIDING DYSFUNCTION AND COMPLICATIONS IN MULTIPLE SCLEROSIS**
Abello A, Das A K

13:25 **416 CYSTECTOMY WITH CONTINENT URINARY DIVERSION VERSUS ILEAL CONDUIT: FUNCTIONAL OUTCOME AND POSTOPERATIVE COMPLICATIONS OF A SALVAGE TREATMENT FOR REFRACTORY DETRUSOR OVERACTIVITY**
Bywater M, Fröhlich M, Schmid D M, Kessler T M, Eberli D

13:30 **417 BLADDER AND BOWEL DYSFUNCTION IN CHILDREN WITH ACQUIRED BRAIN INJURY**
Mosiello G, Chiminello R, Castelli E

13:35 **418 IMPROVEMENT OF SYMPTOMATOLOGY AND SATISFACTION IN PATIENTS WITH NEUROGENIC AND NO NEUROGENIC LOWER URINARY TRACT DYSFUNCTION, TREATED WITH SACRAL NEUROMODULATION.**
Castaño J C, Osorio H, Chica A, Acosta N, Lopera A

13:40 **419 INFLUENCE OF USING DISPOSABLE DIAPERS ON PEDIATRIC BLADDER AND BOWEL DYSFUNCTION AND ITS RISK FACTORS IN MAINLAND CHINA**
Xu P, Wen J G, Wen Y B, Wang X Z, Wang Y H, Wang Q W, Li Z Z, He Y L, Rittig S, Jorgensen C, Bauer S, Mosiello G

13:45 **420 LONG-TERM DURABILITY OF THE HEMI-KOCK CONTINENT STOMA WITH CYSTOPLASTY FOR NEUROGENIC LOWER URINARY TRACT DYSFUNCTION**
Herschorn S

13:50 **421 THE INHIBITORY EFFECTS OF GHRELIN ON MICTURITION REFLEX IN URETHANE-ANESTHETIZED RATS**
Honda M, Tsounapi P, Kimura Y, Kawamoto B, Shimizu S, Hikita K, Shimizu T, Saito M, Takenaka A

13:10 **422 FEMALE SEXUAL DYSFUNCTION AMONG GREEK WOMEN WITH MULTIPLE SCLEROSIS: CORRELATIONS WITH ORGANIC AND PSYCHOLOGICAL FACTORS**
Konstantinidis C, Tzitzika M, Thomas C, Nikolia A, Samarinas M, Kratiras Z, Badis A, Skriapas K

13:15 **423 VIDEO-URODYNAMIC PREDICTIVE FACTORS OF SUCCESSFUL URETHRAL ONABOTULINUMTOXINA TREATMENT OF NEUROGENIC OR NON-NEUROGENIC URETHRAL SPHINCTER HYPERACTIVITY**
Lee Y, Ong H, Jiang Y, Jhang J, Kuo H

13:20 **424 DOES SALT RESTRICTION RECOVER URINE STORAGE DYSFUNCTION IN SALT-SENSITIVE RATS?**
Kurokawa T, Nagase K, Matsuta Y, Aoki Y, Ito H, Yokoyama O

13:25 **425 ANTIFIBROTIC TREATMENT WITH NINTEDANIB RESTORES BLADDER DYSFUNCTION IN MICE WITH SPINAL CORD INJURY.**
Kwon J, Park D, Han S, Shimizu N, Takaoka E, Suzuki T, Kanai A J, Yoshimura N

13:30 **426 SELECTION OF SURGICAL METHODS FOR NEUROGENIC BLADDER IN CHILDREN**
Li S, Yao F, Zhou W, Jiang J, Liu X, Wang H, Chen J, Xu Y, Deng Z, Diao H

13:35 **427 MAIN ELEMENTS OF THE CONDITION NEUROGENIC DETRUSOR OVERACTIVITY INCONTINENCE: A REVIEW**
Costa J N, Lopes M V d O, Lopes M H B d M

13:40 **428 LEUPROLIDE ACETATE DECREASES DETRUSOR-SPHINCTER-DYSSYNERGIA IN MALE RATS WITH SPINAL CORD INJURY**
Medina-Aguinaga D, Munoz A, Cruz Y, Altamira-Camacho M, Guerrero J A, Quintanar-Stepano A, Quintanar-Stephano J L

13:45 **429 NURSING ASSESSMENT OF BLADDER AND BOWEL SYMPTOMS IN NEURO-REHABILITATION PATIENTS**
Flynn E, Saveoz M, Newman D K, Masterson J, Murphy M, Longo K, Otsuji-Miwa N, Jacobs B, Winters C, Carmine H, Magno A

13:50 **430 MALIGNANCIES OF SUPRAPUBIC CATHETER (SPC) TRACTS AND A REVIEW OF THE LITERATURE: A CASE SERIES**
Prattley S, New F, Davies M

14:00 - 15:30 **AN AFTERNOON WITH THE EXPERTS – FOR EARLY CAREER PROFESSIONALS ONLY!**
Chair: Dr Roger Roman Dmochowski (United States)
Speakers: Dr Lori A Birder (United States), Prof Francisco Cruz (Portugal), Enrico Finazzi Agrò (Italy), Dr Hann-Chorng Kuo (Taiwan), Prof Karl-Erik Andersson (United States)

14:00 - 15:30 **SESSION 22 (PODIUM SHORT ORAL) - NEUROMODULATION**
Chairs: Dr Jerzy B Gajewski (Canada), Dr Steven William Siegel (United States), Dr Kenneth Michael Peters (United States)

14:00 **431 A PROSPECTIVE, MULTICENTER, INTERNATIONAL CLINICAL TRIAL TO ASSESS THE EFFICACY AND SAFETY OF A NOVEL WIRELESS IMPLANTABLE TIBIAL NERVE STIMULATOR FOR THE TREATMENT OF PATIENTS WITH REFRACTORY OVERACTIVE BLADDER (OAB): 3-YEARS RESULTS**
Digesu A, Elneil S, Heesakkers J P F A, Van Kerrebroeck P

14:07 **432 ONE-YEAR OUTCOMES OF THE TREATMENT OF OVERACTIVE BLADDER WITH THE MINIATURIZED, RECHARGEABLE AXONICS R-SNM SYSTEM**
Blok B F M, Van Kerrebroeck P, De Wachter S G, Ruffion A, Van der Aa F, Perrouin-Verbe M, Jairam R, Elneil S

14:15 **433 HOW TO CONTROL SACRAL NEUROMODULATION IN PATIENTS WITH SACRAL DEFICIENCY OR PARTIAL SACRAL DEFECT 3D PRINTING TECHNOLOGY IS APPLIED (7 CASES REPORT)**
Gu Y, Fang W, Jiang C, Lv T, Lv J, Leng J, Xue W, Huang Y

14:22 **434 IMPROVEMENTS IN OVER ACTIVE BLADDER SYMPTOMS IN PATIENTS USING FUNCTIONAL ELECTRICAL STIMULATION (FES) OF THE COMMON PERONEAL NERVE**
Ware N, Georgopoulos P, Bull K, Seary C, Juckes F, Stevenson V, Panicker J N

14:30 **435 LONG-TERM NEUROSTIMULATOR PROGRAMMING IN A LARGE PROSPECTIVE TRIAL OF SACRAL NEUROMODULATION THERAPY FOR OVERACTIVE BLADDER PATIENTS**
Siegel S, Mangel J, Bennett J, Comiter C V, Zylstra S, Bird E, Griebling T L, Sutherland S E, Chase Berg K, Kan F

14:37 **436 DOES ELECTRICAL STIMULATION IN THE LOWER URINARY TRACT INDUCE DIURESIS?**
van der Lely S, Liechti M D, Popp W L, Kessler T M, Mehnert U

14:45 **437 LONG TERM OUTCOMES OF SACRAL NEUROMODULATION: A 23-YEAR EXPERIENCE**
Gandhi S, Almutairi S, Ali A, Cox A, Gajewski J

14:52 **438 CAN LUMBOSACRAL MAGNETIC RESONANCE IMAGING BE PERFORMED SAFELY IN PATIENTS WITH A SACRAL NEUROMODULATION DEVICE? AN IN-VIVO PROSPECTIVE STUDY**
Guzman-Negron J M, Pizarro-Berdichevsky J, Gill B C, Goldman H B

15:00 **439 COST-EFFECTIVENESS OF SACRAL NEUROMODULATION VS. BOTOX FOR REFRACTORY URGENCY URINARY INCONTINENCE: RESULTS FROM THE ROSETTA TRIAL**
Harvie H S, Amundsen C, Neuwahl S J, Honeycutt A A, Rogers R G, Sung V W, Lukacz E, Ferrando C A, Ellington D, Honeycutt E, Thomas S M, Mazloomdoost D

15:07 **440 SACRAL NERVE MODUALTION OUTCOMES IN PATIENTS WITH CHRONIC URINARY RETENTION AND VOIDING DYSFUNCTION OVER 5 YEARS - 388 PATIENT CASE STUDY**
Khan B, Gonzales G, Elneil S

15:15 **441 TINED LEAD TEST STIMULATION FOR SACRAL NEUROMODULATION. CLOSE FOLLOW UP WITH REPROGRAMMING DURING THE TEST PERIOD INCREASES NUMBER OF PATIENT RESPONDING TO TREATMENT**
Van de Borne S, Vaganée D, Vermandel A, De Wachter S G

15:22 **442 THE ECOIN™ IMPLANTABLE TIBIAL NERVE STIMULATION DEVICE FOR OVERACTIVE BLADDER SYNDROME IMPROVES QUALITY OF LIFE**
Sand P, English S, Lucente V, Clark M, Kaaki B, Gilling P, Meffan P, Sen S, MacDiarmid S

14:00 - 15:30 **SESSION 23 (PODIUM SHORT ORAL) - PELVIC ORGAN PROLAPSE**
Chairs: Dr Alex Digesu (United Kingdom), Dr Ariana Leigh Smith (United States), Dr Lilly Arya (United States)

14:00 **443 🏆 PRIZE AWARD: BEST IN CATEGORY PRIZE: THE LARGE CAPACITY BLADDER OVER 600 ML IS ASSOCIATED WITH ONGOING INCOMPLETE BLADDER EMPTYING FOLLOWING ANTERIOR AND/OR APICAL PROLAPSE REPAIR (2009-2015)**
Dobberfuhl A D, Shaffer R K, Goodman S N, Chen B

14:07 **444 IS IT POSSIBLE TO DEFINE RISK FACTORS FOR THE ANATOMICAL OR SYMPTOMATIC RECURRENCE OF PELVIC ORGAN PROLAPSE SURGICALLY CORRECTED USING NATIVE TISSUE?**
Vázquez Sarandeses A, Muñoz-Gálligo E, Masero-Casasola A R, García García-Porrero A, Gutiérrez-Vélez M C, Vielsa Gordillo I

14:15 **445 A STUDY ON HIATAL AREA AFTER SURGICAL REPAIR OF PELVIC ORGAN PROLAPSE**
Chan S C S, Cheung Y K R

14:22 **446 ARE THERE ANY ANATOMICAL FINDINGS TO PREDICT VOIDING DISFUNCTION SYMPTOMS IN WOMEN WITH ANTERIOR COMPARTMENT PELVIC ORGAN PROLAPSE?**
Martín-Martínez A, Diez-Itza I, Uranga S, Avila M, Lekuona A, García-Hernández J A

14:30 **447 SUCCESSFUL PREGNANCY AND OUTCOMES AFTER SACROHYSTEROPEXY FOR UTERINE PROLAPSE**
Adegoke T M M, Vragovic O M, Larrieux J R M M

14:37 **448 RETROSPECTIVE STUDY ESTIMATING THE ODDS OF MRI-DOCUMENTED PUBOVISCERAL MUSCLE TEAR IDENTIFIED BY INDEX FINGER PALPATORY ASSESSMENT IN POSTPARTUM WOMEN**
Sheng Y, Low L K, Liu X F, Ashton-Miller J A, Miller J M

14:45 **449 RAZOR-TYPE DERMATOMES ENABLE QUICK AND THIN VAGINAL DISSECTION WITH LESS BLEEDING IN COLPOCLEISIS**
Kato K, Adachi M, Hayashi Y, Ando R, Kawanishi H, Matsui H, Nagayama J, Hirabayashi H, Suzuki S, Hattori R

14:52 **450 A FIVE-YEAR OUTCOME USING THE ELEVATE™ ANTERIOR KIT FOR GRADES 3 AND 4 CYSTOURETHROCELE REPAIR IN A TERTIARY UROGYNAECOLOGY CENTRE**
Huang E, Koh W S, Han H C

15:00 **451 LEVATOR ANI MUSCLE AVULSIONS AND OUTCOMES OF MANCHESTER PROCEDURE**
Oversand S H, Staff A C, Volløyhaug I, Svenningsen R

15:07 **452 CORRELATION OF PELVIC ORGAN PROLAPSE STAGING WITH LOWER URINARY TRACT SYMPTOMS**
Liao Y, Ng S, Chen G

15:15 **453 CHARACTERIZATION OF TENSION-FREE VAGINAL MESH SURGERY AND LAPAROSCOPIC SACROCOLPOPEXY BASED ON NATIONWIDE DATABASE IN JAPAN**
Yoshizawa T, Yamaguchi K, Obinata D, Sugihara T, Yasunaga H, Matsui T, Mochida J, Matsui H, Sasabuchi Y, Fujimura T, Homma Y, Takahashi S

15:22 **454 A RANDOMIZED CONTROLLED TRIAL: LAPAROSCOPIC AND ROBOTIC ASSISTED LAPAROSCOPIC SACROCOLPOPEXY, LONG TERM OUTCOMES**
Illiano E, Zucchi A, De Rienzo G, Ditonno P, Costantini E

14:00 - 15:30 **SESSION 24 (PODIUM SHORT ORAL) - BASIC SCIENCE: OVERACTIVE BLADDER AND PAIN**
Chairs: Dr Robert M Levin (United States), Dr Kristene E Whitmore (United States), Dr Rita Valentino

14:00 **455 MOLECULAR DETERMINANTS OF AFFERENT SENSITIZATION IN THE FACE OF UROTHELIAL BARRIER DYSFUNCTION**
Carattino M, Rued A, Rooney J, Montalbetti N

14:07 **456 THE UROTHELIUM HAS TWO DISTINCT ATP RELEASE MECHANISMS THAT CONTRIBUTE DIFFERENTLY TO BLADDER FUNCTION**
Beckel J, Silberfeld A, Chavez B, Gianakas C, Tandoc B, De Groat W C

14:15 **457 A LOW-CARBOHYDRATE DIET PROLONGS VOIDING FUNCTION AND WEAKENS DETRUSOR MUSCLE CONTRACTION IN RATS**
Kataoka T, Hotta Y, Hamakawa T, Shibata Y, Maeda Y, Ugawa S, Yasui T, Kimura K

14:22 **458 THE UROTHELIAL FIBROGENESIS AND INFLAMMATION CYTOKINES IN PATIENTS OF IC/BPS WITH DIFFERENT CLINICAL PHENOTYPES AND SYMPTOM SEVERITY**
Jhang J, Lori B, Jiang Y, Hsu Y, Ho H, Kuo H

14:30 **459 EFFECTS OF LOW INTENSITY EXTRACORPOREAL SHOCKWAVE THERAPY ON INFLAMMATORY MEDIATORS AND CENTRAL SENSITIZATION ON CAPSAICIN INDUCED NONBACTERIAL PROSTATITIS MODEL IN RATS**
Wang H, Chuang Y, Chen Y

14:37 **460 SERUM C-REACTIVE PROTEIN LEVEL IS NOT ASSOCIATED WITH THE PROSTATIC INFLAMMATION BUT OVERACTIVE DETRUSOR IN PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA**
Inamura S, Ito H, Tsutsumiuchi M, Taga M, Tsuchiyama K, Matsuta Y, Aoki Y, Kobayashi M, Yokoyama O

14:45 **461 CHRONIC STRESS INCREASES PLASMATIC AND URINARY LEVELS OF NGF LEADING TO INCREASED BLADDER PAIN AND BLADDER HYPERACTIVITY. EXPERIMENTAL STUDY IN THE RAT.**
Dias B, Charrua A, Cruz F

14:52 **462 ATROPINE RESISTANCE AND ATP RELEASE IN HUMAN OVERACTIVE BLADDER**
Fry C H, McCarthy C, Ikeda Y, Kanai A J, Nishikawa N, Jabr R I

15:00 **463 NRF2 PLAYS A CRUCIAL ROLE IN THE PATHOGENESIS OF ISCHEMIA-INDUCED BLADDER OVERACTIVITY**
Funahashi Y, Majima T, Matsukawa Y, Takai S, Yoamamoto T, Gotoh M

15:07 **464 DYSREGULATION OF BETA 3-ADRENERGIC RECEPTOR AND PHOSPHOLAMBAN EXPRESSION IN OUTLET OBSTRUCTION-INDUCED DETRUSOR OVERACTIVITY**
Burkhard F, Besic M, Hashemi Gheinani A, Monastyrskaya K

15:15 **465 CIRCADIAN RHYTHM OF BLADDER CLOCK GENES IN LOWER URINARY TRACT DYSFUNCTION OF SPONTANEOUSLY HYPERTENSIVE RATS**
Kimura Y, Honda M, Sasaki R, Panagiota T, Morizane S, Hikita K, Osaki M, Okada F, Takenaka A

15:22 **466 SUPERIOR GLUTEAL VEIN SYNDROME: AN INTRAPELVIC CAUSE OF SCIATICA**
Cancelliere L, Li A L K, Marques R M, Fernandes G L, Sermer C, Kumar K, Afonso J S, Girão M J B C, Lemos N

14:00 - 15:30 **W28 ICS CORE CURRICULUM (FREE): UPDATE ON THE EVIDENCE FOR CONSERVATIVE MANAGEMENT OF FEMALE PELVIC FLOOR DYSFUNCTION**
Chair: Doreen McClurg (United Kingdom), Speakers: Chantale Dumoulin (Canada), Margaret Sherburn (Australia), Melanie Morin (Canada)

14:00 - 15:30 **W29 ICS CORE CURRICULUM (FREE): ETHICAL DILEMMAS IN THE CARE OF THE AGING PATIENT: A CASE-BASED INTERACTIVE WORKSHOP**
Chair: Heidi Moossdorff-Steinhauser (Netherlands), Speakers: Martha Spencer (Canada), Tamara Dickinson (United States), Anne Suskind (United States)

15:30 - 16:00 **COFFEE BREAK & EXHIBITION**

15:30 - 16:00 **RESIDENTS NETWORKING COFFEE**

16:00 - 16:30 **SP3: SUFU LECTURE - HISTORY OF NEUROMODULATION**
Speaker: Dr Kathleen C Kobashi (United States)

16:00 - 17:00 **RT5: BRAIN-GUT-BLADDER CONNECTION AND THE ROLE OF THE MICROBIOME**
Chair: Dr Toby Chai (United States)Speakers: Dr Margaret Mueller (United States), Jeremy Burton (Canada), David Klumpp (United States)

16:00 - 17:00 **RT6: THE LIFE OF THE AGEING BLADDER**
Chair: Prof Adrian Stuart Wagg (Canada)Speakers: Dr Neil M Resnick (United States), Dr Lori A Birder (United States), Dr Tomas Lindor Griebling (United States)

16:30 - 17:00 **SP4: IUGA LECTURE**
Speaker: Dr Lynsey Hayward (New Zealand)

19:30 - 00:00 **ANNUAL DINNER**

FRIDAY 31ST AUGUST

09:00 - 10:30 **SESSION 25 (PODIUM) - BEST CONSERVATIVE MANAGEMENT**
Chairs: Prof Steinar Hunskaar (Norway), Dr Jean F Wyman (United States), Dr Diane Borello-France

09:00 **467 A RANDOMISED CONTROL TRIAL OF CONTINUOUS LOW-DOSE ANTIBIOTIC PROPHYLAXIS TO PREVENT URINARY TRACT INFECTION IN ADULTS PERFORMING CLEAN INTERMITTENT SELF-CATHETERISATION**
Fisher H, Chadwick T, Oluboyede Y, Brennand C, McClurg D, Walton K, Thiruchelvam N, Pickard R

09:15 **468 PRIZE AWARD: CONSERVATIVE MANAGEMENT AWARD (JOINT): COMBINED BEHAVIORAL AND DRUG TREATMENT OF LOWER URINARY TRACT SYMPTOMS IN MEN: THE COBALT RANDOMIZED CONTROLLED TRIAL**
Burgio K, Kraus S, Johnson II T, Markland A, Vaughan C, Li P, Redden D, Goode P

09:30 **469 PRIZE AWARD: BEST IN CATEGORY PRIZE: MIND OVER MATTER; HEALTHY BOWELS, HEALTHY BLADDER: AN INDIVIDUALLY RANDOMIZED GROUP TREATMENT TRIAL**
Braun E J, Wise M E, Jansen S, Myers S, Sampene E, Li Z, Moberg D P, Rogers R G, Mahoney J E, Brown H W

09:45 **470 PRIZE AWARD: BEST IN CATEGORY PRIZE: HOW DOES URINARY INCONTINENCE INFLUENCE CARE DEPENDENCE AND CAREGIVING AMONG OLDER WOMEN IN THE COMMUNITY? RESULTS FROM A NATIONAL SAMPLE**
Yang E, Lisha N, Walter L, Huang A

10:00 **471 PRIZE AWARD: BEST IN CATEGORY PRIZE: IMPACT OF A STRONG DESIRE TO VOID ON GAIT IN CONTINENT AND INCONTINENT COMMUNITY-DWELLING OLDER WOMEN WHO HAVE EXPERIENCED FALL IN THE LAST YEAR**
Paquin M, Duclos C, Dubreucq L, Lapierre N, Rousseau J, Meunier J, Filiatrault J, Milot M, Morin M, Moffet H, Nadeau S, Dumoulin C

10:15 **472 AVAILABILITY OF PUBLIC TOILETS IN MAJOR INTERNATIONAL CITIES USING GEOGRAPHIC INFORMATION SYSTEMS**
Park Y S, Bliss D Z

09:00 - 10:30 **SESSION 26 (PODIUM SHORT ORAL) - NEUROGENIC BLADDER AND PEDIATRICS**
Chairs: Dr Daniela Marschall-Kehrel (Germany), Dr Stuart B Bauer (United States), Dr Stephen A Zderic

09:00 **473 EFFICACY AND MECHANISM OF ELECTRICAL PUDENDAL NERVE STIMULATION IN TREATING POST-RADICAL PROSTATECTOMY URINARY INCONTINENCE**
Wang S, Lv J, Li M, Lv T

09:07 **474 MULTIVARIATE ANALYSIS OF VARIANCE FOR MAXIMISING THE DIAGNOSING ACCURACY IN DIFFERENTIATING DU FROM BOO IN MALES**
Li R, Gammie A, Zhu Q, Nobouche M

09:15 **475 IS THE STRONG DESIRE TO VOID A SOURCE OF DIVERTED ATTENTION IN HEALTHY VOLUNTEERS?**
Morrison R, Hunter K F, Wagg A, Gibson W

09:22 **476 MULTIPLE SCLEROSIS AND URINARY VOIDING SYMPTOMS. A DEDICATED VOIDING SCORE.**
Helou E, Hassan T, Mouawad C, Naoum E, Zalaet J, Helou J, Abboud H, Nemr E, Koussa S

09:30 **477 TRENDS IN BLADDER AUGMENTATION PRIOR TO AND AFTER INTRODUCTION OF ONABOTULINUM TOXIN A THERAPY IN NEUROGENIC BLADDER POPULATION**
Crescenze I, Cameron A, Stoffel J, Barboglio Romo P, Gupta P, Clemens J Q

09:37 **478 IMPACT OF STIMULATION PARAMETERS ON SENSORY EVOKED POTENTIALS OF THE LOWER URINARY TRACT**
van der Lely S, Liechti M D, Schubert M, Kessler T M, Mehnert U

09:45 **479 THE IMPACT OF BACK PAIN AND BACK SURGERY ON THE OUTCOME OF SACRAL NEUROMODULATION TESTS**
Vaganee D, Van de Borne S, De Fré M, De Wachter S G

09:52 **480 NAVIGATION OF A TINED LEAD ELECTRODE USING A THREE-DIMENSIONAL (3D) MODEL OF SACRAL MORPHOMETRY – A NEW IMPLANTATION TECHNIQUE FOR SACRAL NEUROMODULATION**
Svihra sr. J, Benco M, Dusenka R, Svihra jr. J, Zelenak K, Hagovská M, Luptak J

10:00 **481 COUGH ASSOCIATED DETRUSOR OVERACTIVITY IN WOMEN WITH URINARY INCONTINENCE**
Sinha S, Lakhani D

10:07 **482 PRIZE AWARD: BEST IN CATEGORY PRIZE: TWENTY-FIVE YEARS' EXPERIENCE IN BLADDER OUTLET PROCEDURES IN CHILDREN WITH NEUROGENIC URINARY INCONTINENCE**
Noordhoff T C, van den Hoek J, Yska M J, Blok B F M, Scheepe J R

10:15 **483 CHILDHOOD ENURESIS – A MAJOR PREDICTOR FOR PELVIC FLOOR DISORDERS IN ADULTHOOD**
Al-Mukhtar Othman J, Åkervall S, Nilsson I, Milsom I

10:22 **484 ULTRASONIC FEATURES OF NEUROGENIC BLADDER IN CHILDREN**
Zhou W, Li S, Wang H, Chen J, Liu X, Jiang J, Xu Y, Deng Z, Diao H, Yao F

09:00 - 10:30 **SESSION 27 (PODIUM SHORT ORAL) - BASIC SCIENCE: STRESS URINARY INCONTINENCE AND BENIGN PROSTATIC HYPERPLASIA**
Chairs: Prof Christopher Henry Fry (United Kingdom), Michael DiSanto (United States)

09:00 **485 ACTIVATION OF SEROTONIN 5-HT2C AND 5-HT7 RECEPTORS ENHANCES THE URETHRAL CLOSURE REFLEX DURING SNEEZING IN RATS**
Suzuki T, Shimizu T, Kwon J, Takaoka E, Satoru Y, Sumino Y, Kitta T, Miyazato M, Miyake H, Yoshimura N

09:07 **486 FEASIBILITY OF SHEEP ANIMAL MODEL FOR MIDURETHRAL SLING SURGERIES**
Isali I, Khalifa A O, Shankar S, Dannemiller S, Horne W, Evancho-Chapman M, Akkus O, Hijaz A K

09:15 **487 TIME COURSE OF BEHAVIOR AND PHYSIOLOGY OF URINARY CONTINENCE RECOVERY AFTER VAGINAL DISTENSION IN RATS**
Palacios J L, Damaser M S, Munoz A, Perez C, Juarez M, Cruz Y

09:22 **488 ELECTRICAL STIMULATION OF THE PUDENDAL NERVE FOR NEUROREGENERATION IN A RAT MODEL OF STRESS INCONTINENCE**
Balog B, Hanzlicek B, Lin D L, Damaser M S

09:30 **489 THE USE OF AUTOLOGOUS SKELETAL MUSCLE DERIVED STEM CELLS IN THE TREATMENT OF INDUCED STRESS URINARY INCONTINENCE, AN EXPERIMENTAL STUDY**
Wadie B, Amer H, Sherry K, Gabr M

09:37 **490 ESTROGEN DEFICIENCY INDUCED BLADDER BLOOD FLOW CHANGES WHEN BLADDER CAPACITY WAS LOW VOLUME**
Imai Y, Yamaguchi O, Nomiya M, Takeda M

09:45 **491 THE ASSOCIATION BETWEEN URINARY INCONTINENCE AND VITAMIN D INSUFFICIENCY IN PREGNANCY**
Stafne S N, Johannessen H H, Salvesen K Å, Syversen U, Gustafsson M, Stunes A K, Mørkved S

09:52 **492 ACTIVATION OF PROSTAGLANDIN EP4 RECEPTORS IS AN IMPORTANT CONTRIBUTING FACTOR TO BLADDER OVERACTIVITY IN A RAT MODEL OF NON-BACTERIAL PROSTATIC INFLAMMATION**
Mizoguchi S, Wolf-Johnson A S, Suzuki T, Takaoka E, Mori K, Mimata H, DeFranco D B, Wang Z, Birder L A, Yoshimura N

10:00 **493 LONG-LASTING BLADDER OVERACTIVITY AND BLADDER AFFERENT NEURON HYPEREXCITABILITY IN RATS WITH CHEMICALLY-INDUCED PROSTATIC INFLAMMATION**
Ni J, Suzuki T, Mizoguchi S, Yoshimura N, Gu B

10:07 **494 COMPLEMENT ACTIVATION MECHANISM ACTIVATED BY AUTOANTIGEN RECOGNITION DURING GROWTH OF BENIGN PROSTATIC HYPERPLASIA**
Hata J, Onagi A, Tanji R, Takinami R, Hoshi S, Kurimura Y, Sato Y, Ogawa S, Kataoka M, Haga N, Ishibashi K, Kojima Y

10:15 **495 THE DISTRIBUTION AND FUNCTIONAL ROLE OF ADENOSINE RECEPTOR SUBTYPES IN THE BLADDER OF MALE RATS WITH BLADDER OUTLET OBSTRUCTION**
Takaoka E, Suzuki T, Mizoguchi S, Kurobe M, Ni J, Onozawa M, Miyazaki J, Nishiyama H, Yoshimura N

10:22 **496 MORPHOLOGICAL CHANGES OF MYOFIBROBLASTS IN DIFFERENTIATION PROCESS PROMOTE PROSTATIC FIBROSIS IN BENIGN PROSTATIC HYPERPLASIA**
Hata J, Onagi A, Tanji R, Takinami R, Hoshi S, Kurimura Y, Sato Y, Ogawa S, Kataoka M, Haga N, Ishibashi K, Kojima Y

09:00 - 10:30 **W30 POST PROSTATECTOMY URINARY INCONTINENCE: QUESTIONS THE PATIENTS ASK**
Chair: Carlos D'Ancona (Brazil), Speakers: Sender Herschorn (Canada), Andrew Gammie (United Kingdom), Giulio Del Popolo (Italy)

10:30 - 11:00 **COFFEE BREAK**

11:00 - 11:30 **SOA3: THE FUTURE OF ELECTROCEUTICALS – IMPLANTABLE DEVICES IN THE LOWER URINARY TRACT**
Chair: Prof Christopher Henry Fry (United Kingdom)Speaker: Warren Grill

11:30 - 11:35 **BREAK TO CHANGE HALLS**

11:35 - 12:35 **RT7: THE SCIENCE OF BEHAVIOURAL TREATMENTS FOR LUTS**
Chair: Dr Diane K Newman (United States)Speakers: Dr Jean F Wyman (United States), Dr Mary Happel Palmer (United States), Lisa Kane Low (United States)

11:35 - 12:35 **RT8: INCONTINENCE AND EMERGING TECHNOLOGY - ICS CONSIDERATIONS**
Chair: David Sussman (United States)Speakers: Andrea Branas (United States), Brian Murray (United States), Mrs Julia Herbert (United Kingdom)

11:35 - 12:35 **RT9: ROLE OF THE NERVOUS SYSTEM**
Chair: Prof Francisco Cruz (Portugal)Speakers: Prof Emmanuel Jean Chartier-Kastler (France), Dr Jeffrey Mogil (Canada), Thomas Chelimsky (United States)

11:35 - 12:35 **SP5: SPOTLIGHT ON ESSM: SEX, SENSATION, AND URINARY FUNCTION**
Speakers: Lior Lowenstein (Israel), Giovanni Corona

12:35 - 13:30 **LUNCH, E-POSTERS AND EXHIBITION**

12:35 - 13:30 **PELVIC FLOOR EXERCISE CLASSES FOR THE TREATMENT OF URINARY INCONTINENCE IN AGEING WOMEN**
Chairs: Dr Chantale L Dumoulin (Canada), Dr Margaret Joy Sherburn (Australia), Dr Jennifer Kruger (New Zealand) Speaker: Joanie Mercier (Canada)

12:35 - 13:30 **SESSION 28 (OPEN DISCUSSION EPOSTER) - OPEN DISCUSSION E-POSTERS 3**

12:40 **497 THE USE OF THE NEUROTROXINS IN THE PREVENTION OF NEUROGENIC DETRUSOR OVERACTIVITY**
Oliveira R, Coelho A, Chambel S S, Silva R, Cruz F, Duarte Cruz C

12:45 **498 SAFETY AND EFFICACY OF MIRABEGRON IN PATIENTS WITH PARKINSON'S DISEASE AND STORAGE LOWER URINARY TRACT SYMPTOMS: A SINGLE-CENTER SERIES**
Peyronnet B, Vurture G, Malacarne D, Sussman R, Palma J, Biagioni M C, Palmerola R, Rosenblum N, Frucht S, Kaufmann H, Nitti V, Brucker B M

12:50 **499 OUTCOMES OF INTRADETRUSOR BOTULINUM TOXIN INJECTION IN PATIENTS WITH PARKINSON'S DISEASE**
Vurture G, Peyronnet B, Feigin A, Biagioni M C, Gilbert R, Rosenblum N, Frucht S, Di Rocco A, Nitti V W, Brucker B M

12:55 **500 THE URODYNAMIC EFFECT OF CEREBROLYSIN IN AFTER SPINAL CORD INJURED FEMALE WISTAR RATS**
Hajebrahimi S, Abolhasanpour N, Rahnama'i M S, Eidi A

13:00 **501 NEUROMUSCULAR NICOTINIC RECEPTORS MEDIATE UPPER LUMBAR AND LOWER THORACIC SPINAL ROOT STIMULATION-INDUCED BLADDER CONTRACTIONS IN CANINES**
Salvadeo D M, Frara N, Tiwari E, Mazzei M, Braverman A S, Barbe M F, Ruggieri M R

13:05 **502 URINARY RETENTION AS THE FIRST MANIFESTATION OF MULTIPLE SYSTEM ATROPHY: CAN A UROLOGICAL PRESENTATION SUGGEST THE SITE OF NEUROLOGICAL LESION?**
Simeoni S, Sakakibara R, Uchiyama T, Henry H, Panicker J N

13:10 **503 BLADDER MANAGEMENT IN SPINAL CORD INJURY PATIENTS FROM AN ACADEMIC REFERRAL SPECIALTY HOSPITAL IN BRAZIL**
Gomes C M, Sucupira D G, Henriques J, Laferreira L S, Bessa Jr J, Sammour Z, Bellucci C H S, Srougi M, Bruschini H

13:15 **504 URODYNAMIC FINDINGS IN A COHORT OF PATIENTS WITH SCA7 REPORTING LOWER URINARY TRACT SYMPTOMS.**
Uchiyama T, Ribeiro J, Georgopoulos P, Pakzad M H, Yamanishi T, Sakakibara R, Kuwabara S, Hirata K, Giunti P, Panicker J N

13:20 **505 CLINICAL AND URODYNAMIC RISK FACTORS FOR RECURRENT URINARY TRACT INFECTIONS IN PATIENTS WITH MULTIPLE SCLEROSIS**
Castro-Díaz D M, Vírseda-Chamorro M, Salinas-Casado M, Méndez-Rubio S, Esteban-Fuertes M, Moreno-Sierra J

13:25 **506 OBTURATOR TO PELVIC NERVE TRANSFER ONE YEAR AFTER BLADDER DECENTRALIZATION RESTORES BLADDER SENSATION AND EMPTYING FUNCTION IN CANINES.**
Tiwari E, Braverman A S, Hobson L, Salvadeo D M, Pontari M, Barbe M F, Ruggieri M R

12:40 **507 SACRAL NEUROMODULATION: THE USE OF A CURVED LEAD DELIVERS MORE ELECTRODE CONFIGURATIONS TO BE USED AND THEREFORE A MORE OPTIMAL LEAD PLACEMENT**
Vaganee D, Van de Borne S, De Wachter S G

12:45 **508 SACRAL NEUROMODULATION: STANDARDIZED ELECTRODE PLACEMENT TECHNIQUE: TWO-YEAR OUTCOMES, COMPARING THE USE OF THE STRAIGHT VERSUS CURVED STYLET**
Vaganee D, Van de Borne S, De Win G, De Wachter S G

12:50 **509 THE USE OF A SENSORY PASSPORT ON DIFFERENT PARAMETER SETTINGS DURING THE SACRAL NEUROMODULATION PROCEDURE**
Van de Borne S, Vaganée D, Vermandel A, De Wachter S G

12:55 **510 PREVENTION OF NEUROGENIC DETRUSOR OVERACTIVITY IN SPINAL CORD TRANSECTED RATS WITH EARLY ANTICHOLINERGIC TREATMENT**
Przydacz M, Loutochin G, Biardeau X, Cammisotto P, Zimoch J, Campeau L, Corcos J

13:00 **511 FESOTERODINE REDUCES AUTONOMIC DYSREFLEXIA IN INDIVIDUALS SPINAL CORD INJURY WITH NEUROGENIC DETRUSOR OVERACTIVITY**
Walter M, Ramirez A L, Lee A H X L, Rapaport D, Kavanagh A, Krassioukov A V

13:05 **512 BRAIN CONTROL OF ILEAL ORTHOTOPIC NEOBLADDER**
Huang H, Wu W

13:10 **513 THE SUBTHALAMIC STIMULATION INHIBIT BLADDER CONTRACTION BY MODULATING LOCAL FIELD POTENTIAL AND CATECHOLAMINE IN THE MEDIAL PREFRONTAL CORTEX.**
Yamamoto T, Sakakibara R, Uchiyama T, Kitajo K, Kuwabara S, Yamaguchi A

13:15 **514 INTERSTITIAL CYSTITIS INTRAVESICAL THERAPY: COCKTAIL THERAPY VERSUS COMBINED SODIUM HYALURONATE AND CHONDROITIN SULFATE (IALURIL): WHICH ONE TO USE?**
Banakhar M

13:20 **515 SIMPLE PROCESS TO ASSES WOMEN WITH PELVIC PAIN, DIFFUSE VULVAR PAIN AND/OR DYSPAREUNIA**
del Amo E, Naranjo-Ortiz C, Barrera E, Montes A

13:25 **516 POTASSIUM CHLORIDE TEST AS A POSSIBLE PREDICTOR OF HYDRODISTENTION EFFICACY IN PATIENTS WITH BLADDER PAIN SYNDROME/ INTERSTITIAL CYSTITIS**
Gülpinar Ö, Esen B, Akpinar Ç, Baklaci U, Gökçe M I, Süer E, Bedük M Y

12:40 **517 ANGIOGENESIS IN BLADDER TISSUES ARE STRONGLY CORRELATED WITH URINARY FREQUENCY AND BLADDER PAIN IN PATIENTS WITH INTERSTITIAL CYSTITIS**
Furuta A, Igarashi T, Suzuki Y, Yamamoto T, Egawa S, Yoshimura N

12:45 **518 ARTEMIN: A NOVEL TARGET FOR TREATMENT OF INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME**
Kullmann F A, McDonnell B, Wolf-Johnston A S, Lynn A, Rodriguez L, Birder L A

12:50 **519 PUDENDAL NERVE NEURALGIA: SYMPTOMS AND MINIMAL INVASIVE TREATMENTS.**
López-Fando Lavalle L, Fernández A A, Gómez de Vicente J M, Sánchez Guerrero C, Jiménez-Cidre M A, Burgos Revilla J

12:55 **520 PROFILE OF WOMEN WITH CHRONIC PELVIC PAIN: AN APPROACH BEYOND PAIN**
Massaneiro T J, Romano R, Petterle R R, Assis G M, Nascimento R R, Bittelbur C, Mueller C V, de Fraga R

13:00 **521 INCREASED URINARY BLADDER SUSCEPTIBILITY TO INFECTIONS THROUGH MODULATION OF UROTHELIAL NADPH OXIDASE (NOX)-ASSOCIATED OXIDATIVE STRESS IN A CANINE MODEL OF LOWER SPINAL CORD INJURY**
Frara N, Salvadeo D M, Tiwari E, Mazzei M, Braverman A S, Barbe M F, Wu C, Ruggieri M R

13:05 **522 ONE TREATMENT OPTION OF LOWER URINARY TRACT SYMPTOMS IN PATIENTS WITH PARKINSON'S DISEASE: IS THE EFFECT OF ADENOSINE A2A RECEPTOR ANTAGONIST ISTRADEFYLLINE TO LOWER URINARY TRACT SYMPTOMS SUSTAINABLE IN THE LONG TERM?**
Kitta T, Kanno Y, Chiba H, Higuchi M, Ouchi M, Togo M, Takahashi Y, Moriya K, Yabe I, Sasaki H, Shinohara N

13:10 **523 OVERACTIVE BLADDER PATIENTS WITH MORE SEVERE URGENCY HAD HIGHER SATISFACTION WITH MIRABEGRON DOSE ESCALATION FROM 25 MG TO 50 MG**
Liao C, Lee Y, Jiang Y, Kuo H

13:15 **524 ADDING ANTIMUSCARINIC OR MIRABEGRON INCREASES THE THERAPEUTIC EFFECT IN OVERACTIVE BLADDER PATIENTS TREATED WITH 100 U ONABOTULINUMTOXINA**
Wang C, Lee Y, Jiang Y, Kuo H

12:40 **525 INVESTIGATING THE ROLE OF KYNURENINE/AHR SIGNALING IN INTERSTITIAL CYSTITIS USING A CYSTITIS RAT MODEL**
Maeda K, Hotta Y, Kataoka T, Maeda Y, Hamakawa T, Sasaki S, Yasui T, Kimura K

12:45 **526 EFFECTS OF INTRAVESICAL RESINIFERATOXIN AND ETHANOL ON UROTHELIAL MEDIATOR RELEASE AND CONTRACTILE BLADDER RESPONSES**
Smith K, McDermott C, Sellers D, Chess-Williams R

12:50 **527 PRAZOSIN USED TO MANAGE LUTS IN MEN WITH PROSTATE CANCER REDUCES RISK OF BIOCHEMICAL RELAPSE FOLLOWING RADIOTHERAPY**
Hart J, Spencer B, McDermott C, Chess-Williams R, Sellers D, Christie D, Anoopkumar-Dukie S

12:55 **528 CLASSIFICATION OF THE A1-ADRENOCEPTORS ON THE PORCINE SUPERIOR VESICAL ARTERY.**
Nilsson D, Chess-Williams R, Sellers D

13:00 **529 NITRIC OXIDE CENTRALLY INDUCES FREQUENT URINATION IN RATS**
Shimizu T, Ono H, Shimizu S, Higashi Y, Zou S, Yamamoto M, Aratake T, Hamada T, Nagao Y, Ueba Y, Honda M, Saito M

13:05 **530 FIRST STAGES OF DIABETES TYPE 2 EFFECTS IN THE BLADDER; TO WHICH EXTENT ANTIOXIDANT TREATMENT CAN BE BENEFICIAL FOR THE BLADDER TISSUE?**
Tsounapi P, Honda M, Shimizu R, Nishikawa R, Teraoka S, Kimura Y, Yumioka T, Yamaguchi N, Iwamoto H, Morizane S, Hikita K, Takenaka A

13:10 **531 PRE-JUNCTIONAL M1 RECEPTOR- A THERAPEUTIC TARGET FOR UNDERACTIVE BLADDER**
Pradeep T, Christopher C, William C d g, Michael C, Naoki Y

13:15 **532 HYPERPOLARIZATION-ACTIVATED CYCLIC NUCLEOTIDE-GATED CATION (HCN) CHANNELS CONSTRAIN THE HUMAN DETRUSOR CONTRACTILITY**
Pradeep T, Mahendra K, Naoki Y

13:20 **533 INDIRECT B-ADRENOCEPTOR-INDUCED RELAXATION OF RAT BLADDER SMOOTH MUSCLE REMAINS UNALTERED IN A STATE OF INFLAMMATION AND SEEMS TO BE INDEPENDENT OF NITRIC OXIDE**
Chan S, Aronsson P, Carlsson T, Winder M

13:25 **534 THE IMPACT OF A FAMILIARIZATION SESSION ON PELVIC FLOOR MUSCLE DYNAMOMETRY OUTCOMES IN WOMEN**
Berube M, Czyrnyj C, McLean L

12:40 **535 MONITORING IN VIVO HYPOGASTRIC NERVE ACTIVITY DURING BLADDER FILLING IN CANINES.**
Tiwari E, Barbe M F, Lemay M, Salvadeo D M, Wood M, Mazzei M, Musser L, Delalic Z, Braverman A S, Ruggieri M R

12:45 **536 NONLINEAR MATERIAL PARAMETERS OF THE BLADDER AND RECTUM BASED ON HISTOLOGICAL AND EXPERIMENTAL DATA.**
Rynkevic R, Ferreira J, Martins P, Mascarenhas T, Fernandes A A

12:50 **537 FACE, CONTENT, AND CONSTRUCT VALIDATION OF ENDOSCOPIC NEEDLE INJECTION (ENI) SIMULATOR FOR TRANSURETHRAL BULKING AGENT IN TREATMENT OF STRESS URINARY INCONTINENCE.**
Farhan B, Ghoniem G, Do R, Perez C, Choi H

12:55 **538 CAN ICONS EVOKE BLADDER SENSATIONS?**
Gómez de Vicente J M, Sánchez D, Lorca J, López-Fando Lavalle L, Jiménez-Cidre M A, Burgos F J

13:00 **539 VALIDATION OF ELECTRONIC (WEB-BASED AND SMARTPHONE) ADMINISTRATION OF MEASURES OF PELVIC FLOOR DYSFUNCTION**
Grimes C, Brown H, Antosh D, Oliphant S, Yurteri-Kaplan L, Kim-Fine S, Melamud G, Chung D

13:05 **540 FREQUENCY VOLUME CHART IN THE ILLITERATE POPULATION : A SIMPLE SOLUTION**
Vasudeva P, Kumar N, Madersbacher H

13:10 **541 SENSATION EVENT METRICS AND DESCRIPTORS DURING NON-INVASIVE ORAL HYDRATION**
Naimi H A, Nagle A S, Vinod N N, Kolli H, Sheen D, Balthazar A, De Wachter S G, Speich J E, Klausner A P

13:15 **542 THE IMPACT OF HEALTH LITERACY ON UTILIZATION OF PFDI-20 AND PFIQ-7**
Spencer J, Hadden K, Oliphant S

12:40 **543 QUANTIFICATION OF AGING EFFECTS ON URETHRAL MORPHOLOGY USING MRI**
Masteling M, Chen L, DeLancey J O L, Swenson C W

12:45 **544 DEVELOPMENT OF A NON-INVASIVE EXTERNAL COMPRESSION PROTOCOL TO QUANTIFY DYNAMIC ELASTICITY IN AN ISOLATED WORKING PIG BLADDER**
Balthazar A, Cullingsworth Z, Speich J E, Klausner A

12:50 **545 COMPARATIVE-FILL URODYNAMICS REVEALS DYNAMIC ELASTICITY IN HEALTHY BLADDERS BUT NOT BLADDERS WITH DETRUSOR OVERACTIVITY**
Cullingsworth Z, Balthazar A, Nagle A S, Klausner A, Speich J E

12:55 **546 CLITORAL MASSES**
Ghigo J, Kocjancic E

13:00 **547 VAGINAL LENGTHS: HOW DO THEY VARY SIGNIFICANTLY?**
Haylen B, Sivagnanam V, Lim W H, Kerr S

13:05 **548 IS OBSTRUCTION OF ILEAL CONDUIT AFTER PARASTOMAL HERNIA REPAIR WITH PORCINE DERIVED TISSUE MATRIX STRATTICE™ A VALID CONCERN?**
Kotes S, Kocadag H, Greenwell T J, Ockrim J L, Wood D

13:10 **549 ANATOMICAL VARIATIONS OF THE INTRAPELVIC COURSE OF THE SUPERIOR GLUTEAL VESSELS AND THEIR RELATIONSHIP TO THE LUMBOSACRAL PLEXUS: A CADAVER STUDY**
Cancelliere L, Li A L K, Marcu I, Fernandes G L, Sermer C, Shaubi M, Balica A, Morozov V, Campian E C, Solnik M J, Girão M J B C, Lemos N

13:15 **550 THE RELATION OF SACRAL NERVE ROOTS TO THE PIRIFORMIS MUSCLE**
Li A L K, Cancelliere L, Sermer C, Balica A, Campian E C, Morozov V, Fernandes G L, Girão M J B C, Moretti-Marques R, Shaubi M, Peng P, Lemos N

13:20 **551 ONE-YEAR URODYNAMICS AND MOBILITY OUTCOMES OF PATIENTS SUBMITTED TO FEMORAL, SCIATIC AND PUDENDAL NEUROMODULATION WITH THE LAPAROSCOPIC IMPLANTATION OF NEUROPROSTHESIS (LION) PROCEDURE**
Lemos N, Fernandes G L, Morgado-Ribeiro A, Souza P, Lira M, Contiero W, Barbosa A C, Croos V, Petrilli R, Oliveira A, Suzigan E, Girão M J B C

12:40 **552 RELATIONSHIP OF UPPER BODY COMPOSITION AND URINARY INCONTINENCE IN BRAZILIAN WOMEN**
Ferreira R, Sacramento J, Brasil C, Dias C, Oliveira dos Santos C, Plácido C, Souza I, Leony J C, Porto M, Lordelo P

12:45 **553 FUZZY MODEL OF PELVIC FLOOR MUSCLES DURING SQUATTING**
Oliveira dos Santos C, Lordelo P, Lopes da Silva M, Plácido C, Carvalho J, Matos Aguiar T, Moret M, Brasil C, Lemos A, Borges Barros Perreira H

12:50 **554 ANALYSIS OF THE ELECTROMYOGRAPHY OF THE PELVIC FLOOR MUSCLES IN RESPONSE TO THE IMPACT CAUSED BY THE VERTICAL JUMP**
Plácido C, Brasil C, Lemos A, Oliveira C, Mello L, Luso A, Dória M, Liony C, Lordelo P

12:55 **555 ELECTRICAL ACTIVITY OF PELVIC FLOOR MUSCLES OF CONTINENT AND INCONTINENT WOMEN IN DIFFERENT POSITIONS: PRELIMINARY RESULTS**
Alvares C, Lemos A, Matos Y C C, Passos J, Brasil C, Campos R, Novais L, Sodré D, Matos J C, Lordelo P

13:00 **556 RELATION OF BODY IMAGE, GENITAL SELF-IMAGE AND SEXUAL FUNCTION IN YOUNG ADULT WOMEN**
Trinchão R, Matos J C, Dória M, Gomes T, Cerqueira T, Porto M, Baqueiro P, Dias C, Brasil C, Lordelo P

13:05 **557 USE OF ULTRASOUND URODYNAMICS TO IDENTIFY A POTENTIAL SHAPE-MEDIATED SUB-TYPE OF OAB**
Anna N, Stephanie C, Rachel B, Naomi V, Andrea B, Laura C, Ashley C, Adam K, John S

13:10 **558 A STUDY OF SEXUAL FUNCTION EVALUATED BY THE PREGNANCY SEXUAL RESPONSE INVENTORY (PSRI) AMONG WOMEN WITH GESTATIONAL DIABETES MELLITUS DIAGNOSIS**
Rudge M V C, Nunes S K, Rudge C V C, Quiroz S C B V, Prudencio C B, Pinheiro F A, Heliodoro M L A, Pascon T, Sartorão Filho C I, Calderon I M P, Medolago A, Barbosa A M P

13:15 **559 MORPHOLOGICAL ANALYSIS OF THE RECTUS ABDOMINIS MUSCLE IN PREGNANT WOMEN WITH HYPERGLYCEMIA AND URINARY INCONTINENCE**
Rudge M V C, Vesentini G, Piculo F, Harada B S, Leite A P S, Fernandes J N, Pinto C G, Damasceno D C, Matheus S M M, Barneze S, Barbosa A M P, Marini G

12:40 **560 IS THERE A DIFFERENCE IN THE PRESSURE OF PELVIC FLOOR MUSCLE IN WOMEN OVER 40 YEARS?**
Angelo P, Varella L, Magalhães A, Micussi M T

12:45 **561 IS THERE A DIFFERENCE IN PELVIC FLOOR MUSCLE PRESSURE IN NATURAL AND SURGICAL MENOPAUSE?**
Angelo P, Leitão A, Oliveira M, Nascimento N, Magalhães A, Micussi M T

12:50 **562 TREATMENT OF INCREASED BLADDER SENSATION AND URGENCY WITH INTERFERENCIAL CURRENTS**
Naranjo-Ortiz C, Ramos-Alvarez J J, Polo-Portes C

12:55 **563 THE OUTCOMES OF MODIFIED WALLACE ANASTOMOSIS TECHNIQUE. CAN IT REDUCE STRICTURE RISK OF ANASTOMOSIS?**
Zümrütbas A E, Özlülerden Y, Çelen S, Aybek Z

13:00 **564 COMPARISON OF PROPHYLAXIS PROTOCOLS AGAINST RECURRENT URINARY TRACT INFECTION IN KIDNEY TRANSPLANT RECIPIENTS**
Lorenzo-Gómez M F, Parra-Serván P, Fraile-Gómez M P, Padilla-Fernández B, Mirón-Canelo J A, García-Cenador M B, Rosety-Rodríguez J M, Álvarez-Ossorio Fernández J L

13:05 **565 OBSTETRICAL ANAL SPHINCTER INJURIES AND THE NEED FOR ADEQUATE CARE**
Elliot V, Yaskina M, Schulz J

13:10 **566 THE EFFICACY OF BT/ PFMT IN ELDERLY WOMEN WITH ANY URINARY INCONTINENCE REFRAINING FROM SURGERY, A PROSPECTIVE STUDY**
Wadie B S, Meawad E, Abdelazim S, Ibrahim A

13:15 **567 FUNCTIONAL OUTCOMES OF ILEAL ORTHOTOPIC NEOBLADDER : EVALUATED BY BLADDER DIARY**
Choo H, Lee D, Yoon H

13:20 **568 SCIENTIFIC EVIDENCE FOR PELVIC FLOOR DEVICES**
Te Brummelstroete G, Loohuis A M M, Wessels N J, Van Summeren J, Westers H, Blanker M H

13:25 **569 MEASUREMENTS OF BLADDER VOLUME USING BLADDER SCANNER AND INTERMITTENT CATHETERIZATION**
Zhao L, Liao L

12:40 **570 NOVEL STRETCHABLE FINNED SACRAL SPINAL NEUROSTIMULATION LEAD IN COMPARISON TO A TINED LEAD: EXTRACTION CHARACTERISTICS IN AN ANIMAL MODEL.**
Siegel S, Benson K

12:45 **571 COMPARISON OF SACRAL NEUROMODULATION LEADS EXPOSED TO PULL FORCES IN A CONTROLLED IN-VITRO ENVIRONMENT.**
Benson K, Goldman H B, Siegel S

12:50 **572 WIRELESS REAL-TIME SENSOR PLATFORMS FOR BLADDER AND BOWEL PRECLINICAL RESEARCH MODELS**
Majerus S, McAdams I, Smiley A, Bourbeau D, Damaser M S

12:55 **573 THE EFFECT OF TECHNICAL TRAINING FOR INTERDISCIPLINARY CARE TEAMS ON PATIENTS WITH LOWER URINARY TRACT SYMPTOMS**
Mizoguchi A, Otani M, Hall B, Mimata H, Sato K, Utsunomiya S

13:00 **574 RESULTS OF PRELIMINARY TRIAL OF A DEVICE TO REMOTELY MONITOR CATHETER OUTPUT**
Mosli-Lynch C

13:05 **575 PRELIMINARY TRIAL OF A DEVICE TO REMOTELY MONITOR AND ASSES VOIDING**
Mosli-Lynch C

13:10 **576 A NOVEL COMPRESSION TECHNIQUE ON URETHRA BY TURKISH CONTINENCE DEVICE FOR MALE URINARY INCONTINANCE**
Odabas Ö, Sancak I G, Morgülle F, Kasap Y, Mahmut Z, Ölçücüoglu E, Tastemur S, Zengin N

13:15 **577 CONTINENCE APP: CONSTRUCTION AND VALIDATION OF SOFTWARE FOR URINARY INCONTINENCE PREVENTION IN POSTPARTUM WOMEN**
Oriá M O B, Vasconcelos C T M, Saboia D M, Bezerra K d C, Vasconcelos Neto J A, Lopes M H B d M, Firmiano M L V, Nascimento S L, Frota I P, Bizarria L B, Lima A C, Augusto K L

13:20 **578 MONITORING PERFORMANCE OF SACRAL NEUROMODULATION SYSTEMS IN A REAL-WORLD POPULATION: THE PRODUCT SURVEILLANCE REGISTRY**
Kreder K, Benson K, Miller A, Siddiqui N, Cameron A, Katz D, Woo H, Kaufman M R, Lai H, Castaño J C, Sandberg K, Weaver T

13:25 **579 EVALUATION OF BLADDER BEHAVIOR, SEXUAL FUNCTION AND PELVIC FLOOR MUSCLE FUNCTION OF INDIVIDUALS OF PATIENTS WITH PARKINSON'S DISEASE.**
Pereira A, Correa G, Viana E, Souza V, Micussi M T, Barros W, Braga V, Paixão J, Magalhães A

12:40 **580 ADHERENCE TO TRANSANAL IRRIGATION BY NAVINA SYSTEMS.**
Sigvardsson S, Elmroth K, Aberg Hakansson M

12:45 **581 TRANSANAL IRRIGATION WITH NAVINA SMART: BUILDING THERAPY KNOWLEDGE FOR BETTER PATIENT OUTCOME**
Sigvardsson S, Emmanuel A

12:50 **582 THE POTENTIAL FOR PATIENT-REPORTED DATA ON TRANSANAL IRRIGATION: BETTER UNDERSTANDING OF DISEASE, BETTER CLINICAL TRIALS, BETTER PRESCRIPTION OF IRRIGATION PARAMETERS**
Sigvardsson S, Emmanuel A

12:55 **583 EFFECT OF PAD USE ON QUALITY OF LIFE IN WOMEN WITH URINARY INCONTINENCE: A MIXED METHODS STUDY**
McCreary M, Hunter K F, Rajabali S, Milsom I, Wagg A

13:00 **584 CONTAINMENT PRODUCTS AND QUALITY OF LIFE IN MEN WITH URINARY INCONTINENCE: AN EXPLORATORY, QUALITATIVE STUDY**
Gartner S, Hunter K F, McCreary M, Lindeman C, Rajabali S, Wagg A

13:05 **585 TIMELY DISCHARGE AFTER GYNECOLOGIC SURGERY: A QUALITY IMPROVEMENT ASSESSMENT**
Jansen S, Braun E J, Brown H W, Heisler C A, McAchran S E, Drewry A, Giles D L

13:10 **586 NURSES' AND NURSING ASSISTANTS' KNOWLEDGE, BELIEFS, AND ATTITUDES ABOUT URINARY INCONTINENCE AND THE EFFECT OF EDUCATION: A SYSTEMATIC REVIEW**
Ostaszkiewicz J, Tomlinson E

13:15 **587 ULTRASOUND IMAGING USE IN THE CLINICAL PRACTICE OF UNITED STATES PELVIC PHYSICAL THERAPISTS**
Shelly E R, Smith K, Reimer R

13:20 **588 OPTIMISING THE URODYNAMICS REFERRAL PATHWAY AND THE MANAGEMENT OF LOWER URINARY TRACT SYMPTOMS**
Tharakan T, Gbolahan O, Aldiwani M, Wazait H

13:25 **589 COMPREHENSIVE CONTINENCE CARE: DEVELOPING SPECIALIZED NAVIGATION PROGRAMMING TO INCREASE FECAL AND URINARY INCONTINENCE PATIENT SCREENING RATES AND ENGAGEMENT**
Upton MA J, Kaminski MD MBA J, Bedon APN A, George MD S, Estrada MD J. J

12:40 **590 THE TRANSVAGINAL MESH MESS: PATIENT VOICE AND GLOBAL EVOLUTION IN A WORLD OF WORRY**
Palm S

12:50 **591 PREVALENCE AND PATIENTS' BEHAVIOR OF LOWER URINARY TRACT SYMPTOMS IN MEDICAL CHECKUP EXAMINEE POPULATION: DIFFERENCES BETWEEN MALES AND FEMALES**
Kinjo M, Gamou S, Okegawa T, Fukuhara H

12:55 **592 A COMPARISON OF THE OUTPATIENT REIMBURSEMENT FOR INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME AND IRRITABLE BOWEL SYNDROME TREATMENT IN TAIWAN: A NATIONWIDE POPULATION-BASED STUDY**
Chang K, Lin H, Wu H, Lee M

13:00 **593 A COMPARISON OF THE OUTPATIENT REIMBURSEMENT FOR INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME AND FIBROMYALGIA TREATMENT IN TAIWAN: A NATIONWIDE POPULATION-BASED STUDY**
Lin H, Chang K, Lee M, Wu H

13:05 **594 MULTIPLE SCLEROSIS PATIENTS WITH LOWER URINARY TRACT SYMPTOMS. IS THERE AN ADAPTATION MECHANISM?**
Helou E, Mouawad C, Zalaet J, Hassan T, Naoum E, Nemr E, Helou J, Abboud H, Koussa S

13:10 **595 A CROSS-SECTIONAL STUDY ON UROLOGIC QUALITY OF LIFE IN MULTIPLE SCLEROSIS PATIENTS. WHICH URINARY SYMPTOMS ARE TO BLAME?**
Helou E, Naoum E, Mouawad C, Zalaet J, Hassan T, Nemr E, Helou J, Abboud H, Koussa S

13:15 **596 CORRELATION BETWEEN DISABILITY STATUS AND QUALITY OF LIFE IN MULTIPLE SCLEROSIS PATIENTS WITH URINARY INCONTINENCE: A PILOT STUDY**
Ersin A, Tutuncu M, Mutluay F

13:20 **597 MANAGEMENT OF GENITOURINARY SYNDROME OF MENOPAUSE THROUGH THE COMBINATION OF VAGINAL AND URETHRAL LASER. A 12 MONTHS FOLLOW-UP STUDY**
Gaspar A, Silva J, Brandi H

13:25 **598 COMPARISONS OF HEALTH RELATED QUALITY OF LIFE BETWEEN OVERACTIVE BLADDER-WET AND -DRY WOMEN BASED ON BLADDER DIARY**
Hsiao S, Chen C, Chang T, Lin H

12:40 **599 VALIDATION OF THE OAB-QUESTIONNAIRE ON QUALITY OF LIFE OF GREEK PATIENTS WITH OVERACTIVE BLADDER**
Kontogiannis S, Athanasopoulos A, Tsagkarakis M, Kontodimopoulos N

12:45 **600 A COMMUNITY-BASED EPIDEMIOLOGICAL SURVEY OF LOWER URINARY TRACT SYMPTOMS IN TAIWANESE RESIDENTS AGED 40 YEARS AND ABOVE**
Ng S, Hu S, Chen G

12:50 **601 BODY IMAGE EVALUATION: VALIDATION OF BODY APPRECIATION SCALE FOR BRAZILIAN WOMEN IN MIDDLE AGE WITH URINARY INCONTINENCE**
Caetano A S, Simon F d O, Lopes M H B d M

12:55 **602 NAVIGATED INTAKE FOR PELVIC PAIN: IMPROVED CARE FOR THE PATIENT ... AND PROVIDER**
Mitchell A, De E, Crosby E

13:00 **603 THE DEVELOPMENT AND VALIDATION OF TWO DIAGNOSTIC METHODS FOR AN OPEN VAGINA**
Mortiers X, Neels H, De Graaf S, De Wachter S G, Tjalma W, Vermandel A

13:05 **604 PUDENDAL BLOCK EFFECTIVELY RELIEVES EARLY POST-OPERATIVE URINARY CATHETER RELATED PAIN AND BLADDER DISCOMFORT AFTER ROBOT-ASSISTED RADICAL PROSTATECTOMY (RARP): A SINGLE CENTER COHORT STUDY**
Erdogru T, Onur R, Keles A

13:10 **605 PATIENT SATISFACTION WITH OPERATIVE OUTCOMES FOLLOWING MID-URETHRAL TAPE SURGERY FOR STRESS URINARY INCONTINENCE**
Sambandan N, Nair R

13:15 **606 IS PELVIC FLOOR MUSCLE TRAINING EFFECTIVE FOR SYMPTOMS OF OVERACTIVE BLADDER IN WOMEN? A SYSTEMATIC REVIEW**
Bø K, Fernandes A C N L, Duarte T B, Brito L G O, Ferreira C H J

13:20 **607 NON-UROLOGICAL TREATMENTS FOR PRIMARY BLADDER NECK OBSTRUCTION**
Camerota T C, Leoni M

13:25 **608 EVALUATING OF PELVIC FLOOR MUSCLE FUNCTIONS USING TWO-DIMENSIONAL TRANSPERINEAL ULTRASOUND IN PELVIC ORGAN PROLAPSE**
Ouchi M, Kitta T, Kanno Y, Higuchi M, Togo M, Takahashi Y, Moriya K, Shinohara N, Kato K

13:30 - 14:30 SESSION 29 (PODIUM SHORT ORAL) - INTERSTITIAL CYSTITIS / BLADDER PAIN SYNDROME 2

Chairs: Dr Tomohiro Ueda (Japan), Dr Christopher K Payne (United States), David Klumpp (United States)

13:30 **609 THE IMPACT OF THE USE OF VACCINE AGAINST RECURRENT URINARY TRACT INFECTIONS IN FRAIL ELDERLY PATIENTS**
Lorenzo-Gómez M F, Padilla-Fernández B, González-Casado I, de Dios-Hernández J M, Blanco-Tarrío E, Martínez-Huélamo M, Núñez-Otero J J, Hernández-Hernández D, García-Cenador M B, Castro-Díaz D M

13:37 **610 POSSIBLE USEFULNESS OF BLOOD INFLAMMATORY MARKER C-REACTIVE PROTEIN AS A BIOMARKER FOR HUNNER LESIONS IN INTERSTITIAL CYSTITIS**
Miyata Y, Matsuo T, Araki K, Nakamura Y, Sagara Y, Ohba K, Sakai H

13:45 **611 THE ROLE OF VIRAL INFECTION IN THE PATHOGENESIS OF IC/BPS −A STUDY OF URINARY VIRUS IN PATIENTS WITH IC/BPS AND THEIR CLINICAL CORRELATIONS**
Jhang J, Lori B, Jiang Y, Hsu Y, Ho H, Kuo H

13:52 **612 CONTEMPORARY OUTCOMES OF SURGERY FOR BLADDER PAIN SYNDROME/INTERSTITIAL CYSTITIS**
Downey A P, Osman N I, Park J J, Mangera A, Inman R I, Reid S V R, Chapple C R

14:00 **613 COMPARISON OF CLINICAL CHARACTERISTICS BETWEEN INTERSTITIAL CYSTITIS AND HYPERSENSITIVE BLADDER**
Watanabe D, Akiyama Y, Nomiya A, Niimi A, Aizawa N, Kume H, Igawa Y, Homma Y

14:07 **614 EVALUATION OF THE INCIDENCE AND RISK FACTORS ASSOCIATED WITH VESICOURETERAL REFLUX IN PATIENTS WITH ULCERATIVE BLADDER PAIN SYNDROME/ INTERSTITIAL CYSTITIS**
Oh C Y, Lee S H, Cho S T, Kim Y H, Lee K W, Kim J H, Yoon H, Shin D G, Bae J H

14:15 **615 THE ASSOCIATION OF VULVODYNIA AND UROLOGICAL URGENCY AND FREQUENCY: FINDINGS FROM A COMMUNITY-BASED STUDY**
Harlow B L, Sun Y

14:22 **616 EFFICACY, COMPLICATIONS AND TOLERABILITY OF REPEATED INTRAVESICAL ONABOTULINUMTOXINA INJECTIONS IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME**
Almousa R, Alsowayan Y, Alfadagh A, Almuhrij A

13:30 - 14:30 SESSION 30 (PODIUM SHORT ORAL) - EPIDEMIOLOGY AND PREVENTION

Chairs: Dr Kari A O Tikkinen (Finland), Dr Kathryn L Burgio (United States), Ray Rosen (United States)

13:30 **617 THE ROLE OF VACCINES IN THE PROPHYLAXIS OF RECURRENT UNCOMPLICATED URINARY TRACT INFECTIONS IN ADULT PATIENTS: A SYSTEMATIC REVIEW**
Syed O, Malde S, Sahai A

13:37 **618 INFLUENCE OF REGULAR EXERCISE ON RISK FACTORS OF METABOLIC SYNDROME AND OAB PREVENTION IN WOMEN**
Kim S J, Han J Y, Cho S T, Kim K H, Kim S W, Jung Y J

13:45 **619 URINARY TRACT INFECTION STILL A CHALLENGE TO FIGHT: A REAL SETTING STUDY**
Illiano E, Balsamo R, Li Marzi V, Mancini V, Finazzi Agrò E, De Rienzo G, Natale F, Pastore A, Palleschi G, Balzarro M, Rubilotta E, Costantini E

13:52 **620 INSIGHT INTO BLADDER HEALTH: THE RELATION BETWEEN PREVALENT LOWER URINARY TRACT SYMPTOMS AND INTERFERENCE IN WOMEN IN THE BOSTON AREA COMMUNITY HEALTH SURVEY**
Sutcliffe S, Bavendam T, Cain C, Epperson C N, Fitzgerald C, Gahagan S, Markland A, Shoham D, Smith A, Townsend M, Rudser K, and the PLUS Research Consortium

14:00 **621 THE CURRENT STATE OF CONTINENCE IN CANADA: A POPULATION REPRESENTATIVE EPIDEMIOLOGICAL SURVEY.**
Shaw C, Wagg A, Cahill J J

14:07 **622 WHAT DO WOMEN WANT AND WHY? VALUES BEHIND PREFERRED FORMATS FOR CONTINENCE PROMOTION INTERVENTIONS**
Buttigieg E, Wise M E, Braun E J, Macco M, LeCaire T J, Brown H

14:15 **623 PELVIC FLOOR SYMPTOMS AND SKELETAL FRAGILITY IN POSTMENOPAUSAL WOMEN**
Meyer I, Morgan S, Gibson E, Vadlamudi R, Markland A, Szychowski J, Burroughs L, Richter H E

14:22 **624 THE AGE-DEPENDENT PREVALENCE AND SEVERITY OF URINARY INCONTINENCE AFTER ONE PREGNANCY AND ONE VAGINAL DELIVERY AND THE ATTRIBUTABLE RISK REDUCTION WITH C-SECTION**
Gyhagen M, Åkervall S, Othman J A, Nilsson I, Milsom I

13:30 - 14:30 **SESSION 31 (PODIUM SHORT ORAL) - BASIC SCIENCE: NOVEL BLADDER INSIGHTS**
Chairs: Dr Margot Damaser (United States), Dr Bertha H Chen (United States)

13:30 **625 PRIZE AWARD: BEST IN CATEGORY PRIZE: NOVEL SPATIOTEMPORAL MAPPING ALLOWS NEW INSIGHT INTO THE MODALITY OF MYOGENIC MICROMOTIONS IN THE EX-VIVO TETRODOTOXINISED RABBIT AND PIG BLADDER AND THEIR MODULATION WITH PHARMACOLOGICAL AGENTS.**
King Q, Hulls C, Lentle R, Chambers P, Reynolds G

13:37 **626 DISRUPTION OF NO•-SGC SIGNALLING RESULTS IN BLADDER DYSFUNCTION REVERSIBLE WITH SGC ACTIVATORS**
Zabbarova I, Ikeda Y, Kullmann F A, Birder L A, Straub A, Kanai A J

13:45 **627 BIOFABRICATED AUTOLOGOUS ADIPOSE DERIVED CELL STRUCTURES RECONSTRUCT CRYO-INJURED URETHRA IN RABBITS**
Gautam Silwal S, Imamura T, Shimamura M, Minagawa T, Takashi N, Manabu U, Nakazawa M, Ogawa T, Ishizuka O

13:52 **628 STATE-DEPENDENT PUDENDAL NERVE STIMULATION TO INCREASE BLADDER CAPACITY AND VOIDING EFFICIENCY IN CATS**
Hokanson J, Langdale C, Milliken P, Sridhar A, Grill W

14:00 **629 A NOVEL APPROACH TO MOUSE DETRUSOR MUSCLE PHYSIOLOGY: ACUTE TISSUE SLICE TECHNIQUE AND ITS APPLICATION**
Serdinšek T, Dolenšek J, Stožer A, But I

14:07 **630 TARGETING OXYTOCIN FOR THE TREATMENT OF BLADDER OUTLET OBSTRUCTION DUE TO BENIGN PROSTATIC HYPERPLASIA**
Lee S, Hammar J, Van Gramberg J, Papargiris M, Seidensticker M, Risbridger G P, Whittaker M, Ellem S, Middendorff R, Exintaris B

14:15 **631 USE OF ACCELERATED FATIGUE TESTING AS A SIMPLE IN VITRO TEST FOR ASSESSING MATERIALS FOR THE SURGICAL TREATMENT OF STRESS URINARY INCONTINENCE AND PELVIC ORGAN PROLAPSE**
Roman S, Mangir N, Hympanova L, Deprest J, Chapple C R, MacNeil S

14:22 **632 DECREASE OF ESTROGEN INFLUENCES VESSEL DAMAGE AND INCREASE SKIN TEMPRATURE RECEPTOR CHANNELS WHICH WILL PROVOKE COLD STRESS RELATED FREQUENCY**
Saito T, Imamura T, Nagai T, Minagawa T, Ogawa T, Ishizuka O

13:30 - 14:30 **W31 THE NEED FOR RAISING HEALTH AND INCONTINENCE LITERACY**
Chair: Michael van Balken (Netherlands), Speakers: Donna Bliss (United States), Florine Schlatmann (Netherlands)

14:30 - 14:35 **BREAK TO CHANGE HALLS**

14:35 - 16:05 **SESSION 32 (PODIUM VIDEO) - SURGICAL VIDEO 2**
Chairs: Miss Paraskeve Granitsiotis (United Kingdom), Dr Gary Evan Lemack (United States), Dr Farzeen Firoozi

14:35 **633 THE LATZKO; A HIGH VALUE, VERSATILE VESICOVAGINAL FISTULA REPAIR**
Kieserman-Shmokler C, Sammarco A G, English E M, Swenson C W, DeLancey J O L

14:44 **634 URETHROPLASTY: URETHRAL-CLITORAL ECTOPY**
Shoureshi P, Sajadi K P

14:53 **635 EVALUATION AND TREATMENT OF FEMALE URETHRAL STRICTURE WITH DORSAL ONLAY BUCCAL MUCOSA GRAFT URETHROPLASTY**
Sussman R, Peyronnet B, Armstrong B, Hoffman D, Zhao L, Telegrafi S, Nitti V, Brucker B M

15:02 **636 ROBOTIC ASSISTED LAPAROSCOPIC APICAL SUSPENSION (RALAS): DESCRIPTION OF THE SPIRAL TECHNIQUE**
Hugo D H, Brown K M, Dara P, Bruce L, Goodman L, Gallo T

15:11 **637 FEMALE ARTIFICIAL URINARY SPHINCTER IMPLANTATION: A NON-BLIND LAPAROSCOPIC APPROACH**
López-Fando Lavalle L, Ruiz Hernández M, Gómez de Vicente J M, Lorca Alvaro J, Sánchez Gallego M D, Jiménez-Cidre M A, Burgos Revilla J

15:20 **638 LAPAROSCOPIC TRANSVESICAL EXCISION AND RECONSTRUCTION IN THE MANAGEMENT OF ANTERIOR COLPORRHAPHY MESH EROSION AND STONES AROUND THE BLADDER NECK: VIDEO ABSTRACT**
Tae B S, Jeon B J, Choi H, Park J Y, Yoo E S, Oh M M, Shim J S, Lee J G, Chung H, Bae J H

15:29 **639 LAPAROSCOPIC APPROACH OF ENTEROCELE AND UTERINE PROLAPSE REPAIR USING NATIVE TISSUE**
Keller N, Schmid S, Haemmerle B

15:38 **640 "STANDARDIZED" APICAL FIXATION - LAPAROSCOPIC BILATERAL UTEROSACRAL LIGAMENT REPLACEMENT: DEFINED MATERIAL OF DEFINED SHAPE AT DEFINED FIXATION SITES.**
Ludwig S, Mallmann P

15:47 **641 LAPAROSCOPIC APPROACH FOR VESICOUTERINE FISTULA: STEPPED TECHNIQUE**
Gonzalez M I, Garcia Marchiñena P, Romeo A, Favre G A, Jaunarena J H, Zubieta M E, Tejerizo J C

15:56 **642 STARTOPEE: DEVELOPING TECHNOLOGICAL TOOL FOR PEOPLE WHO LIVE AND LIVE WITH INCONTINENCE**
Calado Junior M C, Piccini A, Gonzaga F, Botelho S

14:35 - 16:05 W32 ICS CORE CURRICULUM (FREE): URODYNAMIC STUDY AND ITS ROLE IN TREATMENT OF NEUROGENIC BLADDER IN CHILDREN

Chair: Jian Guo Wen (China), Speakers: Giovanni Mosiello (Italy), Stuart Bauer (United States), israel franco (United States)

14:35 - 16:05 SESSION 33 (PODIUM SHORT ORAL) - OVERACTIVE BLADDER 2

Chairs: Miss Angie Rantell (United Kingdom), Dr Roger Roman Dmochowski (United States), Dr Victor William Nitti (United States)

14:35 **643 DO ABNORMAL TOILETING BEHAVIORS CONTRIBUTE TO WORSE URINARY SYMPTOMS IN WOMEN?**
Kowalik C G, Daily A, Delpe S, Kaufman M R, Dmochowski R, Reynolds W S

14:42 **644 TRENDS IN THE UTILIZATION OF THIRD LINE TREATMENT MODALITIES FOR OVERACTIVE BLADDER**
Drangsholt S, Slawin J, Brucker B M

14:50 **645 THE EFFECTIVENESS OF NURSE-DELIVERED BOTULINUM TOXIN-A INJECTIONS WITH FLEXIBLE CYSTOSCOPY UNDER LOCAL ANAESTHETIC TO TREAT FEMALE IDIOPATHIC OVERACTIVE BLADDER.**
Smith G, Bolderson J, Lane S, Trochez R

14:57 **646 A SINGLE PROCEDURE OF SELECTIVE BLADDER DENERVATION (SBD) OF THE TRIGONE IN PATIENTS WITH OVERACTIVE BLADDER (OAB) APPEARS TO RESULT IN SYMPTOM IMPROVEMENT FOR 12 MONTHS**
Rovner E, Tu L, De Wachter S G, Versi E, Dmochowski R

15:05 **647 UNDERSTANDING THE RELATIONSHIP BETWEEN ANTERIOR VAGINAL COMPARTMENT PROLAPSE AND OVERACTIVE BLADDER**
Diez-Itza I, Martín-Martínez A, Uranga S, Avila M, Lekuona A, García-Hernández J A

15:12 **648 EFFICACY OF TADALAFIL MONOTHERAPY AND ASSOCIATIONS BETWEEN CHANGES IN SUBJECTIVE OVERACTIVE BLADDER SYMPTOMS AND CHANGES IN OXIDATIVE STRESS IN PATIENTS WITH LOWER URINARY TRACT SYMPTOMS**
Matsuo T, Miyata Y, Araki K, Nakamura Y, Sagara Y, Ohba K, Sakai H

15:20 **649 EARLY AND CONSISTENT IMPROVEMENTS IN URINARY SYMPTOMS AND QUALITY OF LIFE IN IDIOPATHIC OVERACTIVE BLADDER PATIENTS FOLLOWING REPEAT TREATMENT WITH ONABOTULINUMTOXINA: RESULTS OF A MULTICENTER, RANDOMIZED, PLACEBO-CONTROLLED, PHASE 4 TRIAL**
McCammon K, Gousse A, Gruenenfelder J, Hale D, Orejudos A, Patel A, Kohan A

15:27 **650 IS THE ICE WATER TEST ASSOCIATED WITH ANTICHOLINERGIC RESISTANCE IN PATIENTS WITH IDIOPATHIC OVERACTIVE BLADDER?**
Waterschoot M, Uvin P, Everaerts W, Raskin Y, Voets T, Van Oudenhove L, Van der Aa F, van den Heijkant M

15:35 **651 DO OVERACTIVE BLADDER SYMPTOMS EXHIBIT A GAUSSIAN DISTRIBUTION? IMPLICATIONS FOR REPORTING OF CLINICAL TRIAL DATA**
Amiri M, Murgas S, Michel M C

15:42 **652 PATIENTS HAVE POOR COMPLIANCE WITH REPEAT ONABOTULINUMTOXINA INJECTIONS FOR OVERACTIVE BLADDER**
Nguyen A, Tam J, Du C, Wang Q, Hung M, Kim J

15:50 **653 OAB SYMPTOMS: MOMENTARY DIGITAL ASSESSMENT, A SOLUTION TO UNMET CLINICAL NEEDS, USING A REAL LIFE SYMPTOM EVALUATION.**
Herrewegh A, Vrijens D, Kruimel J, Leue C, van Koeveringe G

15:57 **654 EVIDENCE-BASED MANAGEMENT OF OVERACTIVE BLADDER PATIENTS: EXPECTATION TO BECOME SYMPTOM-FREE**
Michel M C, Murgas S, Oelke M, Schneider T

14:35 - 16:05 SESSION 34 (PODIUM SHORT ORAL) - BOWEL DYSFUNCTION AND SEXUAL FUNCTION

Chairs: Dr Alayne Markland (United States), Dr Massarat Zutshi (United States), Uduak Andy

14:35 **655 PRIZE AWARD: BEST IN CATEGORY PRIZE: IS A RESTRICTIVE USE OF EPISIOTOMY FOR INSTRUMENTAL DELIVERY ASSOCIATED WITH AN INCREASE OF OBSTETRIC ANAL SPHINCTER INJURIES?**
Gachon B, Fradet C, Pierre F, Fritel X

14:42 **656 CLINICAL EVALUATION OF A VAGINAL BOWEL CONTROL SYSTEM FOR THE TREATMENT OF FECAL INCONTINENCE**
Richter H E, Dunivan G C, Brown H, Andy U, Dyer K, Rardin C, Muir T, McNevin S, Paquette I, Gutman R, Quiroz L, Wu J

14:50 **657 THE IMPACT OF ACCIDENTAL BOWEL LEAKAGE ON PHYSICAL PERFORMANCE AMONG OLDER ADULTS**
Parker-Autry C Y, Leng I, Matthews C A, Thorne N, Kritchevsky S

14:57 **658 CHARACTERIZATION OF SYMPTOM SEVERITY AND IMPACT OF FOUR FECAL INCONTINENCE PHENOTYPES IN WOMEN PRESENTING FOR EVALUATION AND TREATMENT**
Hoke T P, Meyer I, Blanchard C, Szychowski J, Richter H E

15:05 **659 SDF-1 PLASMID TO REGENERATE THE ANAL SPHINCTER: ARE WE CLOSER TO TRANSLATION?**
Sun L, Damaser M S, Penn M, Reitsch A, Zutshi M

15:12 **660 BIOFEEDBACK PLUS TRANSANAL ELECTRICAL STIMULATION IN WOMEN WITH PELVIC FLOOR DYSSYNERGIA**
Turner-Llaguno A L, Rodríguez-Colorado S, Ramírez-Isarraraz C, Gorbea-Chávez V, Granados-Martínez V

15:20 **661 PATIENT CHARACTERISTICS ASSOCIATED WITH A CLINICALLY IMPORTANT TREATMENT RESPONSE IN WOMEN UNDER-GOING NON-SURGICAL THERAPY FOR FECAL INCONTINENCE**
Richter H E, Jelovsek E, Iyer P, Rogers R G, Meyer I, Newman D K, Bradley M, Harm-Ernandes I, Dyer K, Wohlrab K, Mazloomdoost D, Gantz M

15:27 **662 DEVELOPMENT OF THE ICF-INCONTINENCE ASSESSMENT FORM (ICF-IAF) TO IDENTIFY PROBLEMS AND RESOURCES OF PATIENTS WITH URINARY AND / OR FAECAL INCONTINENCE USING THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) OF THE WORLD HEALTH ORGANIZATION: THE FORMAL CONFERENCE FOR THE ADOPTION OF THE 1ST VERSION**
Goedl-Purrer B, Udier E, von der Heide S, Rothe C, de Jong J, Koenig I, Radlinger L, Koehler B

15:35 **663 STIGMA ASSOCIATED WITH PELVIC FLOOR DISORDERS**
Kieserman-Shmokler C, Bell S, Schimpf M, Berger M B

15:42 **664 PREDICTING OBSTETRIC ANAL SPHINCTER INJURIES (OASIS) IN WOMEN WHO UNDERGO VAGINAL BIRTH AFTER CESAREAN SECTION (VBAC)**
Brown O, Pidaparti M, Miller E S, Kenton K, Lewicky-Gaupp C

15:50 **665 SEXUAL FUNCTION IN WOMEN AFTER SPINAL CORD INJURIES (SCI)**
Prattley S, New F, Davies M

15:57 **666 THE INFLUENCE OF COGNITIVE-BEHAVIORAL PSYCHOTHERAPY ON THE SEXUAL FUNCTION AND QUALITY OF LIFE OF WOMEN WITH SEXUAL DYSFUNCTION: PRELIMINARY RESULTS OF THE RANDOMIZED CLINICAL TRIAL USING QUANTITATIVE AND QUALITATIVE METRICS.**
Pitia A P, Tavares J, Teixeira B, Brasil C, Lemos A, Campos R, Nogueira A, Sodré D, Mascarenhas I, Lordelo P

16:05 - 17:00 **CLOSING CEREMONY & AWARDS**

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BEST CLINICAL ABSTRACT

RELATIONSHIP BETWEEN THE URINARY, UROTHELIAL AND VAGINAL MICROBIOME IN OVERACTIVE BLADDER

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HYPOTHESIS / AIMS OF STUDY

The current definition of overactive bladder (OAB) is based on the absence of infection. The bladder has historically been regarded as a sterile environment until researchers tried to identify microorganisms that could have a causative association with OAB in order to question not only the dogma of urinary sterility but also the syndrome's definition. Using 16s rRNA sequencing technology, bacterial DNA and live bacteria have been detected in human urine in the absence of clinical infection and an association between OAB and an altered URM. There have been criticisms of the 16s rRNA urinary studies and contamination of the urine during collection. The once thought unidirectional effect of pathogenic bacteria on the host, is now believed to be a symbiotic interaction influencing both healthy and pathogenic disease. Some Lactobacilli spp, predominant in the vaginal habitat, are thought to be protective against OAB. Overall, the presence of these in the urinary tract suggests partial colonization with vaginal microbiota. However, no study has examined the microbiota migration between the vaginal and urinary tract habitats. Also, this study aims to get samples of the bladder wall without contamination through a cystoscope in an operating room environment through a sheath. Our aim was to assess the relationship between the urinary, urothelial and vaginal microbiomes in patients suffering from OAB.

STUDY DESIGN, MATERIALS AND METHODS

From a tertiary Urogynaecology centre, over a two-year period, we recruited women who suffered from a variety of OAB symptoms and who were undergoing cystoscopy. After informed consent, women completed the 12 item ICIQ-FLUTS questionnaire assessed by recall over the previous one-month period. We collected a bladder biopsy for the analysis of the urothelial microbiome (UTM), a urine sample for the analysis of the URM and a high vaginal swab for the analysis of the vaginal microbiome (VGM). Samples were stored at -80ºC prior to extraction. DNA from the samples were extracted using QiAMP DNA minikit, and they were sent to Research and Testing Labs in Texas for 16S rRNA sequencing. The microbiomes were first assessed individually against the variables urinary incontinence (UI), relative abundance, urotype and vaginal class, and then compared with each other. UI was assessed on question 9a from the ICIQ-FLUTS questionnaire "does urine leak before you get to the toilet?". Patients who scored more than two were labelled as cases, less than two were controls. Patients were also split into two cohorts, high and low abundance, depending on the microbiome. We classified the VGM into Lactobacillus dominant or Diverse (no dominant species) and the URM into three urotypes: Lactobacillus, Diverse and Other. Data were analysed using STAMP statistical software. For variables where patients were split into two cohorts, we used t-test (equal variance) to account for multiple hypothesis testing. For variables where patients were split into more than two cohorts, Tukey-Kramer post-hoc test was performed. Both tests were added a Benjamini-Hochberg FDR correction.

RESULTS

We recruited 103 women with a mean age of 50 years (SD 16.4) and median parity of 2 (range 0-5). All participants had a bladder biopsy, from 99 women we obtained a urine from 68 women a high vaginal specimen. From a total of 964, 405 identified species were defined as "unclassified" at different taxonomic levels and have been assigned a number for inclusion in the statistics. Contaminated samples were excluded from our analyses. Table 1 summarises all the significant bacteria species found in the individual microbiomes.

We successfully sequenced 65 pairs of urine and vaginal samples, 99 pairs of biopsy and urine samples, and 68 pairs of vaginal and biopsy samples. These analyses showed that patients suffering from UI had significantly more Aerococcus christensenii, Microbacterium spp (p=0.042) and Unclassified 313 (p=0.036) in their URM. Figure 1 shows all species in the UTM depending on their relative abundance of URM bacteria. Low abundance VGM patients had increased Parvimonas sps (p=0.027) in their URM and patients with a low abundance URM had increased Escherichia coli (p=0.05) in their VGM. Lactobacillus dominant urotypes were associated with Lactobacillus crispatus dominated VGM (p=0.044) and increased amounts of Actinomyces spp (p=2.74e-3) in the UTM. Other urotypes had increased Prevotella bivia (p=7.51e-3) and Bacteroides vulgatus (p=0.04) in the VGM and increased Burkholderia pseudomallei (p=8.6e-3) in the UTM. Lactobacillus spp dominant VGM had significantly more Prevotella bivia (p=0.032) and Acinetobacter iwoffii (p=0.047) in their URM. Lactobacillus spp dominant VGM had increased Lactobacillus crispatus (p=2.42e-3) in their UTM, diverse VGM patients had significantly more Anaerococcus spp (p=0.023) in their UTM.

INTERPRETATION OF RESULTS

To our knowledge, our study is the first to examine the microbiome from urothelial biopsy samples. UTM analyses allows identification of bacteria that a simple microscopic culture does not detect. Hence, we confirmed that Prevotella spp plays a protective role for UI and uncovered Propionmicrobium lymphophilum as a possible contributor to the development of OAB. The latter's presence indicates that these patients may have previously suffered from clinical infection and that the immune system was unable to completely remove the bacteria. We also found that there is a link between the three microbiomes, with regards to Lactobacillus spp in general and Lactobacillus crispatus in particular, and that

some vaginal species predict the urine composition depending on abundance and diversity. Our results also confirmed that uropathogenic organisms, such as Aerococcus christenseni arise from the VGM.

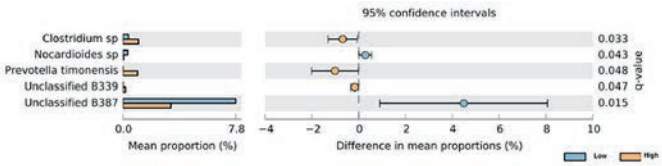
CONCLUDING MESSAGE

We confirmed that there is a relationship between the urogenital microbiomes with differences between healthy patients and those suffering from OAB. Urothelial sampling could become a useful component in the workup of these microbiomes. Some species play both protective and pathogenic roles depending on their environment. In OAB patients, numerous species with the urinary tract microbiome are associated with urinary incontinence. Further research is needed to improve microbiota classification and to investigate the relationship between the urogenital microbiomes and various lower urinary tract symptoms to fully understand the pathophysiology of OAB.

FIGURE 1

Microbiome	Number samples	Species associated with Urinary incontinence	Case/Control	p-value	Abundant species	p-value	Microbiome Abundance
Urothelium (UTM)	103	Prevotella bivia	Control	0.028	Lactobacillus iners	3.42e^-3	High
		Unclassified 55 (Class: Alphaproteobacteria)	Control	0.025	Unclassified 155 (Family Bukholderiaceae)	-	High
		Propionibacterium lymphophilum	Case	0.034	-	-	-
		-	-	-	Unclassified 382 (Genus: Sphingobium)	0.019	Low
Urine (URM)	99	-	-	-	Lactobacillus spp	4.32e^-3	High
		Acidocella spp	Control	0.042	Actinobacter spp	8.99e^-4	Low
		Unclassified 74 (Order: Bacillales)	Control	0.031	Unclassified 353 (Genus Propionibacterium)	8.42e^-4	Low
		Unclassified 313 (Genus: Methylobacterium)	Case	0.036	-	-	-
Vagina (VGM)	68	n/a	n/a	n/a	Clostridium spp	0.043	Low
		n/a	-	-	Unclassified 354 (Genus: Propionibacterium)	0.026	Low

FIGURE 2



REFERENCES

1. Frontiers in cellular and infection microbiology 2013;341
2. Journal of clinical microbiology 2014;52(3): 871-876
3. Nature reviews Urology 2015;12(2): 81-90.

Funding None **Clinical Trial** Yes **Registration Number** 13/LO/1313 **RCT** No **Subjects** Human **Ethics Committee** Nottingham REC Centre **Helsinki** Yes **Informed Consent** Yes

2 www.ics.org/2018/abstract/2

PREDICTING RISK OF POST-OPERATIVE URINARY RETENTION IN WOMEN UNDERGOING PELVIC RECONSTRUCTIVE SURGERY

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HYPOTHESIS / AIMS OF STUDY

Following surgery for pelvic organ prolapse (POP) or stress urinary incontinence (SUI), 2.5-43% of women have post-operative urinary retention (PUR). Known risk factors for PUR include age >50, lower BMI, advanced POP, baseline voiding dysfunction, previous incontinence surgery, spinal anesthesia, intra-operative fluid administration >750 mL, estimated blood loss >100 mL, post-operative opioid use, and post-operative UTI (1). The objective of this analysis was to build a statistical model to produce individualized risk predictions of post-operative urinary retention (PUR) for women undergoing pelvic floor reconstructive surgery.

STUDY DESIGN, MATERIALS AND METHODS

Institutional Research Ethics Board approval was obtained. A retrospective chart review of all women who underwent pelvic reconstructive surgery for SUI or POP by a single urogynecologist at a tertiary referral centre between 2011-2014 inclusive was performed. Seven surgical procedures were included: vaginal hysterectomy, anterior vaginal repair, posterior repair, laparoscopic assisted vaginal hysterectomy, laparoscopic sacrocolpopexy, midurethral sling (trans-obturator) and laparoscopic sling. Patients who failed 2 trials of void on post-operative day 1 (post void volume >150cc with voided volume >200cc) or any patient who required re-catheterization in the first two days after surgery were defined as having PUR. Potential risk factors studied for PUR risk included age, menopause status, body mass index, number of medical co-morbidities, grade of prolapse (vault, anterior or posterior), pre-operative voiding dysfunction, previous SUI/POP procedures, type of surgery (see above), duration of surgery and estimated blood loss >300cc.

In univariate analysis, the frequency of pre-operative and intra-operative potential risk factors for PUR were compared using Student's t-test or Chi-square test in these 2 groups with $P < 0.05$ considered statistically significant.

Logistic regression methodology was then used to develop a nomogram to model the probability of PUR. The first set of covariates considered were those hypothesized to be clinically relevant: age, all 7 types of surgery, pre-op history of voiding dysfunction, diabetes, hypertension, number of other comorbidities. These predictors were treated as the baseline model, and the remaining predictors were explored to determine if they add additional predictive value. The following process was used to obtain the final prediction model: 1) Imputation: Missing values in the dataset were im-

puted using Multiple Imputed Chained-Equations (MICE) in order to avoid removing entire cases who only have a few missing measures. This allowed the full collection of patients (N=334) to be used in analysis (mice package in R was used). 2)Best-subsets model selection: Because of the relatively small number of observations to the number of possible variables to use in the dataset, it was of interest to use a model selection procedure to obtain a subset of the predictors that explain the response the best. This protects the final model from overfitting the observed data, which would have accuracy issues when trying to generalize to future patients. Best-subsets variable selection looks at every possible combination of predictor variables and chooses the subset that fits the best according to the criteria defined by Hastie (3) . In order to reduce bias, the modeling process was bootstrapped to assess the variability it has from sample to sample.

RESULTS

334 women underwent SUI/POP procedures. The incidence of PUR was 30.8% (103/334). On univariate analysis, comparing the PUR and non-retention groups, there was no statistical difference in mean age, menopause status, mean body mass index, pre-operative voiding dysfunction, high-grade vault or posterior prolapse, duration of surgery and estimated blood loss >300cc. The PUR group was significantly more likely have a higher grade anterior prolapse [67.0% vs. 52.4%, P =0.004], anterior vaginal repair [76.7% vs 54.8%, P=0.00005], and laparoscopic sling [17.5% vs. 6.9%, P=0.003]. The non-retention group was significantly more likely to have fewer medical co-morbidities [24.7% vs. 14.6%, P =0.02], had previous SUI/POP procedures [27.3% vs. 12.6%, P =0.003], and undergo the following procedures: midurethral sling (trans-obturator) [49.8% vs 37.9%, P=0.04] and laparoscopic sacrocolpopexy [25.0% vs 8.74%, P=0.00006].

A total of 10 predictive variables were considered for the nomogram: all 7 surgical procedures, diabetes, hypertension, medical co-morbidities. Of these, 6 were included to the final model after sequential analysis of each variable's predictive function: diabetes, medical co-morbidities, laparoscopic sling, anterior vaginal repair, laparoscopic sacrocolpopexy, and vaginal hysterectomy (Figure 1).

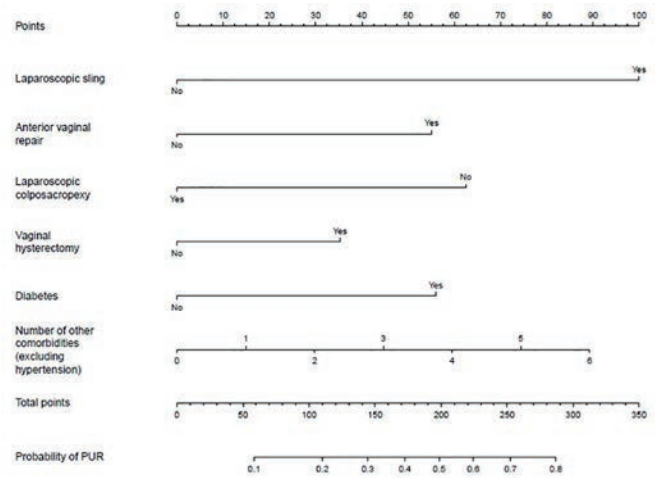
INTERPRETATION OF RESULTS

This nomogram provides a practical way to obtain individualized predictions of the risk of PUR, with each variable accorded its own number of points (as per the top line). After adding up the points acquired from each variable, drawing a vertical line from the "Total points" line to the "Probability of PUR" then provides the estimated risk for an individual patient.

CONCLUDING MESSAGE

This is the first nomogram specifically developed to predict the risk of PUR in women undergoing pelvic reconstructive surgery. The nomogram is easy to use and provides a visual tool when counselling patients pre-operatively regarding their individual risk of PUR.

FIGURE 1



REFERENCES

1. Geller EJ. Prevention and management of postoperative urinary retention after urogynecologic surgery. Int J Womens Health 2014;28:829–38.
2. Niël-Weise BS, van den Broek PJ. Urinary catheter policies for short-term bladder drainage in adults. Cochrane Database of Systematic Reviews 2005, Issue 3. Art. No.: CD004203.
3. Hastie T, Tibshirani R, Friedman J. Elements of Statistical Learning, 2009, 2nd ed Springer Verlag.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Sunnybrook Health Sciences Centre Research Ethics Board **Helsinki** Yes **Informed Consent** Yes

3 www.ics.org/2018/abstract/3

CONSERVATIVE MANAGEMENT AWARD (JOINT)
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A RANDOMIZED TRIAL COMPARING COMBINED MIDURETHRAL SLING AND BEHAVIORAL/PELVIC FLOOR THERAPY TO MIDURETHRAL SLING ALONE FOR MIXED URINARY INCONTINENCE – THE ESTEEM TRIAL

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1. For the NICHD Pelvic Floor Disorders Network

HYPOTHESIS / AIMS OF STUDY

To assess whether combined midurethral sling (MUS) + perioperative behavioral/pelvic floor therapy (BPTx) is superior to MUS alone for improving mixed urinary incontinence (MUI) symptoms in women electing surgery.

STUDY DESIGN, MATERIALS AND METHODS

We conducted a randomized, multi-center trial of MUS+BPTx vs. MUS alone for treatment of MUI. MUI was defined as at least moderately bothersome stress (SUI) and urgency (UUI) incontinence symptoms (based on the Urogenital Distress Inventory (UDI)), objective SUI, and ≥1 episode of both SUI and UUI on a 3-day bladder diary. Participants underwent retropubic or transobturator MUS. Randomization to BPTx was 1:1 and stratified by site and UUI severity. The BPTx intervention, conducted by trained interventionists, included a standardized intervention with education on voiding habits, pelvic floor muscle training, bladder training, strategies to control urgency and reduce/prevent urinary symptoms starting 1 month prior to and lasting 6 months after the MUS surgery.

The primary outcome was change in MUI symptoms 12 months post MUS based on the total UDI score, analyzed by intention to treat (ITT). Secondary outcomes included SUI and UUI symptoms based on UDI stress and irritative subscale scores, 3-day bladder diary, Patient Global Impression of Improvement and Severity (PGI-I, PGI-S), and the Incontinence Impact Questionnaire (IIQ). General linear mixed modeling, adjusting for site, visit, baseline UUI severity, and additional UI treatment post MUS, was used to compare efficacy of MUS+BPTx and MUS alone. The trial was powered to detect published minimum important differences between groups for the total UDI score, UDI-irritative, and UDI-stress subscale scores, yielding a sample size of 200 women per group. 472 were randomized to allow a 15% dropout.

RESULTS

464 participants were included in the primary analysis (235 MUS+BPTx, 229 MUS). Mean age was 54 (+/- 11) years, 78% were White, 9% Black/African American, and 23% Latina. Mean BMI was 32 (+/- 7). The MUS+BPTx group had a greater improvement in severity of total-UDI scores compared to the MUS alone group (-129 vs. -115 points, P=0.03). The UDI-irritative and UDI-stress subscale scores significantly improved, with the MUS+BPTx showing greater improvement (see Table). The MUS+BPTx group also had greater improvements in diary parameters, normalization of voiding frequency and IIQ scores compared to MUS alone (see Table). There was no difference in PGI-I or PGI-S scores between groups. At 12 months, MUS+BPTx decreased the risk of requesting any additional SUI or UUI treatment compared to MUS alone (aOR: 0.44 (0.24, 0.81)).

INTERPRETATION OF RESULTS

The MUS is associated with improvements in MUI symptoms at 12 months. The addition of BPTx improves UDI scores, the number of total and UUI episodes, urinary frequency, pad use and quality of life compared to MUS alone.

CONCLUDING MESSAGE

Although MUS improves MUI symptoms, combined MUS+BPTx is associated with greater improvements in urinary symptoms and quality of life compared to MUS alone.

FIGURE 1

Table. ESTEEM Trial - Changes from baseline to 12 months postoperative, ITT modeling analyses*

Outcome	Mean change from baseline (95% CI)		Mean Difference (95% CI)	P-value
	MUS only	MUS + BPTx		
UDI-total	-115 (-133, -96)	-129 (-147, -110)	-14 (-26, -2)	0.027
UDI-irritative	-39 (-47, -30)	-45 (-54, -37)	-6 (-12, -0.4)	0.037
UDI-stress	-62 (-71, -53)	-68 (-77, -59)	-6 (-12, 0.2)	0.060
UUI episodes per day	-0.4 (-1.2, 0.4)	-1.1 (-1.8, -0.3)	-0.7 (-1.2, -0.1)	0.015
Total incontinence episodes per day	-1.4 (-2.5, -0.3)	-2.4 (-3.5, -1.3)	-1.0 (-1.7, -0.3)	0.009
Wet pads per day	-0.7 (-1.6, 0.2)	-1.5 (-2.4, -0.6)	-0.8 (-1.4, -0.2)	0.008
Daytime voids per day	-1.3 (-2.1, -0.5)	-2.2 (-3.1, -1.4)	-0.9 (-1.5, -0.4)	<.001
Incontinence Impact Questionnaire score	-102 (-136, -68)	-132 (-166, -98)	-30 (-52, -8)	0.008
	n/N (%)		Adjusted OR (95% CI)	P-value
Normalization of voiding frequency	48/105 (46)	80/109 (73)	4.6 (2.1, 10.0)	<0.001
Request for SUI or UUI retreatment**	36/229 (16)	19/235 (8)	0.44 (0.2, 0.8)	0.008

*Model adjusts for site, visit, baseline UUI severity, and post-MUS additional UI treatment.
**Model adjusts for site, and baseline UUI severity.

Funding 2 UG1 HD069013; 2 UG1 HD041261-16; 2 UG1 HD054214; U10 HD054215; 2 UG1 HD041267-17; U10 HD069025; 2 UG1 HD069010-06; 2 UG1 HD069006-06; 2 U24 HD069031 **Clinical Trial** Yes **Registration Number** NCT01959347 **RCT** Yes **Subjects** Human **Ethics Committee** Women and Infants Hospital Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

4 www.ics.org/2018/abstract/4

URODYNAMIC AND IMAGING FINDINGS IN MYELOMENINGOCELE INFANTS PREDICT NEED FOR FUTURE BLADDER AUGMENTATION

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HYPOTHESIS / AIMS OF STUDY

Proactively managed myelmomeningocele patients undergo urodynamic testing, renal ultrasound, and voiding cystometrogram during infancy to assess for elevated bladder pressures, vesicoureteral reflux, and/or hydronephrosis. Although these results often impact clinical decision making, the significance of those findings remains undefined. We hypothesized that infants born with elevated bladder pressures, vesicoureteral reflux, and/or hydronephrosis have persistent risk of upper tract damage despite early initiation of clean intermittent catheterization and pharmacotherapy, thus carry higher odds of requiring augmentation cystoplasty in the future.

STUDY DESIGN, MATERIALS AND METHODS

We retrospectively identified all patients with myelomeningocele followed since infancy at a single institution from 1984 to 2017. Infancy was defined as younger than 1 year of age. All patients underwent cystometrogram, voiding cystourethrogram, and renal ultrasound during infancy. Pa-

tients with persistently elevated bladder pressures despite clean intermittent catheterization and pharmacotherapy underwent augmentation cystoplasty to prevent upper tract damage. Socially unacceptable urinary incontinence significantly bothersome to the patient was also an indication for augmentation cystoplasty. Patients without at least 8 years of follow-up were excluded from our study.

The primary outcomes were augmentation cystoplasty, augmentation cystoplasty due to persistently elevated bladder pressures, and augmentation cystoplasty for urinary incontinence. Chi-square analysis was performed to assess whether presence of detrusor leak point pressure or end fill pressure (DLPP/EFP) above 40 cm H2O, vesicoureteral reflux, or hydronephrosis during infancy were more likely to undergo augmentation cystoplasty, augmentation cystoplasty due to persistently elevated bladder pressures, or augmentation cystoplasty for urinary incontinence. If univariate analysis was significant for the given dependent variable, a binary logistic regression was run with DLPP/EFP above 40 cm H2O, vesicoureteral reflux, and hydronephrosis during infancy as the independent variables.

RESULTS

The study included 111 patients with a mean follow up time of 17.0 years (SD 6.6 years). Augmentation cystoplasty was performed in 27 patients (24.3%). The primary indication for augmentation cystoplasty was worsening bladder pressures in 17 (63.0%) patients while 10 (37.0%) underwent surgical intervention to achieve urinary continence. Patients with DLPP/EFP above 40 cm H2O and vesicoureteral reflux during infancy were more likely to undergo augmentation cystoplasty for elevated bladder pressures ($p = 0.04$, $p = 0.05$, respectively). Patients with hydronephrosis during infancy were not more likely to undergo augmentation cystoplasty for elevated bladder pressures ($p = 0.97$).

Binary logistic regression revealed that patients with infancy DLPP/EFP above 40 cm H2O ($p = 0.02$, OR 3.75, 95% CI 1.20 – 11.72) and vesicoureteral reflux ($p = 0.03$, OR 3.48, 95% CI 1.11 – 10.92) are predictive of future augmentation for high pressure bladder, while infant hydronephrosis ($p=0.53$, OR 0.62, 95% CI 0.14 – 2.74) is not. Alternatively, myelomeningocele infants with DLPP/EFP above 40 cm H2O, vesicoureteral reflux, or hydronephrosis were not more likely to undergo augmentation cystoplasty for urinary incontinence ($p = 0.40$, $p = 0.55$, $p = 0.12$) or augmentation cystoplasty in general ($p = 0.24$, $p = 0.23$, $p = 0.28$, respectively) compared to their counterparts.

INTERPRETATION OF RESULTS

Our findings demonstrate that myelomeningocele infants with elevated DLPP/EFP or vesicoureteral reflux are at higher risk of later augmentation for the indication of persistently elevated bladder pressures. Nonetheless, it should be noted that the majority of patients with DLPP/EFP greater than 40 cm H2O and presence of vesicoureteral reflux during infancy did not undergo augmentation cystoplasty, regardless of indication. Thus, patients requiring augmentation remain in the minority despite the presence of risk factors. Pediatric urologists can counsel parents and guardians that the majority of myelomeningocele patients respond to clean intermittent catheterization and pharmacotherapy until adulthood, regardless of infant testing results.

Augmentation cystoplasty rates for proactively managed myelomeningocele patients may be higher than previously reported when including urinary incontinence as an indication for surgical intervention. Kaefer et al and Wu et al (references) have reported augmentation rates of 10.9 and 16.7%, respectively, but the average age of follow-up in those studies were 8.6 and 11.9 years, respectively, and urinary incontinence was not included as an indication for surgical intervention. Long-term, longitudinal follow-up of our myelomeningocele population allowed us to capture a realistic rate of augmentation until adulthood. Our findings highlight the fact that there will be parents and patients who will undergo augmentation with the primary goal of improving quality of life and gaining independence. This is a pertinent finding in the setting of growing emphasis on improving quality of life and independence in the aging myelmomeningocele population.

CONCLUDING MESSAGE

Ultimately, these findings will help pediatric urologists counsel parents and guardians during infancy and beyond. If infant test results reveal elevated pressures and vesicoureteral reflux, it would be appropriate to counsel parents and guardians on the importance of adherence to proactive management strategies given the higher risk for future augmentation cystoplasty due to persistently elevated bladder pressures. It should be expected that despite proactive management, a select group of patients will require surgical intervention to prevent upper tract damage. In addition, with a growing emphasis on improving quality of life and independence among patients with myelomeningocele, surgical intervention should remain an option with the goal of achieving urinary continence. Evaluating the value and significance of urodynamic testing and imaging studies during infancy may be more accurately and objectively studied with rigorously designed standardized clinical pathways that include long-term outcomes, but until then, our findings provide useful information for pediatric urologists providing care for myelomeningocele children.

FIGURE 1

Table 1. Demographics of myelomeningocele cohort (n=111)

Variable	n (%)
Sex	
Male	58 (52.3)
Female	53 (47.7)
Level of Lesion	
Thoracic	11 (9.0)
Lumbar	60 (54.1)
Lumbosacral	27 (24.3)
Sacral	13 (11.7)
DLPP > 40 cm H_2O during infancy	35 (31.5)
AC	11 (31.4)
AC for Elevated Pressure	9 (25.7)
AC for Incontinence	2 (5.7)
Hydronephrosis before 1 year	20 (18.0)
AC	3 (15.0)
AC for Elevated Pressure	0 (0.0)
AC for Incontinence	3 (15.0)
Presence of VUR before 1 year	31 (27.9)
AC	10 (32.3)
AC for Elevated Pressure	2 (6.5)
AC for Incontinence	8 (25.8)
CIC recommended	98 (88.3)
Documented CIC noncompliance	26 (26.5)
Oxybutynin use	88 (79.3)

AC: Augmentation Cystoplasty; CIC: Clean intermittent catheterization; DLPP: detrusor leak point pressure; VUR: vesicoureteral reflux

FIGURE 2

Table 2. Predictors of augmentation cystoplasty for elevated bladder pressure (n = 111)

	Augmentation cystoplasty for elevated bladder pressures (n=17)		
Infancy testing	Odds Ratio	95% CI	*p*-value
DLPP/EFP > 40 cm H_2O	**3.74**	**1.20 – 11.72**	**0.02**
Hydronephrosis	0.62	0.14 – 2.74	0.53
VUR	**3.48**	**1.11 – 10.92**	**0.03**

Binary logistic regression. DLPP: Detrusor Leak Point Pressure; EFP: End Fill Pressure; VUR: Vesicoureteral reflux.

REFERENCES

1. Kaefer M, Pabby A, Kelly M, Darbey M, Bauer SB. Improved bladder function after prophylactic treatment of the high risk neurogenic bladder in newborns with myelomentingocele. The Journal of urology. Sep 1999;162(3 Pt 2):1068-1071.
2. Wu HY, Baskin LS, Kogan BA. Neurogenic bladder dysfunction due to myelomeningocele: neonatal versus childhood treatment. The Journal of urology. Jun 1997;157(6):2295-2297.

Funding None **Clinical Trial** No **Subjects** None

5 www.ics.org/2018/abstract/5

THE RELATIONSHIP BETWEEN MRI-DOCUMENTED PUBOVISCERAL MUSCLE TEAR AND URETHRAL CLOSURE PRESSURE IN PRIMIPAROUS WOMEN WITH KNOWN RISK FOR PUBOVISCERAL MUSCLE TEAR DURING THEIR VAGINAL DELIVERY

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HYPOTHESIS / AIMS OF STUDY

Vaginal birth is a risk factor for developing urinary incontinence [1] due to birth-related injuries. Pubovisceral muscle tear is one common birth-related injury that often occurs on the pubovisceral portion of levator ani among postpartum women with high risk factors for the tear during birth [2]. Continence relies on optimization of urethral closure pressure across women's activities. Pelvic muscle contraction to preempt leakage (e.g. during cough) has been shown to be effective [3]. However, little is known about the degree to which pubovisceral muscle tear affects potential for urethral closure pressure with a volitional pelvic muscle contraction. To investigate the effect of pubovisceral muscle tear on ability to increase urethral closure pressure by a volitional pelvic muscle contraction among women within the first year post vaginal birth who have known risk factors for pubovisceral muscle tear during that birth (e.g. forceps, long 2nd stage, and older age).

STUDY DESIGN, MATERIALS AND METHODS

Fifty-six primiparas were evaluated at about 8 months postpartum in this secondary data analysis study. Urethral closure pressures were measured by urethral pressure profile both at rest, which is called resting urethral closure pressure and during effort to contract the pelvic muscle, which is volitionally contracting urethral closure pressure. Pubovisceral muscle tear was evaluated by magnetic resonance imaging (MRI) and was classified into one of five categories from none to >50% tear for each side. We coded MRI-documented pubovisceral muscle tear status into a dummy variable as 0 (without tear) and 1 (with tear) for two sides for simplicity of presenting the data via multiple linear regression modeling. We tested whether pubovisceral muscle tear predicts contracting urethral closure pressure after adjusting for resting urethral closure pressure.

RESULTS

There was no significant difference in resting urethral closure pressure between no pubovisceral muscle tear and tear groups (Table 1). Women without tear had higher contracting urethral closure pressure compared to those with tear (Table 1). Women with tear could not significantly increase contracting urethral closure pressure. Multiple regression modeling showed that the contracting urethral closure pressure was associated with the pubovisceral muscle tear ($p = .001$), after adjusting for resting urethral closure pressure (p

< .001), with unstandardized coefficient 21 centimeters of water for pubovisceral muscle tear and coefficient of determination R square = .42 (Table 2).

INTERPRETATION OF RESULTS

A MRI-documented pubovisceral muscle tear decreases mean contracting urethral closure pressure by on average 21 centimeters of water pressure, when controlling for the resting urethral closure pressure constant. R square = .42 from the regression model indicated that 42% of the variation in the contracting urethral closure pressure was explained by pubovisceral muscle tear and resting urethral closure pressure. With pubovisceral muscle tear, women on average have reduced ability to increase contracting urethral closure pressure at a moment of anticipated increased bladder pressure, as with sneeze or cough.

CONCLUDING MESSAGE

Within the first year of vaginal birth, women with pubovisceral muscle tear are significantly less able to increase urethral closure pressure by using a volitional pelvic muscle contraction. Since lifetime continence requires adequate urethral closure pressure, pubovisceral muscle tear may explain the reduced ability to compensate for known age-related loss of urethral closure pressure over time.

FIGURE 1

Table 1. Differences in urethral closure pressures by group and by urethral pressure activity

Urethral closure pressure (cm H_2O)	No pubovisceral muscle tear, N = 35 Mean (SD)	Any pubovisceral muscle tear, N = 21 Mean (SD)	*p*-value
Resting urethral closure pressure	67.9 (22.5)	68.2 (19.0)	.958*
Contracting urethral closure pressure	86.8 (27.4)	65.9 (21.3)	.004*
p-value	< .001**	.602***	

Note. Two forms of urethral closure pressure (at rest and at contraction) are represented within two groups of women at eight months postpartum. One group had no pubovisceral muscle tear on MRI and the other group all had pubovisceral muscle tear on MRI. SD = standard deviation. Significant at the $p<.05$ level, two-tailed. * Independent Student's t test. ** Wilcoxon signed rank test. *** Paired t test.

FIGURE 2

Table 2. Multiple linear regression predicting postpartum contracting urethral closure pressure among postpartum women at eight month, each with history of at least one risk factor for pubovisceral muscle tear during her vaginal birth

	Contracting urethral closure pressure (cm H_2O) (N=56)		
Variables	Unstandardized coefficients (B)	Std. error of B	p-value
MRI-documented pubovisceral muscle tear (yes coded 1 or no coded 0)	-21.1	5.8	.001
Resting urethral closure pressure (per each 10 cm H_2O)	6.7	1.4	< .001

Note. Significant at the $p<.05$ level. $R^2 = .42$.

REFERENCES

1. Buckley BS, Lapitan MCM. Prevalence of urinary incontinence in men, women, and children—current evidence: Findings of the Fourth International Consultation on Incontinence. Urol, 2010; 76:265-270.
2. Miller JM, Low LK, Zielinski R, et al. Evaluating maternal recovery from labor and delivery: Bone and levator ani injuries. AJOG, 2015; 213:188.e1-188.e11.
3. Miller JM, Ashton-Miller JA, DeLancey JOL. A pelvic muscle precontraction can reduce cough-related urine loss in selected women with mild SUI. J Am Geriatr Soc, 1998; 46: 870-874.

Funding NIH R21 HD049818, NIH NICHD/ORWH P50 HD044406 002 **Clinical Trial** No **Subjects** Human **Ethics Committee** Institutional Review Board of the University of Michigan Medical School **Helsinki** Yes **Informed Consent** Yes

6 www.ics.org/2018/abstract/6

ASSOCIATION BETWEEN CUMULATIVE ANTICHOLINERGIC BURDEN AND THE OCCURRENCE OF FALLS AND FRACTURES AMONG PATIENTS WITH OVERACTIVE BLADDER: A RETROSPECTIVE OBSERVATIONAL STUDY

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HYPOTHESIS / AIMS OF STUDY

Overactive bladder (OAB) and its symptoms are associated with an increased risk of experiencing falls and/or fractures, particularly among older adults (≥65 years of age). Exposure to anticholinergic medications, referred to as anticholinergic burden, has also been shown to increase the risk of falls and fractures among patients with other conditions (including, for example, neurologic impairments and cardiovascular disease), but its impact in an OAB population has not previously been studied. This study aimed to estimate the association between time varying anticholinergic burden and the risk of subsequent falls and fractures in individuals with OAB.

STUDY DESIGN, MATERIALS AND METHODS

A retrospective cohort study was performed using the Truven MarketScan United States claims databases. Adults aged ≥18 years were included if they were identified as having OAB based on the presence of International Classification of Diseases (9th Edition) (ICD-9) codes specific for OAB, or having claims for OAB-specific medications, between January 2007 and December 2015; and if they had a minimum of 12 months of medical and pharmaceutical coverage in the year prior to index date. Both newly-diagnosed (defined as the absence of ICD codes or dispensations related to OAB in the 12 months prior to the first identified OAB-related code or dispensation) and prevalent cases of OAB were included in the study cohort. A 15% sample of the cohort was randomly selected for computational feasibility (i.e. 'OAB cohort'). Within the OAB cohort, the relationship between anticho-

linergic burden and a subsequent fall or fracture that was sufficiently severe to require medical attention was assessed.

Anticholinergic burden was assessed serially and longitudinally using a novel total cumulative burden measure that estimates anticholinergic exposure over a predefined time period and considers anticholinergic load of medications based on the Anticholinergic Cognitive Burden scale. Cumulative anticholinergic exposure was calculated over the 12 months prior to index date (i.e. baseline) and updated at six-month intervals over the study period; at each interval, anticholinergic exposure was calculated over the 12 months prior. Scores were categorized according to no burden (score of zero), low burden (1 to 89), medium burden (90 to 499), and high burden (500+).

A composite outcome of a fall or fracture was defined using a validated list of ICD-9 and Healthcare Common Procedure Coding System/Current Procedural Terminology codes.(1) The relationship between the time to the first fall or fracture and time-varying anticholinergic burden was assessed using the Andersen-Gill counting style formulation of an extended Cox proportional hazards model, adjusting for age, sex, and the presence of baseline comorbidities associated with high anticholinergic burden. Sensitivity analyses were conducted applying the Cox model in subgroups of individuals ≥65 years, as well as among those with presence of comorbidities associated with high anticholinergic burden. As a sensitivity analysis, this association was investigated via a marginal structural model (MSM) with sequential inverse-probability weighting to allow for the control of time-varying covariates that may be related to both anticholinergic medication use as well as risk of falls and fractures.

RESULTS

The OAB cohort consisted of 154,432 individuals identified as having OAB during the study period; 33% of those had claims for OAB medications in the year prior to index date (inclusive), the remainder were eligible exclusively based on ICD-9 codes. At baseline, the mean age was 56 years, 67.9% were female, with the majority of OAB cases newly-diagnosed (69.1%). Mean anticholinergic burden at baseline was classified as moderate (266.7, with a standard deviation [SD] of 486.5); more than 60% had either no or low anticholinergic burden, and 19.1% had high burden. Burden was considerably higher among prevalent cases relative to those newly-diagnosed at baseline (522.2 [613.3] vs. 152.6 [363.6]), and among older adults (≥65 years) relative to younger individuals (433.8 [570.3] vs.213.8 [443.9]). Within the OAB cohort, there were 1,178 individuals who experienced falls and 4,603 individuals who experienced fractures in the year before baseline. The rate of falls, fractures, and falls or fractures over the study period was 1.8, 3.3, and 5.0 per 100 patient years, respectively. After adjusting for important confounders, estimates from the Cox model (Table 1) indicated that the risk of experiencing a fall or fracture increased with increasing anticholinergic burden. The increased risk of falls or fractures ranged from 1.23 (1.17-1.30) for low vs. no burden, to 1.38 (1.32-1.44) for high vs no burden. There was also a strong and non-linear association between the occurrence of falls or fractures and increasing age. The impact of increasing anticholinergic burden was present, but less pronounced among older adults. The presence of cardiovascular disease at baseline, as well as endocrine, nutritional, and metabolic disorders, was also associated with a greater probability of experiencing falls or fractures. Results from the MSM showed a similar trend as with the base case Cox model, although the magnitude of the association was lower, as expected, as this type of model is better at controlling for confounding factors.

INTERPRETATION OF RESULTS

Higher levels of anticholinergic burden were associated with a higher risk of experiencing a fall or fracture among individuals with OAB, both overall and among older adults with a higher baseline level of anticholinergic burden.

CONCLUDING MESSAGE

The study findings suggest that individuals with OAB with at least some level of cumulative anticholinergic burden were at higher risk of experiencing falls and fractures. These results were consistent across all conducted analyses and stratifications, including subgroup analyses in highly burdened subpopulations. The results of this study contribute evidence to inform the appropriate use of anticholinergic medications, particularly in older OAB patients with multifaceted comorbidity.

FIGURE 1

Table 1: Results from Cox model estimating the association between falls or fractures and anticholinergic burden, among all age groups and among those ≥65 years, adjusted for important confounders

		All age groups		65 years or older	
		HR	p-value	HR	p-value
By AB level vs. no burden	Low vs. none	1.23 (1.17, 1.30)	<0.001	1.13 (1.04, 1.24)	0.006
	Medium vs. none	1.30 (1.24, 1.36)	<0.001	1.17 (1.09, 1.27)	<0.001
	High vs none	1.38 (1.32, 1.44)	<0.001	1.19 (1.11, 1.27)	<0.001
Age	46 to 55 vs. ≤45	1.26 (1.19, 1.34)	<0.001		
	56 to 65 vs. ≤45	1.51 (1.42, 1.59)	<0.001		
	66 to 75 vs. ≤45	2.29 (2.15, 2.44)	<0.001		
	76 to 85 vs. ≤45	3.38 (3.18, 3.60)	<0.001		
	86+ vs. ≤45	4.98 (4.60, 5.38)	<0.001		
	≥ 75 vs. <75			1.66 (1.57, 1.74)	<0.001
Sex	Female vs. male	1.51 (1.45, 1.57)	<0.001	1.61 (1.51, 1.71)	<0.001
Comorbidity categories at baseline	Cardiovascular diseases	1.06 (1.01, 1.10)	0.018	1.16 (1.08, 1.24)	<0.001
	Neurologic impairments	1.49 (1.42, 1.57)	<0.001	1.66 (1.51, 1.82)	<0.001
	Endocrine, nutritional and metabolic disease	1.14 (1.06, 1.23)	<0.001	1.25 (1.12, 1.39)	<0.001
	Cardiovascular disease * Neurologic impairments	1.07 (1.00, 1.15)	0.043	1.00 (0.89, 1.11)	0.933
	Cardiovascular disease * Endocrine, nutritional, metabolic disease	0.99 (0.90, 1.08)	0.772	0.91 (0.80, 1.03)	0.123
	Neurologic impairments * Endocrine, nutritional, metabolic disease	1.08 (0.99, 1.18)	0.087	0.98 (0.87, 1.11)	0.794

AB: anticholinergic burden; HR: hazard ratio

REFERENCES

1. Darkow T, Fontes CL, Williamson TE. Costs associated with the management of overactive bladder and related comorbidities. Pharmacotherapy. 2005;25(4):511-9.

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7 www.ics.org/2018/abstract/7

EXTENDED FIRST UNINTERRUPTED SLEEP PERIOD FOR OLDER ADULTS FOLLOWING TREATMENT WITH AV002, AN EMULSIFIED MICRODOSE VASOPRESSIN ANALOG

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HYPOTHESIS / AIMS OF STUDY

Nocturia is a highly prevalent, under-recognized condition associated with disrupted sleep, reduced productivity, and negative impacts on overall health and health-related quality of life. The first uninterrupted sleep period (FUSP) is defined as the time from bedtime to first nocturic void (NOV) or awakening if no void occurred. The first 3-4 hours of sleep includes deep, slow wave, restorative sleep, which is correlated with improved productivity the next day. AV002 is an emulsified microdose vasopressin analog nasal spray approved for the treatment of nocturia due to nocturnal polyuria (NP). The effect of AV002 on FUSP and percentage of nights with ≤1 NOV were assessed in patients (pts) ≥65 years (y) and ≥75y in two Phase 3 randomized, double-blind pivotal studies.

STUDY DESIGN, MATERIALS AND METHODS

Patients with a history of ≥2 NOVs per night for ≥6 months (n=1333) were randomized to AV002 1.66mcg, AV002 0.83mcg, or placebo and treated for 12 weeks. FUSP and the percentage of nights with ≤1 NOV were measured. Safety evaluations included adverse events (AEs) and incidence of hyponatremia (moderate hyponatremia is defined as serum sodium 126-129 mmol/L and severe hyponatremia as ≤125 mmol/L).

RESULTS

By end of study, in both age groups the increase in FUSP (Table 1A) and percentage of nights with ≤1 NOV (Table 1B) from baseline were statistically significant compared to placebo in both treatment groups. Incidence and severity of AEs in the AV002-treated groups were similar to placebo. The incidence of hyponatremia was low for both doses (Table 2).

INTERPRETATION OF RESULTS

Both ≥65y and ≥75y patients treated with AV002 demonstrated significant improvement in duration of first uninterrupted sleep period and percentage of nights with ≤1 nocturic void. For both age groups, the mean first uninterrupted sleep period after treatment was greater than 4 hours for 1.66mcg group and approximately 4 hours for 0.83mcg group. No patients treated with 0.83mcg (recommended starting dose for patients ≥65 years old) had severe hyponatremia. These results suggest AV002 is an effective therapy with a favorable safety profile in older adults with nocturia due to nocturnal polyuria.

CONCLUDING MESSAGE

Addressing nocturia in older adults may result in better quality of sleep, increased productivity during the day, and improved overall health and health-related quality of life.

FIGURE 1

Table 1A: Mean Increase in First Uninterrupted Sleep Period (FUSP) (hr)

Group	Age ≥65y[1]	Age ≥75y[2]
1.66 mcg[3]	1.7[4,5]	1.7[4,5]
0.83 mcg[3]	1.5[4,5]	1.3[4,5]
Placebo[3]	1.1[4]	0.9[4]

[1] The mean FUSP after treatment for ≥65y was 4.1, 3.9, and 3.5 hr for 1.66 mcg, 0.83 mcg, and placebo group, respectively; the baseline FUSP was 2.4 hr for 1.66 mcg, 0.83 mcg, and placebo group
[2] The mean FUSP after treatment for ≥75y was 4.2, 3.8, and 3.4 hr for 1.66 mcg, 0.83 mcg, and placebo group, respectively; the baseline FUSP was 2.5 hr for 1.66 mcg, 0.83 mcg, and placebo group
[3] Patients were instructed to make every effort to administer the study medication approximately 30 minutes prior to bedtime
[4] P-value ≤0.0001 compared to baseline
[5] P-value ≤0.05 compared to placebo

Table 1B: Mean Increase in Percentage of Nights with ≤1 Nocturic Void (NOV) on a Per Patient Basis

Group	Age ≥65y[1]	Age ≥75y[2]
1.66 mcg[3]	43[4,5]	39[4]
0.83 mcg[3]	37[4]	32[4]
Placebo[3]	31[4]	28[4]

[1] After treatment, the percentage of nights with ≤1 NOV for ≥65y was 44%, 38%, and 32% for 1.66 mcg, 0.83 mcg, and placebo group, respectively; at baseline, the percentage was 1% for 1.66 mcg, 0.83 mcg, and placebo group
[2] After treatment, the percentage of nights with ≤1 NOV for ≥75y was 40%, 34%, and 29% for 1.66 mcg, 0.83 mcg, and placebo group, respectively; at baseline, the percentage was 1% for 1.66 mcg, 0.83 mcg, and placebo group
[3] Patients were instructed to make every effort to administer the study medication approximately 30 minutes prior to bedtime
[4] P-value ≤0.0001 for compared to baseline
[5] P-value ≤0.05 compared to placebo

FIGURE 2

Table 2: Percentage of Patients with Nadir Post-Baseline Serum Sodium Level Below Normal Range[1] (% (n))

	Age ≥65y			Age ≥75y		
Serum Sodium Levels	Placebo	0.83 mcg	1.66 mcg	Placebo	0.83 mcg	1.66 mcg
126-129 mmol/L	0.0 (0)	2.8 (7)	3.7 (9)	0.0 (0)	3.0 (3)	3.0 (3)
≤125 mmol/L	0.4 (1)	0.0 (0)	2.0 (5[2])	0.0 (0)	0.0 (0)	2.0 (2[2])

[1] Hyponatremic event was defined as serum sodium <130mmol/L
[2] 4 out of 5 patients in age ≥65y group and 1 out of 2 patients in age ≥75y group who experienced severe hyponatremia with AV002 1.66 mcg were also on corticosteroids; use of systemic or inhaled glucocorticoids is now a contraindication for AV002; serum sodium level ≤125 mmol/L occurred on study day 21, 29, 60, 71, 99, and 99; 4 patients were male and 1 was female in age ≥65y group; both patients were male in age ≥75y group

REFERENCES

1. Bliwise DL, Foley DJ, Vitiello MV, Ansari FP, Ancoli-Israel S, Walsh JK. Nocturia and Disturbed Sleep in the Elderly. Sleep Med. 2009 May; 10(5):540-548.
2. Stanley N. The Underestimated Impact of Nocturia on Quality of Life. Eur Urol Suppl. 2005;4(7):17-19.
3. Bosch JLH, Weiss JP. The Prevalence and Causes of Nocturia. J Urol. 2010;184(2):440-446.

Funding Avadel Specialty Pharmaceuticals, LLC. **Clinical Trial** Yes **Registration Number** U.S. National Library of Medicine, NCT01357356 and NCT01900704 **RCT** Yes **Subjects** Human **Ethics Committee** Western Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

8 www.ics.org/2018/abstract/8

NOVEL PROLONGED ACTION FORMULATION OF ACETAMINOPHEN-IBUPROFEN COMBINATION (PAXEROL®) THERAPY FOR TREATMENT OF NOCTURIA: A MULTI-CENTER, RANDOMIZED, DOUBLE BLINDED, PLACEBO-CONTROLLED, 4-ARM PHASE 2 TRIAL

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HYPOTHESIS / AIMS OF STUDY

Nocturia has been associated with significant morbidity, negative economic implications and decreased quality of life in those who suffer from it, yet there is currently no universally accepted treatment strategy for its management. A potential therapeutic target in the treatment of nocturia is the prostaglandin (PG) pathway, as PGs have been shown to play a role in modulating detrusor muscle tone and micturition. Thus, the purpose of our study is to assess the safety and efficacy of Paxerol®, a novel immediate:sustained (50%:50%) release formulation of the combination of PG inhibitors, acetaminophen and ibuprofen, at different doses in the management of patients with nocturia.

STUDY DESIGN, MATERIALS AND METHODS

We identified patients with nocturia without an underlying urinary tract infection, elevated post-void residual, sleep disorder, neurologic disorder or serious medical morbidity treated at multiple clinical sites from March 2016 through September 2017. A two-week, stratified (by gender, BMI, and age), four-arm, double-blind study comparing placebo to low, medium, and high doses of Paxerol® was conducted. Primary outcomes measured were average number of nocturnal voids (ANV) and nocturia quality of life scores (NQOL). Secondary outcome measures were duration of first uninterrupted sleep (DFUS), total hours of nightly sleep (THNS) and safety/tolerability. Differences between the treatment groups were compared using analysis of variance.

RESULTS

A total of 133 patients were screened, in which 86 were eligible and enrolled in the study. The full study protocol was completed by 80 patients (all 86 patients analyzed by intention to treat). There were no significant differences in the demographic and baseline voiding characteristics of study subjects amongst the four groups. We found a significantly greater decrease in ANV in patients treated with Paxerol® at all 3 doses as compared to placebo. There was a decrease in overall NQOL scores in all groups, with a significantly larger reduction in the medium and high dose Paxerol® groups compared to placebo. We found an increase in DFUS in all four groups, with a significantly larger increase in the high dose Paxerol® group compared to placebo. There was no significant difference in the THNS in the Paxerol® groups compared to placebo. There were no severe adverse events and none of the adverse events were believed to have been related to the study drug.

INTERPRETATION OF RESULTS

The significant decrease in ANV in each of the Paxerol® groups, combined with the significant improvement in NQOL scores in the medium and high dose Paxerol® groups compared to placebo, suggests that the effects in the medium and high dose groups has a positive subjective impact in patient's perception of their voiding symptoms. In addition, the observation that high dose Paxerol® demonstrated a significant increase in DFUS compared to placebo with no associated change in THNS suggests that patients found an improvement in their quality of sleep without a change in total duration of sleep. Our study was limited by its small sample size, lack of full bladder diary parameters analysis and short duration of therapy.

CONCLUDING MESSAGE

This Phase 2 trial demonstrated short-term safety and efficacy of Paxerol® for the treatment of nocturia symptoms compared to placebo. Further long term clinical studies are warranted to validate these findings.

FIGURE 1

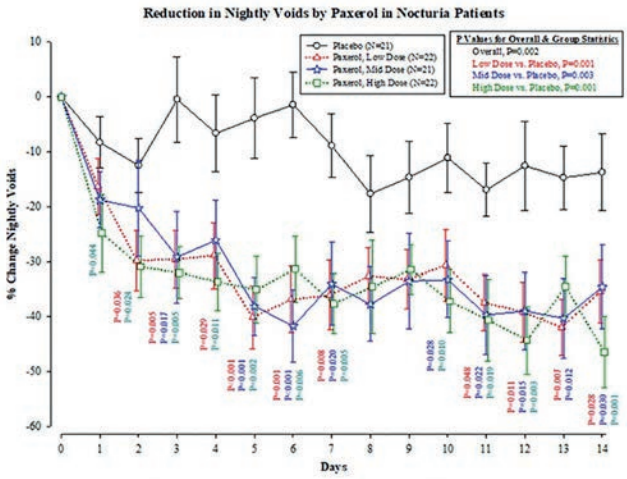

Figure 1: Percent changes (mean ± SEM) in nightly voids in the four treatment groups: placebo and Paxerol at low, mid and high doses.

FIGURE 2

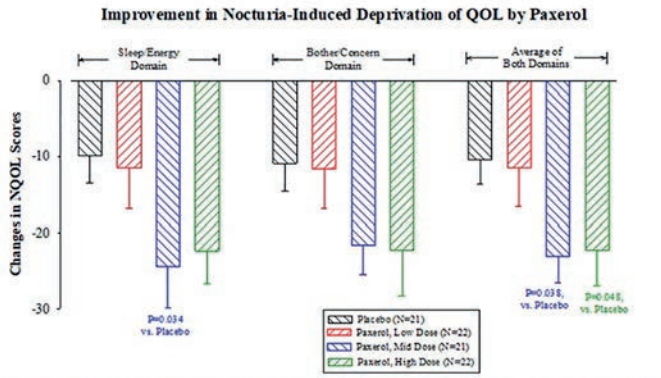

Figure 2: Reduction of NQOL scores, which reflect improvement in nocturia-induced deprivation of QOL, in patients with nocturia treated with different doses of Paxerol or placebo over two weeks.

Funding This study was supported and sponsored by Wellesley Pharmaceuticals, LLC. **Clinical Trial** Yes **Registration Number** NCT02646826 **RCT** Yes **Subjects** Human **Ethics Committee** Western Institutional Review Board - 1019 39th Avenue SE Suite 120, Puyallup, WA 98374-2115 **Helsinki** Yes **Informed Consent** Yes

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IN-HOSPITAL FALLS ASSOCIATED WITH NOCTURNAL TOILETING: A RETROSPECTIVE PILOT STUDY

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HYPOTHESIS / AIMS OF STUDY

In-hospital falls are common and can result in significant morbidity and mortality and additional hospital costs. The average rate of in-hospital falls is 4.8 falls per 1000 patient-days of observation based on incident reports.

The lower urinary tract symptoms of urinary urgency, incontinence, frequency and nocturia, have been identified as risk factors for in-hospital falls among older adults [1]. Older people with sleep disturbed due to nocturia have a markedly increased risk of injurious falls and death as compared to people who sleep through the night [2].

In a previous study, 50% of in-hospital falls was related to elimination, but the distribution between day and night was not described [3]. Taking into account the recommendations from the 6th international consultation on incontinence to perform research on the mechanisms, prevalence, incidence and remission rates of lower urinary tract symptoms in acutely hospitalised older people, the aim of this pilot study is to quantify the prevalence and fall-related injuries of in-hospital incident falls associated with nocturnal toileting.

STUDY DESIGN, MATERIALS AND METHODS

This single-centre retrospective pilot study was conducted at a tertiary referral hospital. All patients that had a registered in-hospital incident fall between 1 january 2015 and 31 december 2015 were included in the study. Patient falls were reported by nurses into the hospital incident reporting and learning system (irl).

Incident falls reported from paediatric, outpatient, diagnostic imaging, and emergency services were excluded as well as patients with incident falls during physical therapy sessions.

This database includes several variables (date, time interval, hospital service, fall mechanism and injury severity) and a description of the fall and injury. A fall was defined as an unexpected event in which the patient comes to rest on the ground, the floor or a lower level. Incident-falls associated with toileting were defined as a fall during an activity related to toileting, such as going to the toilet (or bedside commode) or using a urinal, dressing and cleaning.

A pearson chi-square test was used to compare characteristics of incident falls and day- and night time. P-values were two-sided and considered statistically significant at a value of <.05.

RESULTS

In 2015 the rate of reported falls was 1.7 falls per 1000 patient-days of observation, which means 484 incident falls. Thirty-seven incident falls were excluded (no time registration (n=7); paediatric, outpatient, diagnostic imaging or emergency services (n=22) and physical therapy (n=8)).

The retrospective evaluation was performed for 447 incident falls in 32 hospital services. Services with most reported incident-falls were geriatrics (n= 74), rehabilitation (n= 55), gastroenterology (n=34), haematology (n=30), and neurology (n=30).

Figure 1 shows characteristics of the incident falls. About half of the incident falls (n=242; 54%) occurred in the evening or during the night (8:00 pm-7:59 am). The most reported mechanisms of fall were loss of balance (26%) and slipping (25%). More than one third of the incident falls were related with going to the toilet (n=164, 37%). Incident falls associated with going to the toilet were more likely to occur during night time (n=125) than during daytime (n=39) (p<.001).

Most of the patients sustained no injuries (n=259, 58%). Severity of injury is presented in table 1 and no associations were found between fall characteristics (time interval and activity) and presence of injury.

INTERPRETATION OF RESULTS

The fall rate of 1.7 falls per 1000 patient days and the proportion of incident falls associated with nocturnal toileting (28%) based on incident reports is probably an underestima-

tion. First, approximately 20-25% of the incident falls are not reported in incident reports. However,

the rate of inpatient falls that were not reported in this incident reporting system is unknown.

Second, we couldn't link cases to patients, because of data de-identification in the irl. To determine which incident falls were related to going to the toilet and the severity of injury we relied on the location and description of the fall and injuries by the reporter in the irl.

In healthy people urine production during night time is lower than during daytime, hence one would expect the prevalence of incident falls associated with going to the toilet to be lower during night time than during daytime. In our study most of the incident falls associated with going to the toilet occurred during night time (76% vs 24%).

However, the results from this single centre, retrospective study based on incident reports limits the interpretation of our results. In the light of our findings, performing a multi-centre prospective study to identify factors contributing to the fall risk of nocturnal toileting in hospital care is recommended.

CONCLUDING MESSAGE

More than one quarter of all falls reported in-hospital is associated with nocturnal toileting. Minimizing the onset or worsening of nocturia could help prevent some in-hospital falls.

FIGURE 1

FIGURE 1 PREVALENCE OF IN-HOSPITAL INCIDENT FALLS ASSOCIATED WITH NOCTURNAL TOILETING

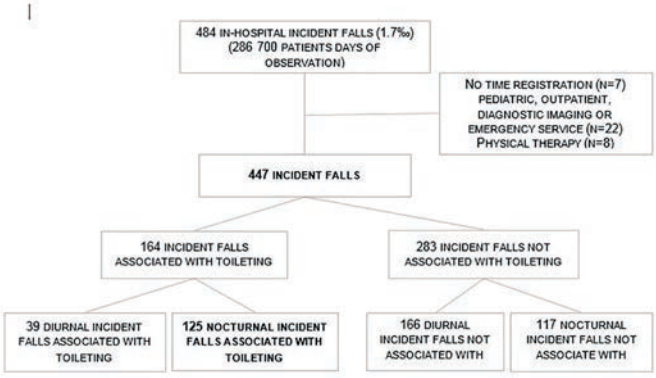

FIGURE 2

TABLE 1 FALL-RELATED INJURIES OF IN-HOSPITAL INCIDENT FALLS (N=447)

FALL-RELATED INJURY (N, %)	INCIDENT FALLS ASSOCIATED WITH TOILETING		INCIDENT FALLS NOT ASSOCIATED WITH TOILETING	
	♂ (N=39)	♀ (N=125)	♂ (N=166)	♀ (N=117)
NONE	22 (56)	62 (50)	107 (65)	68 (58)
MINOR	7 (18)	38 (30)	38 (23)	26 (22)
MODERATE	0	0 (0)	0	2 (2)
MAJOR	2 (5)	8 (6)	7 (4)	9 (8)
DEATHS	0	1 (1)	0	0
UNKNOWN	7 (18)	14 (11)	11 (7)	12 (10)
MISSING DATA	1 (3)	2 (2)	3 (2)	0

MINOR: SIMPLE INTERVENTION; MODERATE: SUTURES OR SPLINTS; MAJOR: SURGERY, CASTING, FURTHER EXAMINATION

REFERENCES

1. Vaughan cp et al. (2010) The association of nocturia with incident falls in an elderly community-dwelling cohort. Int j clin pract; 64(5): 577-583.
2. Nakagawa et al. (2010) Impact of nocturia on bone fracture and mortality in older individuals: a japanese longitudinal cohort study. J urol; 184(4): 1413-1418.
3. Hitcho e., et al. (2004) Characteristics and circumstances of falls in a hospital setting. J gen itern med; 19(7): 732-739.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Ghent University Hospital **Helsinki** Yes **Informed Consent** No

10 www.ics.org/2018/abstract/10

SAFETY AND EFFICACY OF DESMOPRESSIN ORALLY DISINTEGRATING TABLET 25/50MG IN PATIENTS WITH NOCTURIA AND MILD DAYTIME URINARY SYMPTOMS

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HYPOTHESIS / AIMS OF STUDY

Desmopressin orally disintegrating tablet (ODT) 25/50µg is to date approved in over 30 countries for symptomatic treatment of nocturia due to idiopathic nocturnal polyuria in adults. A large proportion of nocturia patients have idiopathic nocturnal polyuria and are therefore considered appropriate candidates for antidiuretic therapy using desmopressin. A substantial proportion of nocturia patients also have other daytime lower urinary tract symptoms (LUTS) due to overactive bladder (OAB) or benign prostatic obstruction (BPO). Little is known regarding the efficacy of desmopressin in nocturia patients with OAB or BPO, nor whether they are at risk of increased side effects with desmopressin treatment. The aim of this study was to analyse efficacy and safety data from two phase 3 trials of desmopressin ODT therapy in a subgroup of patients with nocturia and NP as well as mild daytime voiding dysfunction.

STUDY DESIGN, MATERIALS AND METHODS

Data were derived from two 3-month, phase 3 double-blind randomised placebo-controlled trials of desmopressin ODT in males (50/75µg; NCT01262456) and females (25µg; NCT01223937) with ≥2 voids per night during 3-day screening. Mild daytime LUTS associated with OAB/BPO were not specifically excluded, but concomitant medications for OAB/BPO (antimuscarinics, 5 alpha-reductase inhibitors, alpha-blockers) had to be stable for 3 months prior to screening. Medical history was used to exclude severe daytime voiding dysfunction (urge urinary incontinence >1 episode/day; urgency >1 episode/day; frequency >8 daytime voids/day). Patients with severe BPO (urinary retention or post-void residual volume >250mL; surgical treatment within the past

6 months; suspicion of bladder outlet obstruction or urine flow <5 mL/s) were also excluded. Nocturnal polyuria index (NPI) was recorded at baseline, with NPI>33% indicating NP. In this post-hoc analysis, only patients who enrolled with NP were included. Based on medical history or concomitant medication, patients were grouped into those with daytime symptoms, or without daytime symptoms (referred to as "pure NP"). For males, only those randomized to placebo or 50µg (not 75µg) desmopressin are included in this analysis. Baseline characteristics, nocturnal voids and safety parameters were investigated.

RESULTS

The subgroup used for this analysis included 196 women with "pure NP", 35 women with NP and OAB, 152 men with "pure NP" and 75 men with NP and OAB and/or BPO. Baseline voiding characteristics for patients with and without OAB and/or BPO were similar (Table 1).

Desmopressin ODT demonstrated similar efficacy in patients with pure NP and those with NP and OAB+/BPO in terms of reduction in nocturnal voids relative to placebo and percentage of patients achieving 33% reduction in nocturnal voids (Table 2). All groups showed greater improvement with desmopressin compared with placebo. Difference vs placebo in those with OAB+/BPO did not reach statistical significance due to small sample sizes.

Mild daytime urinary symptoms did not impact treatment comparison (judged by p value of treatment by symptom subgroup factor). The non-significant p-value of the treatment effect reflects the smaller sample size in those with mild daytime symptoms.

No worsening of daytime urinary disorders was noted from the recorded treatment-emergent adverse events. No significant increase in daytime voids was seen in any group except men with OAB+/BPO receiving desmopressin, who experienced 0.59 additional daytime voids per day. When patients with OAB/BPO were treated with the recommended gender-specific doses (25µg for women and 50µg for men), the incidence of severe (≤125mmol/L) and clinically significant (126–129mmol/L) hyponatraemia was low (Table 3), and all cases would have been captured by serum sodium monitoring.

INTERPRETATION OF RESULTS

Desmopressin demonstrates a similar safety and efficacy profile in nocturia patients with NP and mild daytime voiding dysfunction (OAB+/BPO) as in patients with pure NP. A small, clinically non-significant increase in daytime voids was observed in men with OAB+/BPO.

CONCLUDING MESSAGE

Nocturia patients with NP and mild daytime voiding dysfunction (OAB or BPO) were included in the phase III trials of desmopressin ODT for nocturia. Reduction in nocturnal voids in this subgroup was consistent with the reduction in voids for those with pure NP without daytime voiding dysfunction. No additional safety concerns were identified.

FIGURE 1

Table 1. Baseline voiding characteristics (mean [SD])

	Women		Men	
Full Analysis Set	Pure NP N=196	NP+OAB N=35	Pure NP N=152	NP+OAB+/BPO N=75
Nighttime voids	2.94 (0.894)	2.67 (0.600)	3.01 (0.874)	2.88 (0.814)
Daytime voids	5.47 (1.273)	5.95 (1.129)	5.50 (1.264)	5.73 (1.124)
Time to first nocturnal void(min)	142.81 (57.555)	142.00 (45.775)	137.47 (56.156)	153.51 (50.416)
Nocturnal polyuria index (%)	48.05 (11.479)	50.65 (11.410)	48.13 (10.995)	49.63 (11.149)
Nocturnal volume (mL)	640.29 (324.484)	689.14 (397.772)	646.11 (304.960)	659.92 (347.474)

FIGURE 2

Table 2. Change in number of nocturnal voids and percentage of patients achieving 33% reduction in nocturnal voids, with and without OAB/BPO – NP full analysis set

			Mean change in nocturnal voids	Difference in mean change (95% CI)	p value
Women	Pure NP	Desmopressin (n=101)	-1.54	-0.30 (-0.52; -0.08)	0.008
		Placebo (n=95)	-1.24		
	NP+OAB	Desmopressin (n=16)	-1.26	-0.24 (-0.90; 0.42)	0.460
		Placebo (n=19)	-1.02		
Men	Pure NP	Desmopressin (n=71)	-1.39	-0.35 (-0.60; -0.10)	0.007
		Placebo (n=81)	-1.04		
	NP+OAB+/BPO	Desmopressin (n=29)	-0.99	-0.32 (-0.73; 0.09)	0.124
		Placebo (n=46)	-0.67		
			Adjusted 33% responder probability	Odds ratio (95% CI)	p value
Women	Pure NP	Desmopressin (n=101)	79%	2.19 (1.33; 3.62)	0.002
		Placebo (n=95)	63%		
	NP+OAB	Desmopressin (n=16)	72%	1.60 (0.48; 5.33)	0.444
		Placebo (n=19)	61%		
Men	Pure NP	Desmopressin (n=71)	72%	2.13 (1.21; 3.75)	0.009
		Placebo (n=81)	55%		
	NP+OAB+/BPO	Desmopressin (n=29)	54%	1.76 (0.83; 3.74)	0.143
		Placebo (n=46)	40%		

Table 3. Serum sodium levels within OAB/BPO subgroup – NP Safety Analysis Set

Post-baseline serum sodium

	Women (n [%])		Men (n [%])	
	25µg (N=16)	Placebo (N=19)	50µg (N=29)	Placebo (N=47)
≥135mmol/L	13 (81)	18 (95)	25 (86)	47 (100)
130–134mmol/L	2 (13)	1 (5)	4 (14)	0
126–129mmol/L	1 (6)	0	0	0
≤125mmol/L	0	0	0	0

Funding Ferring Pharmaceuticals A/S **Clinical Trial** Yes **Registration Number** NCT01262456; NCT01223937 **RCT** Yes **Subjects** Human **Ethics Committee** Approval for each site included **Helsinki** Yes **Informed Consent** Yes

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POPULATION-BASED ANALYSIS OF THE RELATIONSHIP BETWEEN FALLS, FRACTURES AND NOCTURIA

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HYPOTHESIS / AIMS OF STUDY

Several reports have suggested an association of nocturia with an increased incidence of falls and fractures. However, most of these reports are based on case series and little information is available on cohorts representative for the general population and the implications of such associations for healthcare cost. Therefore, we utilized claims data from German statutory health insurances to further explore relationships between nocturia and falls/fractures as well as their cost implications.

STUDY DESIGN, MATERIALS AND METHODS

Our analysis is based on a pool of 4.85 million people enrolled in the German statutory health insurance system in 2014-2015. This data base was queried using ICD codes as surrogates for nocturia, since there is no specific code for nocturia itself (ICD Codes R35, R32, N39.3, N39.4, N32.8, F45.34), nocturia-related medications, and indicators of a tendency for falls/fractures (ICD Code R29.6). Per person data have been normalized for a 12 months period. Percent values refer to the total database.

RESULTS

The database included 157,076 (3.24%) patients with nocturia. Patients with nocturia had a 13% increased risk for falls compared to patients without nocturia (Table 1).

We then looked into the group of patients with a fall tendency. We found 11,695 subjects with a tendency for falls in the database, of whom 5,403 had documented falls (i.e. falls leading to a medical diagnosis). While people with a tendency for falls were older and had a greater Charlson comorbidity index, age and comorbidity were comparable in the subgroups with and without documented falls (Table 2). A high number of prescribed drugs (~10 per person) was observed in the group of patients with a tendency to fall. Presence of falls was associated with a 28% greater expenditure for hospital stay and medication.

Within the group of patients with a tendency for falls and documented falls, subjects with and without documented nocturia and subgroups of nocturia patients with and without micturition-related medication were compared (Table 3).

Within the group of patients with a tendency but not documented falls, subjects with and without documented nocturia and subgroups of nocturia patients with and without micturition-related medication were compared (Table 4).

INTERPRETATION OF RESULTS

Nocturia in itself seems to increase the risk for falls, leading to an increase in cost for statutory health insurances. Patients with a fall tendency were much older than the general population, had more comorbidities, and received more medications. Those with documented falls were not older and did not have more comorbidities but received by average one additional drug. The number of prescribed drugs per person was high in patients with fall tendency and nocturia across all subgroups. In patients with documented falls, those with additional nocturia caused more hospital and medication costs, and this was most pronounced in the subgroup with micturition-related medicines. In patient without documented falls we could not see marked difference regarding hospital and medication costs. A similar difference in healthcare cost was observed in patients with a tendency but no documented falls, but presence of micturition-related medications was not associated with a major cost difference.

CONCLUDING MESSAGE

We conclude that presence of nocturia is associated with greater healthcare cost in patients with a tendency to fall. In terms of polypharmacy reducing the overall number of drug treatments per person could be an attempt to reduce drug interactions and possibly stabilize patients fall tendency. Concomitant presence of micturition-related medications are associated with a cost difference in those with documented but not those without documented falls. Whether such medication is an indicator of high risk or a causative agent cannot be determined from this cross-sectional analysis. When treating nocturia, disease specific treatment and concomitant medications should be accounted for. Furthermore anamnestic data about nocturnal polyuria should be included, which accounts for more than 70% of patients with OAB and BOO.

FIGURE 1

Table 1: Fraction of patients with fall for patients with and without nocturia.

Fall	Nocturia	Patients	Sum	Fraction with fall
Without fall	Without Nocturia	4,536	8,163	44,4%
With fall	Without Nocturia	3,627		
Without fall	With Nocturia	1,756	3,533	50.3%
With fall	With Nocturia	1,777		

Table 2: Characteristics of overall data base and group with tendency for falls and subgroups with and without documented falls.

	Total group	Fall tendency		
		All	With falls	Without falls
Number	4,850,000	11,695 (0.24%)	5,403 (0.11%)	6,292 (0.13%)
Age, years	39.0	77.6	76.7	78.3
Charlson index	0.59	3.58	3.53	3.62
Prescribed drugs per person	3.4	10.1	10.7	9.7
Hospital and medication cost	1,214 €	6,198 €	7,032 €	5,483 €

FIGURE 2

Table 3: Characteristics of patients **with tendency and documented falls** with and without nocturia, including subgroups of patients with nocturia but with and without micturition-related medication

	No nocturia	With nocturia		
		All	With medication	No medication
Number	3,627 (0.07%)	1,777 (0.04%)	431 (0.01%)	1,346 (0.03%)
Age, years	74.5	81.2	79.3	81.7
Charlson index	3.22	4.13	4.51	4.01
Prescribed drugs per person	9.8	12.3	14.0	11.8
Hospital and medication cost	6,494 €	8,129 €	9,253 €	7,770 €

Table 4: Characteristics of patients **with tendency but no documented falls** with and without nocturia, including subgroups of patients with nocturia but with and without micturition-related medication

	No nocturia	With nocturia		
		All	With medication	No medication
Number	4,536 (0.09%)	1,756 (0.04%)	437 (0.01%)	1,319 (0.03%)
Age, years	77.5	80.3	79.0	80.7
Charlson index	3.34	4.31	4.70	4.17
Prescribed drugs per person	9.0	11.3	13.0	10.7
Hospital and medication cost	5,025 €	6,664 €	6,841 €	6,605 €

Funding The analyses were funded by Ferring Arzneimittel GmbH, Germany **Clinical Trial** No **Subjects** Human **Ethics not Req'd** it is a retrospective analysis of claims data **Helsinki** Yes **Informed Consent** No

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THE RELATION BETWEEN NOCTURNAL POLYURIA AND NON-DIPPING BLOOD PRESSURE IN MALE PATIENTS WITH LUTS

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HYPOTHESIS / AIMS OF STUDY

Nocturia is one of the most prevalent symptoms of LUTS. The causes of nocturia include bladder storage disorder, sleep disorder, and nocturnal polyuria. Nocturnal polyuria is considered the largest contributor among these factors. Relation between nocturia and non-dipping blood pressure has been already indicated. However, there is no study that indicated the relation between nocturnal polyuria and blood pressure variability. We hypothesized that nocturnal polyuria and blood pressure variability are related. In this study, we investigate the factors of nocturnal polyuria, and the relation between nocturnal polyuria and blood pressure variability in male patients with LUTS.

STUDY DESIGN, MATERIALS AND METHODS

242 male patients with LUTS who were treated recorded frequency volume charts. We investigated their urinary condition and characteristics, medical history, and medications based on their medical charts. 34 patients among these patients underwent ambulatory blood pressure monitoring (ABPM) for 24 hours to evaluate blood pressure variability.

Functional bladder capacity (FBC) is maximum voided volume. Reduced FBC is maximum voided volume of <4 ml/kg × body weight. Nocturnal polyuria is defined as Nocturnal polyuria index (Npi) >0.33.

We assessed the date according to the guidelines for the clinical use of 24-h ABPM (JCS 2010). Extreme dipper, dipper, and non-dipper were defined as nocturnal systolic blood pressure declined ≥20%,10-19%, and 0-9%, respectively. Riser was defined as nocturnal systolic blood pressure risen. We classified extreme dippers and dippers into "dipping", and non-dipper and riser into "non-dipping".

RESULTS

194 patients (81%) had nocturia and 136 patients (56.2%) had nocturnal polyuria. Among patients with nocturia (≥2 voids/night), 130 patients (67.0%) had nocturnal polyuria and 26 patients (13.4%) with nocturia had reduced FBC. Patients, who used two or more anti-hypertensives, were present at a significant higher rate in the nocturnal polyuria NP group than in the non- nocturnal polyuria NNP group (22.8% vs 12.3%, p=0.035). Patients with non-dipping blood pressure were present at a significant higher rate in the NP group (p = 0.037).

INTERPRETATION OF RESULTS

Among patients with nocturia who were treated, the frequency of reduced FBC was low(13.4%) and, the frequency of nocturnal polyuria was relativity high(67.0%).It was indicated that bladder storage disorders were adequately treated and, the approach for nocturnal polyuria might be needed for treatment for nocturia.

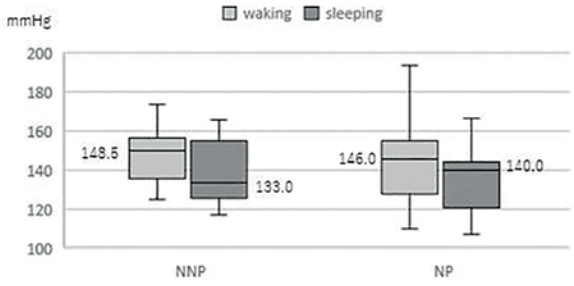
Patients who used two or more anti-hypertensives were present at a significant higher rate in the NP group than in NNP group. It was considered that nocturnal polyuria would have relation to resistant hypertension. Patients with non-dipping blood pressure were present at a significant higher rate in the NP group than NNP group. Our results suggest that nocturnal polyuria is related to non-dipping blood pressure.

CONCLUDING MESSAGE

Non-dipping blood pressure was considered to be a potential factor for nocturnal polyuria. We suggest that treatment of non-dipping blood pressure might improve nocturnal polyuria.

FIGURE 1

Figure : Systolic blood pressure during awaking and sleeping among the two groups



REFERENCES

1. Japanese Circulation Society, Japanese Society of Hypertension, Japanese College of Cardiology: Guidelines for the clinical use of 24 hour ambulatory blood pressure monitoring (ABPM) (JCS 2010)

Funding I have no potential conflict of interest to report **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee Ethics Committee**,Iwate Medical University **Helsinki** Yes **Informed Consent** Yes

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PREVALENCE AND RISK FACTORS OF NOCTURNAL POLYURIA IN FEMALE OVERACTIVE BLADDER SYNDROME

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HYPOTHESIS / AIMS OF STUDY

Nocturnal polyuria may decrease the treatment efficacy of overactive bladder syndrome (OAB); and adjuvant medication, such as desmopressin, may be needed for the treatment of nocturnal polyuria. The knowledge of prevalence and risk factors of nocturnal polyuria might be important for the treatment on OAB. Thus, our aim is to describe prevalence and risk factors of nocturnal polyuria in women with OAB.

STUDY DESIGN, MATERIALS AND METHODS

Between July 2009 and January 2018, all women with OAB visiting a medical center for evaluation were reviewed. The classification of OAB-wet or OAB-dry is based on the record of three-day bladder diary of each patient. The diagnosis of OAB in each patient was based on the presence of at least one episode of urgency in her three-day bladder diary and with the absence of stress urinary incontinence. The presence of at least one episode of urgency associated incontinence was defined to be OAB-wet, otherwise, OAB-dry.

Nocturnal polyuria was defined when the proportion of nighttime voided volume over 24-hour voided volume was greater than 33% for ≥65 year-old women, and when the proportion of nighttime voided volume over 24-hour voided volume was greater than 20% for <65 year-old women.

RESULTS

A total of 1,071 women with OAB, including 203 (19.0%) OAB-wet and 868 (81.0%) OAB-dry women, were included in this study.

The rates of nocturnal polyuria were 35.9% (257/715) in <65 year-old women, and 17.4% (62/356) in ≥65 year-old women (Table 1).

Factors predicting nocturnal polyuria included age, parity, OAB-wet, daytime frequency and nocturia episodes (Table 2).

Receiver operating characteristic curve analysis revealed nocturia episodes ≥ 5 in the three-day bladder diary was an optimal cut-off value to predict nocturnal polyuria (sensitivity = 85.6%, specificity = 61.0%; area = 0.80, 95% CI = 0.77 to 0.82). The areas under the curve of age, parity, OAB-wet and daytime frequency were only 0.57 (95% CI = 0.53, 0.60), 0.56 (95% CI = 0.52, 0.60), 0.53 (0.50, 0.55) and 0.57 (0.53, 0.61), respectively.

INTERPRETATION OF RESULTS

Nocturnal polyuria was not uncommon in women with OAB. However, nocturia episodes remained the only useful factor to predict nocturnal polyuria.

CONCLUDING MESSAGE

Nocturnal polyuria is not uncommon in women with OAB, especially in women with ≥ 5 nocturia episodes in her three-day bladder diary. In addition to standard pharmacotherapy for OAB, adjuvant therapy for OAB women with ≥ 5 nocturia episodes in three days might be needed for better treatment efficacy

FIGURE 1

Table 1. Prevalence of nocturnal polyuria in each age period of women with overactive bladder syndrome (n = 1,071)

Variables	Total	20-30	31-40	41-50	51-60	61-70	71-80	>81	P†
OAB	1071	28	86	163	311	282	163	38	-
Nocturnal polyuria	319 (30)	5 (18)	27 (31)	59 (36)	109 (35)	83 (29)	30 (18)	6 (16)	0.001

Data are presented with number (percentage).
OAB = overactive bladder syndrome.
†Chi2 test.

FIGURE 2

Table 2. Factors predicting the presence of nocturnal polyuria in women with overactive bladder syndromes (n = 1,071)

Variables	Values	Univariate		Multivariate	
		Odds ratio†	P†	Odds ratio‡	P‡
Age (years)	57.4±12.9	0.99 (0.98, 1.00)	0.005	0.97 (0.96, 0.98)	<0.001
Parity	2.5±1.4	0.85 (0.77, 0.93)	0.001	0.83 (0.71, 0.96)	0.01
OAB-wet	203 (19)	0.68 (0.48, 0.97)	0.03	0.61 (0.40, 0.93)	0.02
OABSS	6.8±2.8	1.07 (1.02, 1.11)	0.004	-	-
USS	1.9±1.0	0.93 (0.81, 1.07)	0.34	-	-
UDI-6	5.9±3.2	1.03 (0.99, 1.08)	0.18	-	-
IIQ-7	7.1±5.4	1.03 (1.00, 1.06)	0.04	-	-
Pad weight (g)	15.1±31.6	1.00 (1.00, 1.00)	0.82	-	-
Qmax (mL/s)	19.0±8.9	0.99 (0.97, 1.00)	0.17	-	-
Voided volume (mL)	259±122	1.00 (1.00, 1.00)	0.63	-	-
Post-void residual (mL)	43±40	1.00 (0.99, 1.00)	0.10	-	-
Strong desire to void (mL)	235±57	0.997(0.995, 0.999)	0.009	-	-
PdetQmax (cmH2O)	29.4±18.2	1.00 (1.00, 1.01)	0.41	-	-
MUCP (cmH2O)	68.6±34.0	1.00 (1.00, 1.00)	0.41	-	-
Daytime frequency	30.0±14.3	0.99 (0.98, 1.00)	0.04	0.92 (0.91, 0.94)	<0.001
Nocturia	5.5±4.3	1.30 (1.25, 1.36)	<0.001	1.52 (1.43, 1.61)	<0.001
Urgency	10.8±11.8	1.00 (0.99, 1.01)	0.80	-	-
Incontinence	0.0±0.4	0.98 (0.93, 1.02)	0.29	-	-

Data are presented with number (percentage) or mean ± standard deviation. Pseudo R2=0.27.
IIQ-7 = Incontinence Impact Questionnaire. MUCP = maximum urethral closure pressure. OAB = overactive bladder. OABSS = Overactive Bladder Symptoms Scores. PdetQmax = detrusor pressure at maximum flow rate. Qmax = maximum flow rate. SUI = stress urinary incontinence. UDI-6 = Urogenital Distress Inventory. USS = Urgency Severity Scales.
†Univariate logistic regression analysis
‡Multivariate logistic regression analysis

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Submitting **Helsinki** Yes **Informed Consent** No

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DEVELOPMENT OF NOCTURIA PHENOTYPES

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HYPOTHESIS / AIMS OF STUDY

The purpose of this study is to develop nocturia phenotypes that can be used to construct diagnostic and treatment pathways and to offer clues to identifying underlying causes.

STUDY DESIGN, MATERIALS AND METHODS

This is a retrospective multicenter study of patients evaluated for lower urinary tract symptoms (LUTS) who completed a 24-hour bladder diary (24HBD), the lower urinary tract symptoms score (LUTSS) questionnaire on a mobile app, website and/or paper, and uroflow (Q) and post-void residual urine (PVR). Those with nocturia once or more at night on a 24HBD were included. A panel of experts was convened to design the conceptual framework around which nocturia phenotypes could be constructed. The panel considered two general approaches – classifying patients according to age, sex, disease states such as benign prostatic hyperplasia, overactive bladder, pelvic organ prolapse, sleep apnea, peripheral edema, etc, or, according to physiologic variables such as 24-hour voided volume, bladder capacity, uroflow and post void residual urine. The panel chose the latter approach because it was their opinion that it is the underlying pathophysiology that dictates the rationale for treatment and that there is a commonality of therapeutic choices that transcends disease states. The phenotype classification system is depicted in table 1.

RESULTS

331 patients, 197 men and 134 women, completed the LUTSS and a contemporaneous 24H BD. 36 patients did not have contemporaneous Q and PVR results and were excluded , leaving 295 for analysis (201 men and 94 women). Nocturia, as defined as ≥1 nighttime void, was present in 228 (77%) of these patients (154 men and 74 women). Nocturia, ≥ 2 nighttime voids, was present in 50% of the cohort (148 patients). Demographic and clinical data is presented in table 2. The panel selected these variables for inclusion in the phenotype modelling: 24-hour voided volume (24HV), maximum voided volume (MVV), nocturnal voids, insomnia voids, nocturnal polyuria index (NPi), and uroflow and post void residual urine. Subjects were divided into five major phenotypes as depicted in table 1, according to the 24HBD as follows: polyuria (P), nocturnal polyuria (NP), small bladder capacity (SBC), mismatches (M), and sleep disorders (SD). Definitions are provided in table 1. Each major phenotype was subdivided based on MVV, Q and PVR, resulting in a total of 30 phenotypes. 6 phenotypes are excluded because they cannot exist; patients with a small bladder (MVV < 150 mL) have 2 possible phenotypes, and 'mismatches' must have a normal bladder capacity (MVV > 150 mL), leaving only 4 possible phenotypes, resulting in 22 total phenotypes.

INTERPRETATION OF RESULTS

Because the ultimate goal of this research is to use these phenotypic descriptions to develop treatment pathways, the 22 phenotypes described herein were developed by the panel based on expert opinion with respect to how they might be utilized to construct treatment paradigms. Further, they are not all mutually exclusive. For example, patients with P could also have NP. The panel did not make NP a subdivision of P because they believed that treatment of P alone is effective in reducing both NP and P in the vast majority of patients. Of course, 22 phenotypic groups are impractical for directing diagnosis and treatment in routine clinical practice. However, several factors have convinced us that this will ultimately prove to be a useful approach. Firstly, the categories are hypothetical and some phenotypes may be eliminated. Secondly, at the present time, there are limited OAB treatment options, so many of the categories will likely be lumped together to follow a single treatment path. Thirdly, the mere existence of some of these categories may stimulate further research to develop new treatment options. Finally, using artificial intelligence techniques, it is likely that diagnostic and treatment algorithms will be developed that can handle a large number of diverse phenotypes and present the physician with straightforward diagnostic and treatment paths without the need for the physician to be conversant in the phenotypic classification.

CONCLUDING MESSAGE

A phenotype classification system for nocturia based on expert opinion was devised, resulting in 22 phenotypes that were not all mutually exclusive. It is our goal to utilize and refine the data to provide the substrate for further research into the etiology of nocturia, new treatments and more precise treatment algorithms and clinical pathways.

FIGURE 1

Table 1: Nocturia Phenotypes. Nocturia is defined as ≥1 nighttime void on the 24HBD. MVV: small, < 150 mL, normal, 150 mL - 350 mL, large, > 350 mL. Q & PVR are defined as normal when Q_{max} > 12 mL/s and PVR ≤ 100 mL, and abnormal when Q_{max} ≤ 12 mL/s and/or PVR > 100 mL. Phenotype values are displayed as N (%) and are not mutually exclusive. Phenotypes denoted with an asterisk (*) are excluded because they cannot exist.

N=228	Reference values	N (%)	Small MVV	Normal MVV	Large MVV	Q & PVR
Polyuria	24HV > 2.5 L	54 (24%)	0	2 (4%)	24 (44%)	Normal
			0	7 (13%)	21 (39%)	Abnormal
Nocturnal polyuria	NPi > 0.33	64 (28%)	0	16 (25%)	12 (19%)	Normal
			6 (9%)	22 (34%)	8 (12%)	Abnormal
Small Bladder Capacity	MVV < 150 mL	11 (5%)	2 (18%)	*	*	Normal
			9 (82%)	*	*	Abnormal
Mismatches	night voids ≥1 NPi ≤ 0.33 MVV ≥ 150 mL	159 (70%)	*	27 (17%)	30 (19%)	Normal
			*	68 (43%)	34 (21%)	Abnormal
Sleep Disorders	≥1 insomnia void	24 (11%)	1 (4%)	5 (21%)	7 (29%)	Normal
			0	8 (33%)	3 (12%)	Abnormal

FIGURE 2

Table 2. Baseline characteristics for patients with nocturia. Displayed are mean ages with standard deviations, mean uroflowmetry parameters (Qmax, VV, & PVR), and mean diary parameters with ranges.

	Nocturia (≥1 void)	Men	Women	Nocturia (≥2 voids)	Men	Women
N	228	154	74	148	101	47
Age	64.0 (16.4)	63.9 (17.0)	64.3 (15.3)	67.1 (13.9)	67.8 (13.8)	65.7 (14.3)
Mean Q_{max}	14.3	12.5	18.1	12.9	11.5	15.7
Mean voided volume	210	190	249	186	175	209
Mean PVR	79	92	54	82	99	49
# Voids	11.4 (4-10)	11.3 (4-38)	11.3 (5-40)	12.3 (4-12)	12.1 (4-38)	12.3 (7-40)
# Day voids	8.7 (8-24)	8.8 (2-24)	8.6 (2-18)	8.7 (8-24)	8.8 (2-24)	8.4 (2-14)
# Night voids	2.7 (2-37)	2.6 (1-16)	2.7 (1-37)	3.5 (2-37)	3.5 (2-16)	3.6 (2-37)
# Incontinence voids	0.7 (0-14)	0.7 (0-14)	0.5 (0-6)	0.8 (0-13)	0.6 (0-13)	0 (0)
NBCi	2.0 (0-32.2)	1.9 (0-11.2)	2.2 (0.4-32.2)	2.4 (0.2-32.2)	2.2 (0.2-11.2)	2.7 (0.8-32.2)

Funding Institute for Bladder and Prostate Research (IBPR) **Clinical Trial** No **Subjects** Human **Ethics Committee** Western IRB (WIRB) **Helsinki** Yes **Informed Consent** No

15 www.ics.org/2018/abstract/15

NOCTURIA IN MALES WITH LUTS: PREVALENCE AND COMPARISON BETWEEN INTERNATIONAL PROSTATE SYMPTOM SCORE AND FREQUENCY-VOLUME CHARTS. AN OBSERVATIONAL, PROSPECTIVE DOUBLE-CENTRE STUDY.

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HYPOTHESIS / AIMS OF STUDY

Nocturia is a common complaint with a huge impact on quality of life that causes urologic consultation. At present, frequency volume chart (FVC) is an optimal tool for the evaluation of nocturia [1,2], but it is related to patient compliance and burden. The International Prostate Symptom Score (IPSS) is a widely used questionnaire in the outpatient evaluation and quantification of lower urinary tract symptoms (LUTS). Aim of the study was to evaluate the prevalence of nocturia in men complaining LUTS and the role of IPSS in men with nocturia.

STUDY DESIGN, MATERIALS AND METHODS

An observational, prospective study was performed involving two Urological Departments. 461 consecutive male patients with LUTS were recruited from September 2016 to November 2017. The following data were recorded: demographic characteristics, urological history, and self-administered IPSS. They were requested to complete a 3-days FVC, indicating "bedtime" and "waking time". The mean number of nightly voids was correlated to IPSS domains, in particular to: i) IPSS nocturia score (domain 7), ii) total IPSS score (domains 1-7), iii) IPSS quality of life score (domain 8). Statistical analysis was performed using T student and Mann-Whitney test and Bravais-Pearson correlation test.

RESULTS

162/461 patients (35%) completed both IPSS and 3-days FVC (mean age 70,95 ± 8.04 years). Prevalence of reported nocturia was 86,42%, with a mean number of nocturnal voiding of 1.36 ± 0,98 per night. Figure 1 shows distribution of mean episodes of nocturnal voiding per night. Figure 2 documents the difference in mean episodes of nocturia between IPSS and 3-days FVC (absolute values). The differences in episodes of nocturnal voiding between IPSS and 3-days FVC according to patients age are reported in Table 1. Table 2 shows the comparison of median IPSS domains 7, 8 and IPSS total score according to average number of nocturia episodes on the 3-days FVC. Considering a threshold of 70 years of age, no significant difference was found in episodes of nocturnal voiding between IPSS and mean number of nocturnal voiding at 3-days FVC according to patients age (Table 3). Median IPSS domain 7 and total IPSS score were higher when the mean number of night voids was > 1 ($p<0.001$). IPSS domain 8 did not reach any statistical difference ($p>0.05$). Bravais-Pearson correlation test showed a moderate positive correlation (+0,42) between the mean number of nightly voids on the 3-days FVC and IPSS 7.

INTERPRETATION OF RESULTS

This study showed a high prevalence of nocturia (86,4%) among patients complaining LUTS (according with other literature results). Most patients (62,34%) reported a discrepancy between IPSS nocturia score and mean nightly voids in the 3-days FVC, in particular in younger patients. The difference was high (>2) in an important part of the cohort (28%). Therefore IPSS nocturia score seems poorly reliable in the assessment of nocturia. According with previous data, overestimation of the nocturia episodes in the IPSS was more common than underestimation [3]. Poor correlation between IPSS domain of quality of life and nightly voids may suggest that also other factors are correlated to the patients bother and severity of urinary symptoms. Age did not affect the difference between IPSS and mean number of nocturnal voiding.

CONCLUDING MESSAGE

Due to his high prevalence, nocturia is one of the most complained among LUTS. The 3-days FVC remains the most important and reliable tool for the evaluation of males with LUTS and nocturia. IPSS is an easy and quick questionnaire, but its utility in the specific assessment of nocturia remains uncertain and, according to our data, almost inaccurate.

FIGURE 1

Figure 1. Distribution of mean episodes of nocturnal voiding (based on 3-days frequency volume charts).

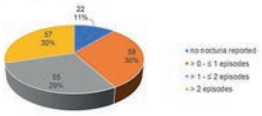

Figure 2. Difference (Δ) in episodes of nocturia between IPSS (domain 7) and mean number of nocturnal voiding at 3-days FVC (absolute values).

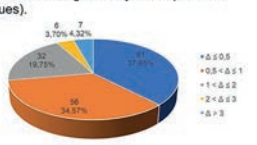

Table 1. Comparison of the differences in episodes of nocturnal voiding between IPSS and mean number of nocturnal voiding at 3-days FVC according to patients age.

	Age, years							
	<65		≥65 - <75		≥75		All ages included	
	N°	%	N°	%	N°	%	N°	%
IPSS 7 = FVC (±0,5)	11	32.35	22	33.33	28	45,16	61	37,66
IPSS 7 ≠ FVC (±0,5)								
• IPSS 7 > FVC	17	50,00	27	40,91	28	45,16	72	44.44
• IPSS 7 < FVC	6	17,65	17	25,76	6	9,68	29	17,90
Tot pts	34		66		62		162	

Table 2. Comparison of median IPSS 7, IPSS 8 and IPSS total score according to average number of nocturia episodes reported on the 3-days FVC. Statistical tests: * T Student test, ** Mann-Whitney U test. IQR= *interquartile range*.

	Average number of nocturia episodes reported on the 3-days FVC		
	≤1	>1	P value
N° patients	80	82	
IPSS 7 (median and IQR)	1.00 [1.00-2.00]	2.00 [1.00-3.00]	<0.001**
IPSS 8 (median and IQR)	1.00 [0.00-3.00]	2.00 [1.00-3.00]	>0.05**
IPSS tot (median and IQR)	6.00 [2.75-10.00]	9.00 [5.00-14.75]	<0.001**

Table 3. Difference in episodes of nocturnal voiding between IPSS and mean number of nocturnal voiding at 3-days FVC according to patients age.

	≤ 70 years	> 70 years	P value
IPSS = FVC (±0,5) (n = 61)	23	38	> 0,05

REFERENCES

1. Abrams P, Cardozo L, Fall M, The standardisation of terminology of lower urinary tract function: report from the Standardisation Subcommitee of the International Continence Society. Neurourol Urodyn 2002.
2. Cornu JN, Abrams P, Chapple CR, A contemporary assessment of nocturia: definition, epidemiology, pathophysiology, and management - a systematic review and meta-analysis. Eur Urol 2012
3. Ja Hyeon Ku, Sung Kyu Hong, Hyeon Hoe Kim, Is questionnaire enough to assess number of Nocturic episodes, Urology 2004.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Anonymous data, standard follow-up for LUTS **Helsinki** Yes **Informed Consent** Yes

16 www.ics.org/2018/abstract/16

REDUCING NOCTURIA IN COMMUNITY DWELLING OLDER PEOPLE WITH CARDIOVASCULAR DISEASE: A PROSPECTIVE STUDY TO MEASURE THE EFFECTS OF ACTIVE LEG ELEVATION

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HYPOTHESIS / AIMS OF STUDY

Background: Nocturia is defined as waking at night one or more times to pass urine, with each episode preceded and followed by sleep (1). It is a common symptom contributing to poor sleep, significant morbidity and decreased quality of life. The prevalence of nocturia is known to increase with age. The aetiology of nocturia is complex and multi-factorial; co-existing morbidities may be associated with causal pathways extending beyond the urinary system (2). In older people with cardiovascular diseases such as chronic heart failure, nocturia may be increased due to lower limb oedema associated with third space fluid accumulation (3). The resolution of peripheral oedema with recumbence can lead to increased circulating fluid. The increased circulatory volume overnight may exacerbate nocturia related to nocturnal polyuria.

Current treatments to reduce nocturia are multi-modal, comprising lifestyle, behavioural and pharmacotherapy interventions. Initial management with first-line conservative interventions is commonly recommended (3). Resting with legs elevated to promote reabsorption of extracellular fluid is recommended, but consensus varies around specific patient instructions. The effect of lifestyle interventions on nocturia frequency has not been widely researched in older people with comorbid conditions.

Aims: The aim of this study was to investigate the effect of active leg elevation immediately prior to sleep on reducing nocturia frequency, with the rationale of decreasing the volume of third space fluid reabsorbed from the lower limbs overnight. This study also investigated the effect of this intervention on the duration of first undisturbed sleep time, the total volume of urine produced overnight and nocturia-specific quality of life.

STUDY DESIGN, MATERIALS AND METHODS

Material and Methods:

A prospective single group pre-and post test study was conducted to evaluate calf exercises with 90 minutes of leg elevation for people with nocturia and pre-existing cardiac-related peripheral oedema. Additional inclusion criteria: aged 60 years and over, self-reported bilateral oedema of the lower legs which participants perceived to be worse at the end of the day. Exclusion criteria: any conditions associated with atypical nocturia, current urinary tract infection or bladder cancers. Participants unable to either rest comfortably supine or inability to measure their lower leg circumferences were also excluded. The recruitment period was between July and November 2017. Participants were recruited from an outpatient Continence Service of a tertiary hospital. The intervention was completed over a two-week period and monitored via home visits. Participants completed the intervention prior to going bed at night. The intervention consisted of 90 minutes rest in a supine position, ensuring legs and heart were raised to the same level. Active elevation required the participants to perform three sets of bilateral ankle dorsiflexion and plantar-flexion to activate calf pump muscles. Measurement tools: a three-day bladder diary for nocturia frequency and voided volumes, actigraphy for sleep patterns, patient-completed Nocturia-Quality of Life

questionnaire and self-measured lower leg circumference (morning and night) to quantify ankle oedema. Data analysis was performed using SPSS V25. Paired Students t-test or Wilcoxon signed rank tests were used to compare pre-post-intervention differences.

RESULTS

Twenty-one participants, seven males (33%), with a Mean age (SD) 79 years (11) were included in the study. Following the intervention, there was a statistically significant improvement in lower leg oedema (p=0.008) and nocturia-specific quality of life (p=0.001). No statistically significant difference in nocturia frequency (p=0.50), or first undisturbed sleep time (p=0.37) were identified. Nocturnal urine volume decreased by 180mL, with the difference approaching significance (p=0.09). Over 60% of participants self-reported non-adherence to the intervention on three or more nights.

INTERPRETATION OF RESULTS

In this multi-morbidity population, active leg elevation before bed reduced oedema and improved nocturia-specific quality of life. The reduction in overnight urine volume was insufficient to change the duration of first undisturbed sleep time or impact nocturia frequency. A better understanding of barriers to adherence with leg elevation is needed.

CONCLUDING MESSAGE

Findings from this study justify inclusion of leg elevation before bed in a package of care for patients with nocturia and co-existing peripheral oedema.

REFERENCES

1. Epstein M, Gerber JA, Weiss JP, Blaivas JG. Nocturia: Evaluation and Management. Current Bladder Dysfunction Report. 2017;12(1):95-103.
2. Madhu C, Coyne K, Hashim H, Chapple I, Milsom C, Kopp Z. Nocturia: risk factors and associated comorbidities; findings from the EpiLUTS study. International Journal of Clinical Practice. 2015;69(12):1508-16.
3. Bergman AM, Sih AM, Weiss JP. Nocturia: an overview of evaluation and treatment. Bladder. 2015;2(2):e13.

Funding Nil **Clinical Trial** No **Subjects** Human **Ethics Committee** Melbourne Health Human Research **Ethics Committee** and La Trobe University Human Research **Ethics Committee Helsinki** Yes **Informed Consent** Yes

17 www.ics.org/2018/abstract/17

NOCTURIA DIAGNOSIS IN LOWER URINARY TRACT SYMPTOM (LUTS) PATIENTS IS ASSOCIATED WITH DECREASED SLEEP QUALITY, WORK PRODUCTIVITY AND DAYTIME TIREDNESS: A PHYSICIAN AND PATIENT SURVEY

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HYPOTHESIS / AIMS OF STUDY

Nocturia is defined by the International Continence Society as 'the complaint that the individual has to wake at night one or more times to void.'[1] Several analyses have linked nocturia to both short-term and lifelong health consequences, including hypertension, congestive heart failure and disruptive mental and physical well-being. There is a relative paucity of data as it relates to sleep quality, daily activity impairment, and work productivity loss associated with nocturia diagnosis in LUTS in the US. This study aimed to examine the importance of providing accurate nocturia diagnosis in the absence or presence of overactive bladder or benign prostatic hyperplasia, commonly referred to as LUTS.

STUDY DESIGN, MATERIALS AND METHODS

Analysis was based on the Adelphi Lower Urinary Tract Symptoms Disease Specific Programme, a point-in-time survey of physicians and consulting patients conducted in 2013. Urologists, Gynecologists, and Primary care physicians in the US, completed patient record forms for the next 14 patients, detailing patient demographics and diagnoses including OAB, BPH and nocturia, or combinations. Patients were invited to complete a separate patient self-completion form (PSC) which included mean number of night-time voids over the last week, length of first undisturbed sleep period before voiding, frequency of feeling tired during the day, mean number of daytime naps (over 5 minutes) taken over the last week, degree of bother over disturbed sleep, frequency of sleep disturbance impacting partner, and validated patient-reported outcomes including the Overactive Bladder Questionnaire (OAB-q), the Nocturia Impact (NI) Diary and the Work Productivity and Activity Impairment (WPAI) questionnaire. Patients were stratified into two groups based on the presence/absence of a nocturia diagnosis as deemed by the physician. Mann-Whitney U and Fisher's Exact tests were performed to assess significance between patient groups. Analysis were restricted to those patients who completed a PSC. All tests were two-sided with a significance p-value of 0.05.

RESULTS

In total, 148 physicians provided data on 2086 LUTS patients, of which 702 (334 PSCs) had a diagnosis of nocturia and 1367 (776 PSCs) had no diagnosis of nocturia. The two patient groups were comparable as measured by age, gender, and body mass index. Median age of patients completing a PSC (1110) was 65.0 years, and 54% were male. Compared with

patients without nocturia, those with a nocturia diagnosis reported a significantly higher mean number of night-time voids (3.0 versus 2.1; p<0.0001) and significantly more naps taken during the day (mean 0.8 versus 0.7; p=0.0343). A larger proportion of nocturia patients reported waking after less than 3 hours' sleep to urinate (86% versus 74%; p=0.0002), feeling tired during the day (62% versus 43%; p<0.0001) and being bothered by their nighttime urination (bothered = "quite a bit" or "a great deal" or "a very great deal"; 49% versus 21%, p<0.0001). In addition, patients with a nocturia diagnosis reported worse symptom severity as measured by the OAB-q Symptom Severity Questionnaire (mean 36.2 versus 27.1; p<0.0001) and health-related quality of life as measured by the OAB-q Total HRQL Score (mean 66.9 versus 75.2; p<0.0001). Patients also reported lower scores on daily activity as measured by NI Diary (mean 33.6 versus 24.8; p<0.0001) and total impact (mean 41.6 versus 25.9; p<0.0001) on the NI Diary Q-12 and higher levels of overall work impairment (mean 28.2 versus 20.6; p=0.0048) and activity impairment (mean 33.9 versus 26.5; p<0.0001) as measured by the Work Productivity and Activity Impairment Index.

INTERPRETATION OF RESULTS

A significant portion of LUTS patients in the US also suffer from nocturia. Furthermore, these data suggest a link between nocturia diagnosis in US LUTS patients to sleep disturbances, disruption of daily activities, work productivity and activity impairment, as well as quality of life.

CONCLUDING MESSAGE

This study underscores the importance of appropriate diagnosis and treatment of nocturia patients. Future studies that address gaps in knowledge between nocturia diagnosis and associated economic burden are warranted.

REFERENCES

1. The Standardisation of Terminology in Nocturia: Report from the Standardisation Sub-committee of the International Continence Society. Neurourology and Urodynamics 00:179-183 (2002) DOI 10.1002/nau.10053

Funding Ferring Pharmaceuticals Inc. **Clinical Trial** No **Subjects** Human **Ethics Committee** European Pharmaceutical Market Research Association 2012 & US Health Insurance Portability and Accountability Act 1996 **Helsinki** Yes **Informed Consent** Yes

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RAPID NOCTURIA EFFICACY OF AV002, AN EMULSIFIED MICRODOSE VASOPRESSIN ANALOG

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HYPOTHESIS / AIMS OF STUDY

Nocturia is a highly prevalent, under-recognized condition associated with disrupted sleep, reduced productivity, and negative impacts on overall health and health-related quality of life. Oftentimes, it is unclear whether a therapy is effective for nocturia given the lengthy time to confirm responsiveness, if at all. Hence, the rapidity of effect on nocturia is of keen interest. ≥2 nocturic voids (NOVs) is associated with decreased quality of life. Achieving a reduction of 0.5 NOVs is clinically significant. First uninterrupted sleep period (FUSP) is defined as the time from bedtime to first nocturic void or awakening if no void occurred. The first 3-4 hours of sleep includes deep, slow wave, restorative sleep, which is correlated with improved productivity. AV002 is an emulsified microdose vasopressin analog nasal spray approved for the treatment of nocturia due to nocturnal polyuria. The effect of the first dose of AV002 on the number of NOV and FUSP were assessed in patients in two Phase 3 randomized, double-blind pivotal studies.

STUDY DESIGN, MATERIALS AND METHODS

Patients ≥50 years old with a history of ≥2 NOVs per night for ≥6 months (n=1333) were randomized to AV002 1.66mcg, AV002 0.83mcg, or placebo and treated for 12 weeks. After first dose, number of NOV and FUSP were measured. Safety evaluations included adverse events (AEs) and incidence of hyponatremia (moderate: 126-129 mmol/L; severe: ≤125 mmol/L).

RESULTS

After first dose, reduction in NOV and increase in FUSP from baseline were significant in both treatment groups (Table 1). Throughout the study, incidence and severity of AEs in AV002-treated groups were similar to placebo. The incidence of hyponatremia was low for both doses.

INTERPRETATION OF RESULTS

After first dose, patients treated with AV002 demonstrated significant reduction of nocturic voids and improvement in duration of first uninterrupted sleep period. These results suggest AV002 has rapid efficacy with a favorable safety profile in patients with nocturia due to nocturnal polyuria.

CONCLUDING MESSAGE

Rapidly addressing nocturia after first dose enables clinicians and patients to quickly confirm responsiveness while providing confidence in ongoing therapy.

FIGURE 1

Table 1: Mean Reduction in Nocturic Voids (NOVs) and Mean Increase in First Uninterrupted Sleep Period (FUSP) After First Dose

Group	Reduction in NOVs[1] After First Dose (Number)	Increase in FUSP[2] After First Dose (Hour)
1.66 mcg[3]	1.4[4,5]	1.5[4,5]
0.83 mcg[3]	1.2[4]	1.5[4,5]
Placebo[3]	1.0[4]	0.9[4]

[1] The mean NOVs after first dose was 1.9, 2.0, and 2.3 for 1.66mcg, 0.83mcg, and placebo group, respectively; the mean NOVs at baseline was 3.3, 3.2, and 3.3 for 1.66mcg, 0.83mcg, and placebo group, respectively
[2] The mean FUSP after first dose was 3.9, 3.9, and 3.3 hours for 1.66mcg, 0.83mcg, and placebo group, respectively; the mean FUSP at baseline was 2.4 hours for 1.66mcg, 0.83mcg, and placebo group
[3] Patients were instructed to make every effort to administer the study medication approximately 30 minutes prior to bedtime
[4] P-value ≤0.001 compared to baseline
[5] P-value ≤0.05 compared to placebo

REFERENCES

1. Bliwise DL, Foley DJ, Vitiello MV, Ansari FP, Ancoli-Israel S, Walsh JK. Nocturia and Disturbed Sleep in the Elderly. Sleep Med. 2009 May; 10(5):540-548.
2. Stanley N. The Underestimated Impact of Nocturia on Quality of Life. Eur Urol Suppl. 2005;4(7):17-19.
3. Bosch JLH, Weiss JP. The prevalence and causes of nocturia. J Urol. 2010;184(2):440-446.

Funding Avadel Specialty Pharmaceuticals, LLC. **Clinical Trial** Yes **Registration Number** U.S. National Library of Medicine, NCT01357356 and NCT01900704 **RCT** Yes **Subjects** Human **Ethics Committee** Western Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

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USER EVALUATION OF WEB-BASED INFORMATION FOR MEN WITH INCONTINENCE AFTER TREATMENT FOR PROSTATE CANCER

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HYPOTHESIS / AIMS OF STUDY

INTRODUCTION Long-term urinary incontinence (UI) is a common consequence of radical prostatectomy (RP) (1) that can have a serious adverse impact on men's lives leading to isolation, depression (2) and, sometimes, decision regret (3). Men may be inadequately prepared for managing their indwelling catheter and for the incontinence that is common after its removal.

Following interviews with 35 men and together with a panel of nine public patient representatives, we developed a new Prostate Continence website which offers multi-media resources (product selector tool, patient interviews and product use videos, PDFs and illustrations) to help men to prepare for having a catheter after surgery and for short-term, and possibly long-term, UI. We report here a study to evaluate that website.

AIMS OF THE STUDY To evaluate the value and utility to men of a novel prostate continence website and to identify areas for further improvement:

• To determine, describe and evaluate men's views about the website;

• To evaluate the comprehensiveness of the website and identify any gaps;

• To test the functionality of the website (on a PC) i.e. ease of navigation through the site and new functions e.g. suppliers' database;

• To identify further opportunities to improve the information and functionality required.

STUDY DESIGN, MATERIALS AND METHODS

A mixed method study using:

• Self- completion questionnaires designed for the study and partially derived from the validated Judge questionnaire about health information-seeking;

• Semi-structured interviews about the content and utility of the website, its comprehensiveness, ease of use and areas for further improvement;

We observed the men navigating the website which we recorded using Echo 360 personal capture software.

Sample: Up to 16 men with current or recent experience of incontinence post RP who were not involved in the development of the website. Recruitment was through prostate cancer support groups and urology outpatient clinics.

Data analysis:

Questionnaire data (quantitative): Descriptive statistics.

Interview data (qualitative): Transcripts of the audio recordings from the observations and thematic analysis from the semi-structured interviews.

RESULTS

Twelve men (3 x 40-59yrs; 8 x 60-7yrs; 1x non-responder) were recruited of whom nine had UI daily (n=3) or day and night (n=6) following either robotic (n=9) or laparoscopic (n=3) RP (mean length of time since onset 28 months). Subsequent to their RP, three men had also received an artificial urinary sphincter (AUS) to treat their UI. All those currently incontinent, including one man with an AUS, regularly used pads as their main method of containment. Although all were regular internet users for emails, shopping and information-seeking, there was a wide range of skill demonstrated when moving around the website.

Participants' views about the website

Questionnaire responses

All men found the website to be very helpful (11/12) or quite helpful (1/12) and all of them would recommend the website to others. Detailed responses in Figure 1.

Interviews

Example quotes illustrating typical views are shown in Figure 2.

Men agreed that having the website available to them prior to their surgery would have been helpful. Having the comprehensive information in one place and in a user friendly format would have helped allay fears about what to expect after surgery:

"Forewarned is forearmed and the information contained takes away some of the fear and allows you to think about relevant questions you might need to ask. It helps you to deal with your situation more easily and confidently"

"Prepares them removing the unknown and knowing the questions to ask of the professionals."

Men were asked how the website might have helped them to prepare for post-operative recovery, catheter care and post-surgical incontinence. They were also asked about specific aspects of the website.

INTERPRETATION OF RESULTS

The evaluation has highlighted strengths and weaknesses of this website which was co-produced with men and provided data that validated the user content. The evaluation also describes some weaknesses that could be rectified. Of particular value were the 'real life' stories and videos which were perceived as indicating that they were 'not the only ones'. Interestingly some men emphasised the need for information 'at the right time' – that might not always be just before surgery when they are often focussing on their cancer diagnosis. All men felt it would have been helpful to have had access to the website before their surgery. A study limitation is our presence while the men reviewed the website which may have influenced their responses.

The Prostate Continence website (www.prostatecontinence.org) is part of the Continence Product Advisor (www.continenceproductadvisor.org) which has >4000 worldwide visitors weekly. Both websites are global resources to which health care professionals (HCP) and men have free access. Improvements to the website relate to ensuring that excess text is removed and sections link correctly. Evaluation of the website for product selection in primary care is currently taking place.

CONCLUDING MESSAGE

This evaluation demonstrates that the Prostate Continence website, produced in partnership with men, provides comprehensive product information that, combined with media resources, helps men to feel less isolated and more prepared to manage their catheter and urinary incontinence after RP. This resource may help HCPs provide support for men before and after surgery.

FIGURE 1

Figure 1: How useful do you think the website would have been for you when:	Very helpful	Quite helpful	Neither helpful nor unhelpful	Unhelpful	Very unhelpful
When preparing for bladder leakage?	8	4	0	0	0
Looking after your catheter in hospital? (n=10)	5	4	1	0	0
Looking after your catheter at home? (n=11)	9	2	0	0	0
Having your catheter removed? (n=10)	7	3	0	0	0
Coping with incontinence in the first days/weeks after treatment?	10	2	0	0	0
Coping with incontinence long-term? (n=11)	8	3	0	0	0

FIGURE 2

Figure 2: Themes from qualitative analysis with selected comments:

Product information – covering what, how and where:

"I didn't know there were so many products for urinary and bowel incontinence. I hope I won't need them - I had a prostatectomy and am mainly over incontinence but I will need radiotherapy and I am better informed on the range of incontinence products I might need."

Hearing other men's experiences:

"Reassurance that I am 'typical'", "hearing other men's stories - the emotional and psychological impact)".

Catheter-related procedures, tips and practical product use all in one place:

"Detailed descriptions both verbally and visually of procedures and products"

Quantity of information:

"There may be a thought that there is too much information but it's better than having to go to different sites to gain all this information".

Need for improvement to navigation and links:

"I think it's all useful and needs to be there - just think about the navigation, the use of links and the amount of text."

REFERENCES

1. Milsom I et al. Epidemiology of urinary incontinence (ui) and other lower urinary tract symptoms (luts), pelvic organ prolapse (pop) and anal (ai) incontinence in Incontinence 6th Edition 2017 Volume 1 Editors: P Abrams, L Cardozo, A Wagg, A Wein.
2. Sharpley CF, Bitsika V, Christie DR. Understanding the causes of depression among prostate cancer patients: development of the effects of prostate cancer on lifestyle questionnaire Psycho-oncology. 2008 Jul
3. Albkri A et al. Urinary incontinence, patient satisfaction, and descisional regret after prostate cancer treatment: A French national study. Urologia Internationalis. 2018; 100:50-56. DOI:10.1159/000484616.

Funding This work was funded by the Movember Foundation in partnership with Prostate Cancer UK as part of the TrueNTH programme **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** London Stanmore Research **Ethics Committee** Ref: 16/LO/2223 **Helsinki** Yes **Informed Consent** Yes

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APP-BASED TREATMENT FOR WOMEN WITH URINARY INCONTINENCE: WHAT DO PATIENTS EXPERIENCE AND PREFER?

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HYPOTHESIS / AIMS OF STUDY

eHealth is emerging and potentially has advantages for the treatment of UI in women. Especially, the use of mobile health applications (apps) may increase adherence to treatment advices and therewith reduce costs for UI management (1). Although various apps aimed at supporting the treatment of UI are currently available, little is known about the expectations and preferences of users of these apps and whether their expectations correspond with their actual experiences. This lack of knowledge may result in poor implementation of a possibly effective application.

The aim of this study is to explore experiences and preferences regarding usability of an app-based treatment for UI in women

STUDY DESIGN, MATERIALS AND METHODS

We performed a qualitative usability study as part of an extensive process evaluation alongside a randomized controlled trial (RCT) evaluating an app-based treatment for stress, urgency and mixed UI in women.

We invited women applying the following inclusion criteria: age ≥ 18 years, suffering from self-reported stress, urgency or mixed UI at least twice a week according to the 3 Incontinence Questions (3IQ), a wish for treatment and access to a smartphone or tablet. Exclusion criteria were: indwelling urinary catheter, urogenital malignancy, previous surgery for UI, treatment for UI in the previous year (pharmacologically or non-pharmacologically), terminal or serious illness, cognitive impairment or psychiatric disorders, urinary tract infection, overflow or continuous UI, pregnancy or recent childbirth (< 6 months ago) or the inability to complete a questionnaire in Dutch.

We recruited women who fulfilled the inclusion criteria, but who did not participate in the RCT to avoid the chance of influencing the RCT. For this, we invited women who had contacted their GP for UI in the past 10 years through an information letter. After checking for in- and exclusion criteria by the researcher and written informed consent, participants filled in a short questionnaire on patient characteristics, UI severity, comorbidity, drug use and previous experience with the internet.

Participants used the App during 6 weeks, after which semi-structured interviews were held to explore preferences and experiences regarding the usability of the App. Questions included in the interview guide were based on the Technology Acceptance Model (TAM). TAM is a validated instrument to use in a healthcare setting and is good at predicting the use of eHealth. Additionally, questions on experiences with specific app functions were asked. Automatically logged data on app-usage were collected and used to further guide the interviews. Interviews were conducted at the patients GP practice and recorded using a digital voice recorder after which they were transcribed verbatim. Transcriptions were coded in duplicate by two researchers, using nVivo and checked for consensus. Recruitment of participants continued until saturation was reached (i.e. no new themes emerged during the interviews). Data analysis was driven by an inductive approach, which allowed themes to emerge from the data by constant comparison.

RESULTS

Nine women, age 32 to 68 years, participated (saturation was reached after 9 interviews). The duration of UI complaints ranged from 1.5 to 26 years. Participants had urgency UI (3), stress UI (1), mixed UI (2), urgency-predominant mixed UI (2), and stress-predominant mixed UI (1). Four women indicated that they used incontinence pads on a daily basis. The ICIQ-SF score ranged from 2 to 13, indicating a low to moderate self-perceived severity of UI.

Data analysis generated the following four main themes:

Accessibility: this covers ease of use and how this relates to privacy. Most participants experienced the app as convenient; it made UI care and treatment easily accessible. Some participants stated that the app made it easier to receive treatment while keeping their UI symptoms private. These participants mentioned that they disliked discussing their symptoms with others and that fear of internal examination kept them from seeking help. In contrast, some participants also mentioned that they found it easier to talk about their symptoms after they started using app.

Awareness: participants mentioned that the use of the app enhanced their awareness of their symptoms. Some participants realized that their symptoms were worse than they had previously thought. For some this was an unpleasant and confronting experience. Several participants also expressed that they became more aware of the treatment possibilities for UI and that the app made them more aware of their coping strategies and ways how these could be improved.

Usefulness: this covers the perceived usefulness of the app, describing ways in which the app is serving a purpose for the user. Seven participants stated that overall they were positive about the usefulness of the app and would recommend the app to other women with UI. Furthermore, the majority of the participants stated that they would probably use the app in the future.

Adherence: this covers the time it takes to be engaged with the app, to adhere to the treatment and factors that promote adherence. The majority of participants mentioned that they found it difficult to do the exercises on a regular basis, because they felt they were too busy with work or private life to invest time in the app treatment. In contrast, one participant

mentioned that the app is especially suitable for people with busy schedules. Participants stated that the reminder function of the app promoted adherence to the treatment. Also, some women noted that symptom improvement was motivated them to continue doing the exercises. Another participant stated that the display of her progress in the graphs was motivational.

INTERPRETATION OF RESULTS

The results of this study provide insight into whether an app based treatment for UI fits the needs of its users. In general, women appreciated the increased accessibility of UI healthcare and possibility of 24/7 support. It enabled them to do the exercises at their own time and pace. These findings are in line with a previous study, which reported that a smartphone-based therapy for depression felt more accessible and present in patients' everyday lives. In our study, some women were specifically attracted by the sense of privacy with the app-based treatment. Women were able to receive healthcare and treat their symptoms without having to consult a healthcare provider. On the other hand, some women experienced usage of the app had lowered barriers to talk about their UI complaints. Similar findings were reported in a study evaluating a treatment program for SUI without face-to-face contact, which described it breaking down some of the shame barriers.

An important challenge in long-term adherence to UI treatment is fitting the exercises into patients' daily lives. Women in this study stated that they regularly forgot to do the exercises and mentioned that the reminder function of the app was an important feature; it supported them in reminding to do the exercises. This is in line with existing literature, which confirms the importance of reminder functions in eHealth tools. Other motivators to continued use of the app were symptom improvement and progress in exercise program.

The greatest barrier to adherence mentioned by participants was being too busy. And even though women appreciated the fact that UI health care was accessible without health care provider consultation, several participants also mentioned the possible additional value of health care support. This is in line with studies on eHealth which show that adherence was low in the absence of face-to-face contact with a healthcare provider, possibly due to the lack reduced feelings of obligation (2). The results of this study indicate similar issues.

CONCLUDING MESSAGE

This is the first study exploring experiences and preferences of women regarding an app-based treatment for all three types of urinary incontinence (UI), i.e. stress, urgency and mixed, with the use of in-person interviews

Research has shown that patients may experience many barriers in the use self-care applications resulting in poor implementation of the application. Therefore, it is strongly advised to take into account the experiences and expectations of important stakeholders, like patients (3).

In this study barriers and facilitators were explored, providing insight not only for treatment effects of a mobile application in the treatment of UI but potentially also for other future eHealth applications. By combining these results with experiences and expectation of other stakeholders like healthcare providers and with data on the (cost)effectiveness from the RCT ('mixed methods') we will be able to provide a complete picture of the introduction of an e-Health app for treatment of UI in women.

REFERENCES

1. Hamine S, Gerth-Guyette E, Faulx D, Green BB, Ginsburg AS. Impact of mHealth chronic disease management on treatment adherence and patient outcomes: A systematic review. J Med Internet Res. 2015;17(2):1–15
2. Knowles SE, Lovell K, Bower P, Gilbody S, Littlewood E, Lester H. Patient experience of computerised therapy for depression in primary care. BMJ Open. 2015;5(11):e008581.
3. Nijland N, Van Gemert-Pijnen J, Boer H, Steehouder MF, Seydel ER. Evaluation of internet-based technology for supporting self-care: Problems encountered by patients and caregivers when using self-care applications. J Med Internet Res. 2008;10(2)

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FACTORS ASSOCIATED WITH COMPLETING SELF-MANAGEMENT AND ACHIEVING IMPROVEMENT WITH A FREE MOBILE APP FOR URINARY INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

Self-management via a mobile app is a new, cost-effective method for delivering first-line treatment for urinary incontinence (1, 2). The aim of this study was to analyse which factors were associated with completing self-management and with improvement when the app was made freely available for everyone.

STUDY DESIGN, MATERIALS AND METHODS

A pragmatic, observational study evaluated the implementation of a mobile app focused on Pelvic Floor Muscle Training (PFMT). When downloading the mobile app Tät®, the user was informed about the study and asked to answer a questionnaire. The participant provided information on age, educational level, current residence, app language and the validated ICIQ- UI SF questionnaire (International Consultation on Incontinence Modular Questionnaire – Urinary Incontinence Short Form). If still using the app after 3 months, the user was asked to answer a follow-up questionnaire. This included the ICIQ-UI SF, the validated PGI-I questionnaire (Patient Global Impression of Improvement) and questions on frequency of PFMT and app use. Answering the questionnaires were optional and submitting the questionnaires was considered as consenting to participation. Questionnaires were submitted anonymously and could not be traced back to the participant.

The study included participants who downloaded the app between May 2015 and April 2017. The inclusion criteria were age ≥18 years and urinary incontinence, defined as reporting any frequency and any amount of leakage in the ICIQ-UI SF questionnaire. The answers from the baseline questionnaire were analysed using multivariate logistic regression for association with completed self-management (defined as submitting the follow-up questionnaire within 135 days). The answers from baseline and follow-up were analysed in a second regression model to find any association with improvement according to the PGI-I. Factors in both models were then removed stepwise until only factors with significant association ($p \leq 0.05$) to the outcome remained. Age (categorized) was controlled for throughout the analysis.

RESULTS

In total, 13 257 people were included in the first analysis. Their mean age was 40.2 years (range 18 -98) and 690 used the English app. They had a mean ICIQ-UI SF score of 8.6 (SD 4.0). Of the total group, 1 861 (14.0 %) completed the 3 months of self-management. Only 1 610 participants were included in the second analysis because 251 people had an older version of the app in which the PGI-I questionnaire was not included. Due to the construction of the electronic questionnaire there were no missing answers for any of the other variables.

Four factors showed significant association with completing treatment: age, university education, episodes of stress incontinence and use of the English app (table 1). Together, these variables accounted for 2.7% (Nagelkerke R square) of the variability.

At follow-up, 1 094 participants (68%) reported improvement. Four factors were significantly associated with improvement: episodes of stress urinary incontinence, use of the English app, and higher frequency both of PFMT and of app use (table 1). These factors explained 23.2% of the variability (Nagelkerke R square).

INTERPRETATION OF RESULTS

Episodes of stress urinary incontinence and English app language were factors associated with both completion of self-management and improvement. Previous research has also shown a better effect of PFMT among women with stress urinary incontinence compared to other types of urinary incontinence. Additionally, the app was designed for women with stress urinary incontinence. The incongruent association of the app language could be due to the relatively few English users and that the app was developed to correspond to Swedish conditions.

Educational level predicted completion of self-management but not improvement. This could be a reflection of the association between educational level and the adoption of health apps (3).

Higher frequency of PFMT and use of the app were both associated with improvement, and the effect was not only associated to the amount of training. It is possible that the graphic support improved the quality of the training. The app also included information on incontinence, the pelvic floor and lifestyle advice that could explain this additive effect.

CONCLUDING MESSAGE

Since background factors only accounted for a small part of the variability, these results cannot support a recommendation of self-management for certain patient groups. More research is needed to evaluate whether other factors could better predict completion of self-management.

These results suggest that the app works better for the intended group with stress urinary incontinence. The inconsistent association of app language indicates a need for more research to evaluate the app in different cultural contexts. Further, the results support the recommendation of doing regular PFMT, but also indicate that using the app has other advantages than merely increasing adherence to PFMT.

FIGURE 1

Table 1. Factors associated with completion and improvement

	Completion	Improvement
	N=13 256	N=1610
Factors (reference)	**Adjusted OR (CI)***	**Adjusted OR (CI)***
Age (<30 years)		
30 - 39 years	1.67 (1.43 - 1.95)	NS
40 - 49 years	1.28 (1.07 - 1.52)	
≥50 years	1.24 (1.04 - 1.48)	
Education (No higher education)		
University	1.78 (1.57 - 2.01)	NS
Type of incontinence (No leakage upon exertion)		
Leakage upon exertion	1.16 (1.01 - 1.34)	1.50 (1.09 - 2.07)
Language (Swedish)		
English	0.57 (0.44 - 0.74)	4.16 (1.88 - 9.18)
Pelvic floor muscle training (<1/week)		
1 - 6 times/week	NA	1.91 (1.44 - 2.55)
Daily		1.75 (1.24 - 2.47)
Usage of app (About once per month or less often)		
About once per week	NA	3.41 (2.43 - 4.78)
Daily		7.55 (5.38 - 10.60)

*Results from the multivariate logistic regression model, adjusted for age.

OR: odds ratio, CI: confidence interval, NA: not applicable, NS: not significant

REFERENCES

1. Asklund I, Nyström E, Sjöström M, Umefjord G, Stenlund H, Samuelsson E. Mobile app for treatment of stress urinary incontinence: A randomized controlled trial. Neurourol Urodyn. 2017;36(5):1369-76.
2. Sjöström M, Lindholm L, Samuelsson E. Mobile App for Treatment of Stress Urinary Incontinence: A Cost-Effectiveness Analysis. J Med Internet Res. 2017;19(5):e154.
3. Carroll JK, Moorhead A, Bond R, LeBlanc WG, Petrella RJ, Fiscella K. Who Uses Mobile Phone Health Apps and Does Use Matter? A Secondary Data Analytics Approach. J Med Internet Res. 2017;19(4):e125.

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EVALUATION OF PELVIC FLOOR MUSCLES TRAINING WITH GAMETHERAPY IN THE QUALITY OF LIFE OF PATIENTS WITH MIXED URINARY INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

Training for pelvic floor muscles (TPFM) presents level 1 and degree of evidence A for the treatment of urinary incontinence (UI) [1]. Currently, a new therapeutic approach has been used, gametherapy. However, there are still few publications about this new modality for UI treatments [2]. It is important to emphasize that the presence of urinary symptoms can strongly affect patients' quality of life (QoL), causing physical, social, occupational and sexual limitations [3]. Therefore, the objective of this study was to compare the impact of UI on QoL and urinary loss before and after a TPFM by gametherapy in women with mixed urinary incontinence (MUI) .

STUDY DESIGN, MATERIALS AND METHODS

A single blind clinical trial. Participated in the study 16 women aged 45 to 70 years with diagnosis of MUI. Socio-demographic data, urogynecological, obstetrical and sexual history, as well as physical examination (height and weight) were collected through an evaluation form. Patients were evaluated before and eight weeks later on the impact of UI on QoL the International Consultation on Incontinence Questionnaire - Short Form (ICIQ-SF), on urinary losses through one-hour pad test and the evaluation of the intervention (PGI-I). During the eight weeks the volunteers underwent gametherapy training of the pelvic floor musculature. The training protocol was carried out through the the Nintendo® brand video game called Wii® using the Wii Fit Plus® game, being composed of a warm-up and exercises that involved general pelvic movements, such as retroversion movements, anteversion, lateral-lateral inclination and circumference. The games used were: Lotus Focus, Peguin Slide, Step Basic and HulaHoop. During the training there were progressions, in the first two weeks 2 sets of 8 repetitions were performed for each game and in the third and fourth week were performed 3 sets of 8 repetitions, the rest time between games was 1 minute. The training was conducted on an individual basis and the participants received an educational content throughout the sessions, with information about the location and function of the AP, types of UI, bladder and bowel functioning, as well as guidelines on risk factors. The training lasted 40 minutes. The descriptive statistics and the paired Student T test were used in the analysis of the data. The analysis of PGI-I was given by percentage.

RESULTS

The mean age of the sample was 54.43 (± 9.96), the majority had more than eight years of schooling (68,8%), had children (100%), had unregulated menstrual cycles (68,7%) and were

sexually active (56,3%). There was a statistically significant difference at the end of the intervention in the two analyzed variables: ICIQ-SF (p = 0.000) and one-hour pad test (p = 0.000). Regarding PGI-I, 81.3% of the volunteers reported being "much better or better" at the end of the training.

INTERPRETATION OF RESULTS

In the assessment of the impact of UI on QoL, it was observed that after the intervention there was a reduction of 92.36% in ICIQ-SF. The result showed that training with game therapy was able to reduce the ICIQ-SF final score by 7 points. A study [4] evaluated 214 women with SUI, before and after training to strengthen the PFM, and found 2.5 as the minimum clinically relevant difference in the total ICIQ-SF score. After the intervention we noticed that there was a 78.01% decrease in urinary losses. It is important to notice that all the volunteers at the end of the training obtained a final mean of urinary losses of less than 1 g, which according to ICS, is considered as continent. The use of the 1-h pad test proves to be a simple, practical and quick way of measuring urinary loss, and can effectively evaluate the outcome of an intervention [5]. Women treated with any type of training for PFM are more likely to report cure or improvement of symptoms, to report better QoL, to present fewer episodes of urinary loss per day, and less urine loss based on one-hour pad test [6]. This information corroborates the findings of our research.

CONCLUDING MESSAGE

Statistically significant differences were found in the results of the analyzed variables. Thus, the intervention with gametherapy was effective in improving /curing MUI, as well as improving QoL and urinary losses. Besides the scientific aspect, the result of this study also presents a positive social impact, since the patients with MUI can benefit from the proposed intervention.

FIGURE 1

Table 1 - Evaluation of urinary loss before and after eight weeks of pelvic floor muscle training with game therapy

	Before	After	P-Value*
1-h *Pad-Test* (g)	2.32 ± 1.18	0.51 ± 0.31	0.000*
ICIQ-SF	15.62 ± 3.34	8.12 ± 7.47	0.000*

ICIQ-SF - *International Consultation on Incontinence Questionnaire - Short Form.* * P-Value – significant for paired Student T test

REFERENCES

1. Nystrom E, Sjostrom M, Stenlund H SE. ICIQ symptom and quality of life instruments measure clinically relevant improvements in women with stress urinary incontinence. Neurourol Urodyn. 2015;34:747–51.
2. Dumoulin C, Hay-Smith EJC MH-SG. Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women (Review). Cochrane Database Syst Rev. 2014;(5):Art. No.: CD005654.
3. Goode PS, Burgio KL, Richter HE MA. Incontinence in older woman. JAMA. 2010;303(21):2172–81.

Funding CAPES **Clinical Trial** Yes **Registration Number** U1111-1179-5886 **RCT** No **Subjects** Human **Ethics Committee** Universidade do Rio Grande do Norte **Helsinki** Yes **Informed Consent** Yes

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SELF-MANAGEMENT OF ANAL INCONTINENCE AND INTEREST IN A SUPPORTIVE M-HEALTH APP AMONG WOMEN

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HYPOTHESIS / AIMS OF STUDY

The study aims were to describe self-management of anal incontinence (AI), referred to as accidental bowel leakage for study participants, and explore interest in the use of a mobile health application (mHealth app) for supporting AI self-management among community-living women.

STUDY DESIGN, MATERIALS AND METHODS

The study had an observational/descriptive design. Women (18+ years) diagnosed with AI who were patients seen in a urogynecology practice within the past 6 years were identified from administrative records. The women were mailed a cover letter explaining the study and elements of informed consent and a survey containing 8 multiple-choice questions and an open-ended prompt for comments. There were 4 questions about AI self-management, 2 questions about interest in an mHealth app to support AI self-management if one were created, 1 question about use of other mHealth apps, and 1 question about the patient's age group. Two sets of mailings were sent: the first went to 300 patients from the past two years, and the second mailing went to 575 patients from the past 3 to 6 years. Patients completed the survey anonymously and returned it to the investigators by mail. Descriptive statistics and graphical representations were used to summarize and analyze collected data.

RESULTS

Survey responses were received from 161 women (18% response rate). The greatest percentage of participants were aged 61-70 years (39%) followed by 71-80 years (29%), 51-60 years (18%), > 80 years (8%), 41-50 years (4%), and 18-30 years (1%). Data of the two youngest age groups were analyzed together due to their small percentages. Before seeking care from a clinician, the majority of participants had been trying to manage their AI for years (60%) or months (19%).

Regarding self-management of AI, nearly half of the participants (47%) "did not know anything," and 30% "knew

a little" about self-management before visiting a clinician. Only 4% "knew a lot" while 20% "knew some things" regarding AI self-management. Of those who have been trying to self-manage their AI (n=132), 37% of participants reported that it was not effective, and 39% reported it was "a little effective". Only 5% thought their self-management of AI was "very effective" while 19% thought it was "somewhat effective".

Regarding interest in using an mHealth app to help with the management plan for AI recommended by their clinician, half (50%) of the participants indicated they had "a lot of" interest in an mHealth app, 30% had "some" interest, 12% had "a little" interest, and 9% had "no" interest. When the women were asked if they would use an mHealth app for self-managing AI before contacting a clinician about the problem, the same percentage (27%) indicated that they would be "very likely" or "not likely" to do so; 14% and 20% of participants said that they would be "somewhat likely" or "likely" to do so, respectively. The vast majority of participants (89%) thought that it was "very important" to have guidance and support for managing AI.

Figure 1 shows the level of interest in using an mHealh app to support self-management of AI by age group. All age groups had "some interest", and interest was highest in those 71-80 years old. More than a third of participants currently use or had used some type of health-related mobile app (38%, n=58). Among these participants, 84% had "a lot" or "some interest" in using an app supporting AI self-management, and 16% had "a little" or "no" interest. The importance of having guidance/support for managing AI by various levels of knowledge and effectiveness of self-management efforts is shown in Figure 2.

INTERPRETATION OF RESULTS

Most women with AI lacked knowledge about AI self-management before visiting a clinician, and self-management efforts were only somewhat effective. Women tried to self-manage AI and waited before consulting a clinician about the problem. Women with AI highly valued guidance and support to assist them in managing their condition regardless of their level of knowledge or effectiveness of self-management. There was good interest especially among middle-aged and older women in using an mHealth app to support AI self-management if one were created. Some women would prefer to use such an app in collaboration with a clinician while others would try it on their own before visiting one. Women who previously used other mHealth apps were more interested in using an app about AI self-management if one were developed than women who had not used apps.

CONCLUDING MESSAGE

AI conservative management relies on a plan developed by a knowledgeable clinician and patient and patient self-management. There are currently few resources to assist with AI self-management. mHealth apps have assisted patients manage a variety of health conditions [1], including urinary incontinence [2], and have potential to assist with AI management. Findings show there is interest among women in an mHealth app supporting self-management of AI and encourage its development.

FIGURE 1

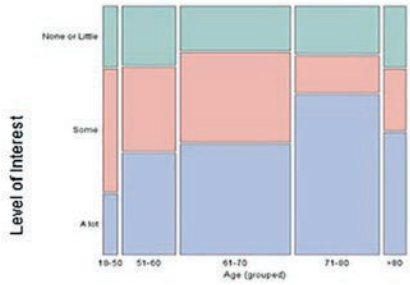

Figure 1. Interest in an mHealth App to Support Self-Management of AI by Age Group of Survey Participants

FIGURE 2

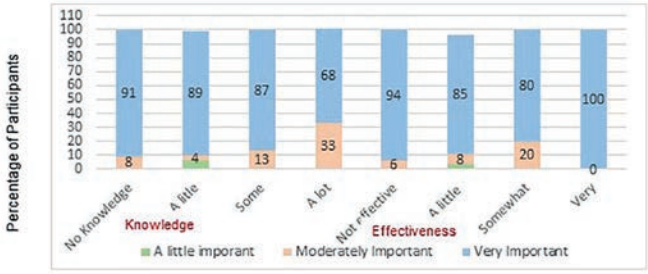

Figure 2.Importance of Support for Self-Managing AI by Level of Knowledge and Effectiveness of Self-Management

REFERENCES

1. Whitehead L, Seaton P. The effectiveness of self-management mobile phone and tablet apps in long-term condition management: A systematic review. J Med Internet Res. 2016;18(5):e97.
2. Asklund I, Nystrom E, Sjostrom M, et al. Mobile app for treatment of stress urinary incontinence: A randomized controlled trial. Neurourol Urodynam. 2017;36:1369-76.

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THE EFFECTS OF THE ADDITION OF A NEW PORTABLE PERINEOMETER (KEGELQ) ON STRESS URINARY INCONTINENCE DURING PELVIC FLOOR MUSCLE EXERCISE IN WOMEN: A MULTICENTER, PROSPECTIVE RANDOMIZED, CONTROLLED TRIAL

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HYPOTHESIS / AIMS OF STUDY

Various adjunctive methods, especially biofeedback, have been applied to improve the outcomes of pelvic floor muscle exercise (PFME) in the treatment of stress urinary incontinence (SUI). Biofeedback is intended to perceive the proper PFM and to enhance training performance more efficiently by direct audiovisual stimuli. However, there have been controversies on the apparent effects of the combined biofeedback to PFME and this might be because previous studies had some methodologic drawbacks, such as differences in the PFME programs between groups and lack of treatment compliance or third-party assessment, and used various different devices. A recently developed portable perineometer (KegelQ) device has several characteristics different from existing ones. The silicone probe can expand evenly, not ovally in shape, enabling the patient to perform the exercise effectively no matter how deeply the probe is positioned in the vagina cavity, and the feedback can be provided more effectively by the actual pressure value (mmHg) and the change of the monitor color in addition to the graph (Fig. 1). We aimed to determine the effects of the addition of this new device to PFME on female SUI and feasibility of the clinical use.

STUDY DESIGN, MATERIALS AND METHODS

From May 2016 to July 2017, 90 eligible women aged between 20 and 80 years with SUI symptoms for more than 3 months were randomly assigned to receive PFME, either alone (PFME only group, N = 45) or combined with KegelQ biofeedback (Biofeedback with KegelQ group, N = 45), in three teaching hospitals. All women showed the positive response on the Sandvik questionnaire item inquiring the presence of SUI symptoms during a recent week and had 2gm or more of urine leakage on 1-hr pad test at enrollment. After an explanation about the PFM anatomy and function, one physiotherapist per hospital, who had received training for standardization of PFME, taught participants to contract the PFM properly and assessed this by vaginal palpation. Then, participants were taught a predefined 12 week-exercise protocol, which consisted of repetitions of fast and sustained contractions for 9 minutes, to perform twice daily at home. In the Biofeedback group, participants were instructed to perform PFME with the KegelQ device in accordance with the same protocol embedded in the device. During study period, a physiotherapist contacted participants four times for monitoring treatment compliance and re-education of exercise, if needed. The primary outcome measure was an objective cure rate at 12 weeks, defined as less than 2gm of urine leakage on 1-hr pad test. Quality of life (QOL) and other measures of symptom severity at 12 weeks were evaluated as the secondary outcomes. The outcomes were measured by third parties who were blinded to group allocation and treatment sequence.

RESULTS

There were no significant differences in the clinicodemographic characteristics between both groups at baseline. Among 90 participants, 76 women completed the study (PFME only group 38, Biofeedback group 38). During the follow-up, the compliance of PFME at home was 76.5% and 73.2% in both groups. Within-group analyses demonstrated that both treatments significantly enhanced the status of urinary continence compared to the baseline except Sandvik frequency and severity index in the PFME only group. In the comparison of both groups, the objective cure rate at 12 weeks was 48.9% and 64.4% in the PFME only and Biofeedback group, respectively, but this was not significantly different ($p = 0.136$). Among the secondary outcomes, I-QOL score, PPBC score, Sandvik frequency and severity index, and changes of 1hr pad amount improved significantly more in the Biofeedback group compared to the PFME only group (Table 1). The strengths of the PFM at 4 & 12 weeks were also increased more in the Biofeedback group compared to the PFME only group. While patient age and baseline 1hr pad amount were related to the objective cure, the addition of a new device (OR 5.9, 95% CI 1.93-18.29) was the predictive factor for the meaningful improvement of total I-QOL score (≥6) at 12 weeks. Visual Analog Scale (0-10) on the inconvenience during the use of KegelQ was 1.8 (±1.8) and there were no reported adverse events related with the treatment in both groups.

INTERPRETATION OF RESULTS

In the present multicenter randomized trial, both 12 week-PFME with and without biofeedback using KegelQ device were effective for SUI symptoms and the objective cure rates at 12 weeks were not statistically different between groups. However, QOL and other measures of SUI symptom severity were significantly more enhanced in women with the use of a new device. These improvements may be derived from the degree of improvement of the strength of the PFM. A new device, the KegelQ, can be used as a useful adjunctive treatment to PFME.

CONCLUDING MESSAGE

Although the addition of the KegelQ device did not statistically improve the objective cure rate compared to PFME alone, QOL and other measures of SUI symptom severity were significantly more enhanced with the use of the KegelQ device. It may be used daily at home as a useful adjunctive treatment to PFME.

FIGURE 1

Fig. 1. The probe design and monitor display of the KegelQ device

FIGURE 2

		PFME only (n=45)	Biofeedback with KegelQ (n=45)	p
[Primary outcome]				
Cure rate at 12W (n)		48.9% (22)	64.4% (29)	0.136
[Secondary outcomes]				
I-QOL at 12W	Avoidance/limiting behavior	68.7±20.7	76.3±17.7	0.065
	Psychosocial impact	69.6±22.9	78.3±19.2	0.053
	Social embarrassment	63.0±23.0	74.9±15.6	0.005
	Total score	67.5±21.9	76.7±16.5	0.026
SANDVIK frequency index at 12W	≥1 in a week + daily (%)	31 (68.9)	21 (46.7)	0.033
SANDVIK severity index at 12W	Moderate + severe (%)	13 (28.9)	4 (8.9)	0.015
PPBC at 12W		3.3±1.2	2.8±1.1	0.041
Change of 1hr-pad amount (g)	Baseline - 12W	4.3±8.6	8.6±10.7	0.038
PFM strength (mmHg)	at 4W	16.3±7.7	22.0±11.0	0.006
	at 12W	18.1±10.6	25.2±10.7	0.002

Table 1. Intergroup analyses of the primary and secondary outcomes

Funding Korea Health Industry Development Institute **Clinical Trial** Yes **Public Registry** No **RCT** Yes **Subjects** Human **Ethics Committee** The Institutional Review Board of Seoul National University Bundang Hospital **Helsinki** Yes **Informed Consent** Yes

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THE USE OF MOBILE HEALTH TECHNOLOGY TO SUPPORT POST-PARTUM PELVIC HEALTH: A RANDOMIZED MIXED METHODS PILOT STUDY

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HYPOTHESIS / AIMS OF STUDY

Pelvic floor muscle exercises commened in the post-partum period have clearly established efficacy(1-2). The popularity of mobile health (mHealth) devices affirms their perceived utility among the public. Claims of mHealth technologies supporting pelvic floor health and fitness have not routinely been substantiated with systematic inquiry (3). The specific aims of this study were three fold:

1.) Is the mHealth techology a feasible intervention to support pelvic floor health in the post-partum period?

2.) Is the mHealth technology an acceptable intervention to support pelvic floor health in the post-partum period?

3.) Is the mHealth technology effective in supporting pelvic floor health in the post-partum period?

STUDY DESIGN, MATERIALS AND METHODS

A blinded, randomized, mixed methods study was conducted to evaluate a 16-week intervention. Quantitative measurements included the Incontinence Impact Questionnaire (IIQ-7) scores, Urogenital Distress Inventory (UDI-6) and PERFECT pelvic exam. Interpretive description methodology, using one-to-one interviews determined factors influencing acceptability and feasibility.

RESULTS

A total 23 women with a mean age of 32.2 years were randomized to the mHealth device (n=13) or control (n-10) groups. Both groups improved on quantitative measures but only the UDI-6 showed statistical significance in both groups. There were no statistical differences between groups in any quantitative measure. Most participants (72.7%) indicated value in the concept of the mHealth device, technical difficulties (72.7%), a cumbersome process to set up the software (63.6%) and discomfort of the device (63.6%) impeded the device's acceptability. The assessment and instruction received at the onset of the study was identified as more useful than the mHealth device (72.7%). This utility was affirmed by all control subjects.

INTERPRETATION OF RESULTS

The mHealth solution studied did demonstrate improvement in outcomes when compared to standard care in the population of post-partum women in this study. Notably, standard care consistent of a standardized pelvic floor exam inclusive of instruction of correct basic pelvic floor exer-

cises. Considering the collective results (quantitative and qualitative) pointing to the value of this standard care. Although the concept of the mHealth solution was perceived as valuable the issues related to the operationalization of the mHealth device studied, did not translate to overall acceptability or feasibility.

CONCLUDING MESSAGE

The mHealth solution studied was not found to be acceptable, feasible or superior to a standard care protocol for post-partum women.

FIGURE 1

Perspective	Agreement (%)	Supporting Quotes
The concept of a device to help rehabilitation your pelvic floor through biofeedback is good	72.7	"As a busy mom I find I am too busy to be going to appointments so this allowed me to get the help I needed without going to appointments" (1001)
The biofeedback was helpful.	27.3	"When it was working it was helpful to have the feedback; I liked knowing how the pelvic floor was working" (1023).
The biofeedback was not helpful (inconsistent/inaccurate)	63.6	"I was trying to squeeze as hard as I could and it just was not registering (1017).
Tracking my progress was a helpful feature	18.1	"Seeing your score and being able to keep track of your score so that you were working towards something was motivating. The other part was being able to see other peoples scores, that helped to give you a sense of where you ranked in comparison to other people. That was motivating too or at least made it more enticing to want to play more" (1013).
Tracking my progress was not helpful (inconsistent/inaccurate)	54.5	"I did find out that the results were not getting sent in for whatever reason so this was off putting and really made me not want to use it" (1011).
Instructions were easy to follow and the purpose clear	27.3	"It was pretty self-explanatory and I felt like the instructions I was given here at the beginning of the study were really clear and straight forward" (1001).
Instructions were not straight forward the purpose unclear	54.5	"It was a confusing because with the games there were no instructions, it took me multiple attempts to try to figure out what I was doing" (1005).
The device and app motivated me to do pelvic floor exercises (facilitator)	27.3	"I tried different games, the games were interesting they were like video games" (1010).
The device and app made it more difficult to do pelvic floor exercises (barrier)	63.6	"The hassle of using the whole device was an issue, it was not as easy as just doing the [pelvic floor] exercises "(1008).
Technical difficulties with the mHealth solution were an issue	72.7	"When I was trying to play the games I couldn't get any type of a score and it was frustrating because I didn't know if it was just a problem with the app or device or if I really was not getting any engagement of my pelvic floor" (1002).
The set up of the device and app was cumbersome (not "new mom" friendly)	63.6	"The fact that you have to set it up and lie down, get lubricant in order to use it – so set up and clean up doesn't mix well with the life of a busy mom who if constantly interrupted" (1015).
The device was comfortable	36.3	"I found it comfortable and relatively user-friendly" (1015).
The device was uncomfortable	63.6	"I really haven't been using it – because it is big and frankly the idea of inserting it is not appealing, it took me 10 minutes to insert it" (1012).
Optional positioning of the device was an issue.	36.3	"but knowing the position of it – sometimes I wasn't sure if it was inserted too deep or too superficial" (1005). "Also I did find slightly changing the position of the [device] really changed what the feedback indicated" (1023).
The mHelath solution was helpful when combined with a pelvic floor exam	27.3	"It is not useful to have this without having the assessment and some discussion with an expert" (1017).
Instruction from the practitioner was more helpful than feedback from the device and app.	72.2	"When I did the initial exam I found that really helpful here because I was never assessed like that before but I think I would have benefited from another appointment rather than just using the device" (1010).

REFERENCES

1. Dumoulin C, Hay-Smith EJC, Habée-Séguin GM. Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women. Cochrane Database of Systematic Reviews. 2014; Issue 5. Art. No.: CD005654. DOI: 10.1002/14651858.CD005654.pub3.
2. Dumoulin C, Hay-Smith J, Habée-Séguin GM, Mercier J. Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women: a short version Cochrane systematic review with meta-analysis. Neurourol Urodyn. 2015;34:300–308.
3. Melnyk BM. The role of technology in enhancing evidence-based practice, education, healthcare quality, and patient outcomes: a call for randomized controlled trials and comparative effectiveness research. Worldv Evid-Based Nu. 2012;9.2:63-65. DOI: 10.1111/j.1741-6787.2012.00245.x.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Hamilton Integrated Ethics Board **Helsinki** Yes **Informed Consent** Yes

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DEVELOPMENT AND USE OF AN ALGORITHM FOR IDENTIFYING WOMEN WITH URGENCY OR MIXED URINARY INCONTINENCE SUITABLE FOR E-HEALTH TREATMENT

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HYPOTHESIS / AIMS OF STUDY

One of the challenges in health care today is providing affordable care for those in need, and identifying a reasonable level of care for care-seekers. Many women with urinary incontinence might be reluctant to seek care for various reasons. Recent reviews propose lifestyle advice, pelvic floor muscle training (PFMT) and, in some cases, behavioural changes as first-line treatment for urgency (UUI) and mixed (MUI) urinary incontinence in women (1). Treatment via a smartphone app containing lifestyle advice and PFMT has been shown to be effective for, and appreciated by, women with stress urinary incontinence (SUI) (2). A smartphone app could also be a way to make treatment available to more women with UUI and MUI. The traditional recommendation of an extensive examination, on the other hand, has been described as a potential barrier to offering diagnosis and treatment to women with those conditions (3). The results of one study support the use of an algorithm combined with dipstick urinalysis for diagnosing women with urgency-predominant incontinence suitable for pharmacological treatment (3). The first aim of this study was to develop and use an extensive algorithm intended for women with UUI or MUI, to identify those with symptoms that would motivate a physical examination within usual care. The algorithm was intended for women interested in treatment via a smartphone app. To our knowledge, this is the first attempt to identify this target group in this way. The second aim was to estimate the proportion of the people interested that might be suitable for smartphone app treatment, based on the algorithm.

STUDY DESIGN, MATERIALS AND METHODS

This report is part of a larger RCT study aimed at evaluating smartphone app treatment for women with UUI and MUI. As part of the preparations for the RCT study, a team of experienced general practitioners (GP), a Specialist Continence nurse, a urologist and a urogynecologist together developed an algorithm with questions regarding symptoms for which an examination would be judged important within usual

care. The team included both researchers and clinicians. The RCT study was approved by a regional ethics board and registered in the Clinical Trials register. Recruitment was carried out via conventional methods (press releases, information to midwives, advertisements in media) as well as via Facebook advertisements. The advertisements directed interested people to the homepage of the research project, where additional information about the study and a link to a web-based screening questionnaire was provided. The screening questionnaire included questions on inclusion criteria and some background information, before presenting the questions related to the algorithm (figure 1). People who did not meet the inclusion criteria (woman, ≥18 years, ≥2 leakages/week, ≥12 month symptom duration, urgency or mixed urinary incontinence), or those who were pregnant or used another PFMT app or antimuscarinic drugs could not proceed further with the questionnaire. If a respondent gave a positive answer on any symptom from the algorithm, she was excluded and recommended to contact her normal health care provider for further assessment. Any respondent who passed the screening questionnaire in full was asked to provide her email address and thereafter received an informed consent form and a bladder diary to complete. Once these were returned, the respondent received another questionnaire and was thereafter contacted via telephone by a Specialist Continence nurse or GP. The purpose of this telephone interview was to give the diagnosis and to verify the answers to the algorithm questions.

RESULTS

Following a year of meetings and discussions in the research team, a final algorithm was decided via consensus, based on previous literature on the subject as well as clinical experience. The symptoms and conditions included in the algorithm were painful urges; pyelonephritis; three or more urinary tract infections (UTI) in the last 12 months; dysuria (burning upon urination); visible haematuria; non-investigated bladder emptying difficulties; metrorrhagia; cancer in the pelvic area, bladder or bowels; decreased mobility or sensibility in the legs or pelvic area; previous stroke; neurological disease and diabetes (figure 1). The algorithm was used in the web-based screening questionnaire as described above.

Out of 765 women with UUI or MUI with ≥2 leakages/week and ≥12 month duration, 523 were identified as eligible to be offered e-health treatment after exclusions. The 238 women who were excluded for symptoms in the algorithm were automatically advised to contact their normal health care provider for further assessment (figure 1). A further four women left the questionnaire before completion of all questions and were therefore not included.

Of the 523 eligible women, 142 women chose to complete all the successive steps and were interviewed via telephone. In the interviews, nine women presented algorithm-related symptoms. In five cases, those symptoms were neurological (i.e. a diffuse sense of numbness in regions of the lower limbs), one woman, aged 51, also had painful urges. Another woman, aged 45, had painful urges as her only symptom. One woman, aged 64, reported having recurring visible haematuria and dysuria three months prior to the interview and had earlier been examined with cystoscopy. Another woman, aged 70, had current dysuria and was being treated for a UTI. One woman had metrorrhagia and was being investigated in usual care. All of these cases were discussed with an experienced GP and/or urogynecologist and were excluded and redirected to their normal health care provider as an extra precaution.

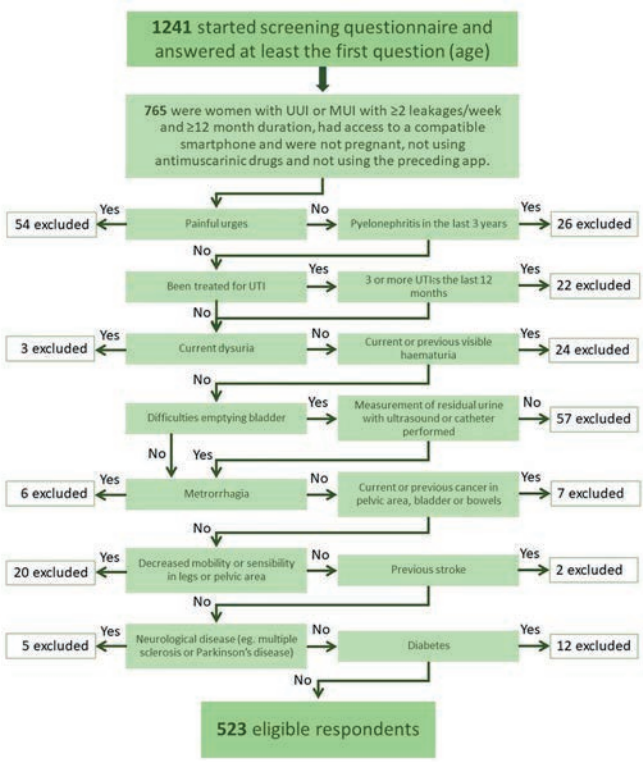
INTERPRETATION OF RESULTS

It is possible to develop an algorithm as described above via consensus within a team of experienced clinicians and researchers. Approximately two-thirds of women with UUI or MUI with ≥2 leakages/week and ≥12 month duration who are interested in an e-health intervention might be suited to this kind of treatment. An algorithm such as the one described here might be one way to identify suitable women and redirect those who should contact usual care for an assessment of specific symptoms. However, we do not know whether the respondents who were redirected to usual care had already been examined for these symptoms and/or had relevant underlying pathology. Nonetheless, our view was that the occurrence of any of the other symptoms should motivate precaution, and was a reason for the patient to contact their normal health care provider.

CONCLUDING MESSAGE

An algorithm such as the one described here might both help the patient (or health care personnel) to choose a reasonable level of care, and possibly also identify women who had not previously considered seeking care for certain symptoms. In the long term an algorithm might help lessen the burden of ordinary health care providers by directing interested and eligible women to suitable e-health options. We are currently evaluating the efficacy of an app treatment for women with UUI/MUI, both in the short and long term. The results will include information from registers regarding diagnosis and care for relevant conditions.

FIGURE 1



REFERENCES

1. Lukacz E, Santiago-Lastra Y, Albo M, Brubaker L. Urinary Incontinence in Women. JAMA. 2017;318(16):1592.
2. Asklund I, Nyström E, Sjöström M, Umefjord G, Stenlund H, Samuelsson E. Mobile app for treatment of stress urinary incontinence: A randomized controlled trial. Neurourology and Urodynamics. 2016;36(5):1369-1376.
3. Huang A, Hess R, Arya L, Richter H, Subak L, Bradley C et al. Pharmacologic treatment for urgency-predominant urinary incontinence in women diagnosed using a simplified algorithm: a randomized trial. American Journal of Obstetrics and Gynecology. 2012;206(5):444.e1-444.e11.

Funding The study was funded by Swedish Research Council for Health, Working and Welfare; The Kamprad Family Foundation; and the Region Jämtland Härjedalen **Clinical Trial** Yes **Registration Number Clinical Trial**s (ID NCT 03097549) **RCT** Yes **Subjects** Human **Ethics Committee** Regional Ethical Review Board, Umeå, Sweden **Helsinki** Yes **Informed Consent** Yes

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DIGITAL HEALTH - DOES A DIGITAL HOME BLADDER MONITORING DEVICE INCLUDING UROFLOWMETRY AND VOIDING DIARY IMPROVE PATIENT COMPLIANCE AND DATA ACCURACY? INITIAL FEASIBILITY PILOT STUDY

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HYPOTHESIS / AIMS OF STUDY

Uroflowmetry and a voiding diary are important diagnostic tools to assess urinary tract symptoms. In-clinic uroflowmetry is a one off sampling and may not reflect the patient's actual voiding patterns especially in children. Paper voiding-diaries are a burden, for patients and frequently associated with poor compliance. Failure to collect accurate data may lead to an inaccurate assessment and diagnosis resulting in negative experiences for the patients. iUFlow (fig. 1) is an easy to use home bladder-monitoring device, implemented on a mobile platform, allows every void at home to be a validated uroflowmetry and recorded in an electronic voiding diary. This study aims to assess the feasibility of using iUFlow in the pediatric population.

STUDY DESIGN, MATERIALS AND METHODS

24 patients were asked to complete a 3-day home bladder monitoring using iUFlow, followed by patient Satisfaction questionnaire. Additionally, in-office uroflowmetry data were compared to multiple iUFlow readings captured at home.

RESULTS

22/24 (92%) subjects fully completed 3-day monitoring. Mean participant age was 7.3 years (std. dev: 3.7). Mean uroflowmetry measurements collected per participant was 12.07 (std. dev: 7.84). The shape of the curves and Qmax generated by iUFlow corresponded with the in-office uroflowmetry measurement (fig. 2) and the voiding diaries were accurate and complete for each at home void. Nighty four percent of the patients had a positive experience using iUFlow device and the related app. A minority of only six percent of the patients reported a preference to use the conventional pen and paper bladder diary over a digital bladder diary, while 62.5% favor a digital bladder diary; 31.3% reported that both are fine.

INTERPRETATION OF RESULTS

The main clinical advantage of the iUFlow is increased patient compliance when completing a voiding diary, since the device is always there (day and night), there is no need for the patient to read or write the volume of urine, and therefore there is no missing data. The data thus betters reflects the patient's underlying symptoms. A logical explanation for the high compliance could be supported by the fact that the perceptions of the children upon completion of the fully au-

tomated voiding diary trial were positive. The iUFlow reported as a relatively easy to use for monitoring fluid intake and bladder events at home.

The home uroflowmetry data collected by iUFlow produces a picture of the children's bladder behavior in-vivo, in its normal condition of the child daily life.

Importantly, patients found to be ripped to digital health. When were asked: "Do you think that there is a benefit in sending the diary to the doctor prior to your next visit?" 93.8% responded overwhelmingly positively, suggesting openness for new technological innovations (while 7.2% reported `possibly` and none answered `definitely no`).

CONCLUDING MESSAGE

iUFlow is an easy to use, automated method for monitoring fluid intake and bladder events at home improving compliance and quality of data collected. iUFlow may enable better understanding of the overall behavior of the bladder in the child's comfortable home environment.

FIGURE 1

FIGURE 2

Funding Kesem provided the devices. Author is adviser to Board of company **Clinical Trial** Yes **Registration Number** Hadassa Hospital 20161678 **RCT** No **Subjects** Human **Ethics Committee** Hadassa Hospital **Ethics Committee Helsinki** Yes **Informed Consent** Yes

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IMPACT OF A PELVIC FLOOR MUSCLE TRAINING PROGRAM ON THE INTERNAL PUDENDAL ARTERY AND THE DORSAL CLITORAL ARTERY BLOOD FLOW IN WOMEN WITH GENITOURINARY SYNDROME OF MENOPAUSE

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HYPOTHESIS / AIMS OF STUDY

The genitourinary syndrome of menopause (GSM) is caused by the decrease in estrogen and other sex steroids, which lead to changes in estrogen-sensitive tissues, i.e. the labias, clitoris, introitus, vagina, urethra and bladder. One of these changes is the reduction of blood flow in the tissues, causing a reduction of vaginal discharge and vaginal lubrication.

It is well known that aging and chronic hormonal depletion cause changes in the skeletal arteries in postmenopausal women, such as a reduction of their size and elasticity, which leads to a reduction in the blood flow. In this population, a muscle training program was shown to improve the blood flow in specifically trained skeletal muscles [1,2]. Since the arteries irrigating the pelvic floor muscles (PFM) also supply the vulvo-vaginal tissues, PFM training could improve vulvo-vaginal blood flow. The positive effect of a PFM training program on GSM symptoms was observed in a previous case study [3]. However, the impact of such a program on the vulvo-vaginal blood flow has not been investigated to date.

The internal pudendal artery (IPA) is one of the main vessels irrigating both the vulvo-vaginal tissues and the PFM. Assessment of its blood flow with color Doppler ultrasound has been described before, proximally at the level of the ischial spine and, more distally, at the level of its terminal branch, the dorsal clitoral artery. Moreover, repeatability of these measurements has been demonstrated previously by our research team in young women and in women with GSM. Assessing IPA blood flow and the clitoral blood flow before and after a PFM training program could yield information about the impact of this intervention on vulvo-vaginal blood flow.

The purpose of this study, therefore, was to assess the impact of a PFM training program on the IPA and the dorsal clitoral artery blood flow in postmenopausal women with GSM.

STUDY DESIGN, MATERIALS AND METHODS

This prospective interventional cohort study included postmenopausal women aged 55 or over with GSM. The diagnosis of GSM was confirmed by a collaborating gynecologist. Exclusion criteria were pathology, previous treatment or medication likely to interfere with blood flow measurements such as dermatological diseases of the vulva, previous radiotherapy for gynecological cancer and antiestrogenic medication. The dosage of hormonal therapy or arterial hypertension medication had to be stable for at least six months before participation in this study to ensure perineal blood flow stability. Each woman participated in two pre-intervention evaluations (PRE1 and PRE2), a 12-week PFM training program and a post-intervention evaluation (POST). PRE2 was conducted two weeks after PRE1 to document stability of blood flow measurements among the participants. All blood flow evaluations were performed by the same observer. Caffeine and tobacco intake, sexual activity, physical activity as well as use of creams or other product applications in the vulvar and gluteal areas were controlled for a period of 24 hours before the assessment as these have been shown to influence IPA and dorsal clitoral artery blood flow parameters.

For the IPA blood flow measurements, participants were asked to rest in the prone position for 15 minutes to ensure standardized conditions. Using a clinical ultrasound system (Voluson E8, GE healthcare), three measurements of the IPA blood flow were taken with a 2-7 MHz curved-array probe at the level of the ischial spine on the participant's right gluteal area. Participants then had to rest for an additional 15 minutes in the supine position for assessment of the clitoral blood flow. With a 4-13 MHz linear probe on the clitoris, measurements were taken again three times. Each time, the peak systolic velocity, time-averaged maximum velocity and pulsatility index were collected. The clearest waveform in a pulsed-wave Doppler recording was selected for analysis.

The 12-week training program included a weekly one-hour PFM training intervention with an experienced physiotherapist and daily home-based progressive PFM exercises.

Paired-samples t-tests were used to assess 1) blood flow stability between PRE1 and PRE2 and 2) blood flow differences between pre-intervention measurements (mean of PRE1 and PRE2) and post-intervention measurements (POST).

RESULTS

Thirty-one women with a mean age of 68.0 ± 6.6 and mean parity of 1.8 ± 1.1 were recruited. Among the participants, 20 were sexually active (with intercourse), 12 were taking local hormonal therapy and two were taking systemic hormonal therapy. No change of dosage or use of HT during the study was reported. Three participants dropped out of the study for personal reasons (time constraint).

Pre-intervention measurements stability:

There was no significant difference between PRE1 and PRE2 for all parameter measurements for both arteries (IPA and dorsal clitoral artery) (p> 0.05).

Impact of intervention on blood flow measurements:

For the IPA blood flow, the peak systolic velocity parameter increased (p=0.031) after the 12-week PFM training program. There was no significant difference for the time-averaged maximum velocity and pulsatility index parameters.

For the dorsal clitoral artery blood flow, the peak systolic velocity parameter also increased (p=0.040) after the 12-week PFM training program. There was no statistically significant change in the time-averaged maximum velocity and pulsatility index parameters.

INTERPRETATION OF RESULTS

To our knowledge, this is the first study to assess the impact of a PFM training program on the IPA and the dorsal clitoral artery blood flow. In women with GSM, an improvement in the peak systolic velocity of the blood flow in both arteries was found after the PFM training intervention. Those encouraging results suggest an improvement in IPA vascularization, up to its terminal branches (the clitoral artery), potentially affecting the capillary density in the tissues irrigated by the IPA, which include the PFM, the vagina, the labias and the clitoris.

Similar to our study findings, other studies in postmenopausal women have shown blood flow improvement after a muscle training program. These improvements were found locally, in the velocity parameter of the femoral artery blood flow [1] and more distally, in the capillary density of the quadriceps [2].

CONCLUDING MESSAGE

Our research findings are original as they suggest that a PFM training program improves IPA blood flow and clitoral blood flow in women with GSM. Further studies are needed to confirm these results in an RCT.

FIGURE 1

Table 1. Assessment of the blood flow of the internal pudendal artery

Artery	Blood flow parameters	Mean of PRE1 and PRE2	Post-treatment	p value
Internal pudendal artery	Peak systolic velocity (cm/s)	43.2 ± 8.9	48.6 ± 11.8	0.031*
	Time-averaged maximum velocity (cm/s)	8.1 ± 3.1	8.6 ± 4.3	0.528
	Pulsatility index	5.8 ± 1.5	6.5 ± 2.1	0.142
Dorsal clitoral artery	Peak systolic velocity (cm/s)	5.2 ± 1.0	6.0 ± 2.1	0.040*
	Time-averaged maximum velocity (cm/s)	1.5 ± 0.8	1.6 ± 1.0	0.418
	Pulsatility index	4.3 ± 1.3	4.2 ± 1.7	0.840

*Statistically significant (p<0.05)

REFERENCES

1. Nyberg, M., Egelund, J., Mandrup, C. M., Andersen, C. B., Hansen, K. M. B. E., Hergel, I.-M. F., Valbak-Andersen, N., Frikke-Schmidt, R., Stallknecht, B., Bangsbo, J. and Hellsten, Y. (2017), Leg vascular and skeletal muscle mitochondrial adaptations to aerobic high-intensity exer-

cise training are enhanced in the early postmenopausal phase. J Physiol, 595: 2969–2983. doi:10.1113/JP273871
2. Gavin, T.P., et al., Aging and the Skeletal Muscle Angiogenic Response to Exercise in Women. The Journals of Gerontology Series A: Biological Sciences and Medical Sciences, 2015. 70(10): p. 1189-1197.
3. Mercier, J., et al., Pelvic floor muscles training to reduce symptoms and signs of vulvovaginal atrophy: a case study. Menopause (New York, NY), 2016

Funding Fonds de recherche en Santé du Québec, Quebec Network for Research on Aging, Ordre professionnel de la physiothérapie du Québec **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Institutional Review Board of the Institut universitaire de gériatrie de Montréal (Montreal, Canada) **Helsinki** Yes **Informed Consent** Yes

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BEYOND THE TRAINING: THE BENEFITS OF PEER SUPPORT AND IMPROVED SELF-PERCEPTIONS EXPERIENCED BY WOMEN COMPLETING A 12 WEEK PFM TRAINING PROGRAM

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HYPOTHESIS / AIMS OF STUDY

Urinary incontinence (UI) is an important medical condition affecting as many as 55% of women living in the community. Adding to the physical discomfort of urine leakage, UI can have detrimental impacts on overall quality of life, namely impacting daily activities, social participation, physical activity, functional independence and threatening a healthy self-identity [1].

The internalization of prejudicial attitudes (self-stigma) towards UI can negatively impact self-perceptions as well as help-seeking of women living with this condition [2]. Few studies have explored the potential benefits of Pelvic Floor Muscle (PFM) training program with respects to the women's experiences, self-perceptions and how they perceive self-management of UI after this intervention. .

This study aims to better understand the lived experience of women who completed a PFM training program with a focus on how peer support affect self-perceptions and self-management of UI throughout a PFM training program and how this relates to their quality of life. To our knowledge, this is the first study that explores the mechanisms of change in self-perceptions and self-management in relation to peer support within a PFM training program. A better understanding of these mechanisms from the perspective of the individual with UI can inform and maximize the health benefits of PFM training programs.

STUDY DESIGN, MATERIALS AND METHODS

Qualitative research allows to draw descriptive accounts of lived experience and knowledge. Hence, 17 semi-structured qualitative individual interviews were conducted with a sub-sample of participants of a non-inferiority RCT comparing two PFM training programs for UI.

To participate in the study, women had to be aged 60 years or more, report symptoms of stress or mixed UI, have completed the 12-week PFM training program and provide informed consent to participate in an individual face-to-face interview. Women were excluded from the study if they presented cognitive or communication difficulties that would hinder the interviewing process.

The PFM training program consisted of 12 weekly 60-minute sessions provided by an experienced physiotherapist. Sessions consisted of 10 minutes of psychoeducation, 30 minutes of PFM training in static positions (lying, sitting, four-point kneeing and standing) and 20 minutes of dynamic PFM training. The program also included an at-home PFM training program to be completed 5 days a week. The PFM training program included both an individualized (physiotherapist only) and a group-based condition (physiotherapist and a group of women with UI). The presented data includes both program conditions, discussing them separately and as a whole.

A trained interviewer with knowledge of UI conducted the interviews from June 2016 to August 2017, meeting participants at the training location following their program completion. The semi-structured interviews included open-ended questions about perceived changes as a result of their participation in the program. All participants were questioned about the format of presentation to gain an understanding of experiences in group or individual condition training. Interviews were audio-recorded and transcribed verbatim. Interview transcripts were analyzed using content analysis [3]. Three experienced coders including the interviewer individually coded and then together discussed transcripts one by one. They then met to analyze latent themes emerging from the interview corpus.

RESULTS

Interview participants were aged 60 to 78 (M=67.7 5.45 years) and had been living with stress or mixed UI for between 1 and 36 years (M=10.2 11.35 years). Of these, 8 women were in the group-based program, the other 7 women were in the individualized program.

Our analyses of interviews revealed that women having completed the PFM training program described peer support as that provided by other women living with the condition, but also family members (sisters/life partners) and professionals (physiotherapist/research team). Thus, in this study peer support is defined as support provided by any of these three sources. Furthermore, our analyses uncovered four inter-related themes that describe how peer support influences self-perceptions and self-management of a sample of older women who have completed individualized or group-based PFM training programs. These four themes were: 1) Point of entry; 2) Safe space; 3) From concealing to disclosing and 4) Change in perspective.

INTERPRETATION OF RESULTS

1) Point of Entry: This theme describes the extent to which peer and professional support influenced self-perceptions and self-management of UI was dependent on each participant's starting point. Point of entry represented participants' unique characteristics and manifestations of UI. This included but was not limited to perceived cause of UI, perceived severity of UI, fluctuations in symptomology, rate of progression, as well as secondary health conditions presently being managed. Point of entry was also reflected by participants' state of mind, emotions and beliefs concerning UI management.

2) Safe space: In this theme, participants described their social interactions that occurred within the context of the training program RCT as being protected from potentially stigmatizing attitudes from others. The safe space was characterized as an environment where there were fewer and less intense threats from others in their social environment. Feeling safe, secure, self-assured and protected came about primarily because of the UI knowledge of others present. Participants in both the individualized and the group-based conditions suggested that the professional knowledge of the physiotherapist contributed to creating a protected space. For participants in the group-based condition the experiential knowledge of UI of the other participants also contributed. In both conditions, the complete absence of others who have little or no knowledge of UI and are therefore more likely to judge was beneficial in creating a safe space.

3) Conceal to disclose: This theme represents a shift in participant attitudes as well as behavior from concealing UI from others to being ready to disclose to others during the PFM training. This change was attributed to interacting with knowledgeable others, as well as implementing coping strategies learned in the training program. Over time, participants became more open to disclosing information about their condition to others.

4) Change in perspective: This theme represented participant shift toward: A) a more positive self-image; and B) perceived control of their UI in social settings. Through their involvement in the training program, participants learned about UI and its management, and became more willing to acknowledge to others information about their health status.

CONCLUDING MESSAGE

Study findings map a path of change in self-perceptions and self-management of UI for women having completed either an individualized or a group-based PFM training program. The safe space of the training program allowed women to benefit from peer support and encouraged them to share information about UI to others. This also brought about a shift to a better quality of life, namely a more positive self-image and a greater sense of control of UI.

REFERENCES

1. John, W. S., Griffiths, S., Wallis, M., & McKenzie, S. (2013). Women's management of urinary incontinence in daily living. Journal of Wound Ostomy & Continence Nursing, 40(5), 524-532.
2. Mitteness LS, Barker JC. Stigmatizing a "normal" condition: urinary incontinence in late life. Med Anthropol Q 1995;9(2):188- 210.
3. Elo S, Kyngas H. The qualitative content analysis process. Journal of Advanced Nursing. 2008;62(1):107-15.

Funding Quebec Network for Research on Aging. **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov: NCT02039830 **RCT** Yes **Subjects** Human **Ethics Committee** Research **Ethics Committee** of Institut Universitaire de Gériatrie de Montréal (CER IUGM 12-13- 002), Centre Hospitalier de l'Université de Montréal (CE12.347), Centre Hospitalier de l'université de Sherbrooke (#12-170-M5 **Helsinki** Yes **Informed Consent** Yes

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ACUPUNCTURE FOR URINARY INCONTINENCE IN CHINESE WOMEN: A RANDOMIZED CONTROLLED TRIAL

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HYPOTHESIS / AIMS OF STUDY

To evaluate the effectiveness and quality of life (QoL) of acupuncture on urinary incontinence (UI) in Chinese women. We hypothesized that acupuncture will have additional improvement of UI symptoms and QoL to women who practice pelvic floor exercise (PFE) only.

STUDY DESIGN, MATERIALS AND METHODS

A parallel group, single blind, randomized controlled trial was conducted in a tertiary urogynecology center for 24 weeks. Women presented with UI and diagnosed to be 'kidney asthenia' by traditional Chinese medicine (TCM) assessment were randomized to have acupuncture and PFE (acupuncture group) or PFE only (control group). Non-Chinese, aged under 18, women who were pregnant or planning for pregnancy within the study period were excluded. Women with uncontrolled diabetes or hypertension or cardiovascular diseases, with history of pelvic floor injury, radiation or pelvic organ prolapses were also excluded. Written consent was obtained. Urinary Distress Inventory (UDI-6) and Incon-

tinence Impact questionnaires (IIQ-7), Visual Analogue Score (VAS) of severity of UI, 3-days bladder diary were collected at baseline. All women received an educational class on drinking and voiding habit and PFE at baseline. Randomization was conducted in 1:1 ratio. Ethical approval was obtained from institution.

In control group, women attended PFE training sessions at 6 weeks and 12 weeks. In acupuncture group, in addition to the same training sessions, women attended a weekly acupuncture session for six weeks (from week 1 to 6) by a registered Traditional Chinese Medicine (TCM) practitioner. Each session lasted for 20 minutes and the acupuncture points were chosen based on the previous literature: Shenshu (BL-23), Pangguanshu (BL-28), Ciliao (BL-32) and Zhongliao (BL-33), Guanyuan (REN-4), Henggu (KID-11), Qihai (REN-6), Sanyinjiao (SP-6), Zusanli (ST-36).

The primary outcome was the subjective outcome of UI at 12 and 24 weeks after treatment. Secondary outcomes included the urinary symptoms and QoL assessment by UDI-6, IIQ-7, VAS of UI severity, bladder diary at 12 and 24 weeks, any adverse event from acupuncture and the compliance of PFE in both groups.

The sample size calculation was based on the assumption that 50% of women in the control group and an addition of 25% in the acupuncture group would have improvement in their UI. The alpha level was set at 0.05 and power at 80. We assumed 15% women would be excluded after TCM assessment and a drop out rate of 20%, 85 subjects per group and a total of 170 subjects would be needed. Intention to treat analysis was carried out.

RESULTS

179 women were approached, 19 refused study and 23 were excluded after TCM assessment, leaving 137 women were randomized (69 in acupuncture group and 68 in control group) (Table 1). 63 (91.3%) women in acupuncture group and 59 (86.8%) in control group completed the follow up at 24 weeks. The primary and secondary outcomes were presented as in Table 2. The subjective improvement rate was significantly higher in acupuncture group (68.3% vs 47.1%, $p<0.01$) at 12 weeks but was not significant (79.4% vs 62.8%, $p=0.13$) at 24 weeks. There was a tendency of more improvement in the QoL and VAS score of UI severity in acupuncture group; however, they did not reach the statistical significance. There was no significant difference in the compliance of PFE in both groups. Nine (13%) women had minor complaint of numbness (4), persistent pain (2), bruises (2) or tiredness (1) after received acupuncture.

INTERPRETATION OF RESULTS

More women in acupuncture group had subjective improvement in their UI symptoms after 12 weeks. The QoL scores were reduced in both acupuncture group and controls group at 12 weeks; however, there was no significant difference between two groups. At 24 weeks, more women in acupuncture group had subjective improvement in their UI symptoms, but it was not statistically significant. There was no major adverse event in women received acupuncture, only 13% reported minor discomfort.

CONCLUDING MESSAGE

Acupuncture is a safe treatment modality for women with UI. More women (68.3 %) experienced subjective improvement after acupuncture and pelvic floor exercise than women practiced pelvic floor exercise only (47.1%) at 12 weeks. However, the difference was not significant at 24 weeks.

FIGURE 1

Table 1: Basic demographics

Characteristics	Acupuncture group (n=69)	Control group (n=68)	[1]P value	Excluded after TCM assessment (n=23)	[2]P value
Age at recruitment (years)	58.2 ± 9.1	56.2 ± 10.3	0.24	52.9 ± 12.4	0.09
Body Mass Index (kg/m^2)	25.4 ± 4.2	25.9 ± 4.8	0.54	24.6 ± 2.6	0.34
Parity	2 (1,2)	2 (1,2)	0.93	2 (1,2)	0.99
Postmenopausal	40 (58.0%)	40 (58.8%)	0.53	10 (43.5%)	0.60
UDI-6	8.6 (2.9)	9.2 (3.4)	0.23	7.9 (3.1)	0.25
IIQ-7	8.2 (5.0)	8.7 (5.0)	0.54	8.1 (5.3)	0.93
VAS- severity of UI	6.4 (2.2)	6.7 (2.3)	0.45	6.4 (2.1)	0.97
UI episodes (mean for 3 days)	1.3 (1.6)	2.4 (2.8)	0.01	-	-
Subjective severity					
- Mild	27	22	0.08	-	-
- Moderate	9	17		-	-
- Severe	3	6		-	-
Compliance of PFE (times/day)	2.0 (1.5)	1.8 (1.3)	0.55	-	-

[1]P value: comparison between acupuncture group and control group
[2]P value: comparison between women who were randomized and those not randomized.

FIGURE 2

Table 2. Primary and secondary outcomes at 12 weeks and 24 weeks

	12 weeks			24 weeks		
	Acupuncture group (n=67)	Control group (n=60)	P value	Acupuncture group (n=63)	Control group (n=59)	P value
Primary outcome						
Subjective outcome						
- Very much improved	14 (20.9%)	5 (8.3%)		11 (17.5%)	8 (13.6%)	
- Mildly improved	40 (59.7%)	27 (45.0%)	<0.01	39 (61.9%)	29 (49.2%)	0.13
- Same / mildly worsen /very much worsen	13 (19.4%)	28 (46.7%)		13 (20.6%)	22 (37.3%)	
Secondary outcomes						
UDI-6 score	6.6 (5.5)	7.7 (3.5)	0.18	7.0 (3.3)	8.1 (5.7)	0.24
IIQ-7 score	5.7 (5.3)	7.1 (4.6)	0.13	6.3 (5.0)	8.2 (5.3)	0.05
VAS- severity of UI	5.2 (2.3)	5.6 (2.1)	0.29	5.4 (2.3)	5.5 (2.1)	0.05
UI episodes (mean for 3 days)	1.2 (1.7)	1.8 (1.9)	0.09	1.0 (1.4)	1.3 (1.8)	0.22
Subjective severity						
- Mild	27 (40.3%)	28 (46.7%)		23 (36.5%)	21 (35.6%)	
- Moderate	11 (16.4%)	11 (18.3%)	0.35	13 (20.6%)	15 (25.4%)	0.71
- Severe	2 (3.0%)	6 (10.0%)		2 (3.2%)	2 (3.4%)	
Compliance of PFE (times/day)	2.0 (1.0)	2.0 (1.2)	0.91	1.8 (1.0)	1.9 (1.1)	0.57

Data presented in number (percentage) or mean (standard deviation).

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A SYSTEMATIC REVIEW OF SEXUAL PROBLEMS IN WOMEN WITH MULTIPLE SCLEROSIS: PATTERNS OF DYSFUNCTION AND MANAGEMENT OPTIONS

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HYPOTHESIS / AIMS OF STUDY

Multiple sclerosis (MS) is an inflammatory disorder affecting the central nervous system with a typical onset between 3rd and 4th decade of life. Sexual dysfunction (SD) is considered to be one of the most common symptoms of MS, including loss of libido, problems in arousal, orgasm and lubrication, dyspareunia, and dissatisfaction with sexual life. Sexual difficulties can arise directly as a result of MS lesions (primary SD), consequent to neurological disabilities (secondary SD) or resultant psychosocial issues (tertiary SD). The interrelationship between these different factors and possible therapeutic interventions have been poorly explored. A systematic review was conducted to answer the following questions:

(1) What is the prevalence of sexual dysfunction in female patients with MS?,

(2) What are the patterns of sexual difficulties reported by women with MS?,

(3) What are the interventions that have been evaluated for managing SD in women with MS?

STUDY DESIGN, MATERIALS AND METHODS

: The Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) statement was followed for review of publications. The protocol for this review has been registered with PROSPERO (CRD42017060620: http://www.crd.york.ac.uk/PROSPERO). The following keywords were used in the search strategy: "neurogenic sexual dysfunction" AND "multiple sclerosis" AND "sexual dysfunction" OR "sexual symptom" OR "sexual disorder" OR "sexual satisfaction" OR "sexual function" OR "female sexual dysfunction" AND "treatment" OR "management" OR "symptoms". The Cochrane Database of Systematic Reviews (The Cochrane Library); MEDLINE; EMBASE; CINAHL; AMED; PsycINFO; PEDro (Physiotherapy Evidence Database); Database of International Rehabilitation Research; Database of Abstracts of Reviews of Effects (DARE) (The Cochrane Library, latest issue); Occupational Therapy Systematic Evaluation of Evidence (OTseeker); ClinicalTrials.gov; Current Controlled Trials (http://www.controlled-trials.com/) were searched until April 2017. No limitations were placed on a date. Studies reporting the prevalence, pattern, and treatment options (either pharmacological or non-pharmacological) of sexual dysfunction in female patients with multiple sclerosis were included. Non-original articles, not published in English, conference abstracts, and publications involving children, male, not relevant outcomes, non-human studies, systematic or narrative reviews were excluded. Risk-of-bias and confounder assessment were performed by The Quality Assessment Tool for Quantitative Studies (The Effective Public Health Practice Project – EPHPP). Two authors independently assessed the eligibility of all studies and extracted data on study design, population characteristics, patterns of sexual dysfunction, measurement instrument, and prevalence rates.

RESULTS

The search came up with 481 studies, however only 50 (29 observational, 13 case-control, 8 interventional) publications covering a total of 19,105 people with MS and 1000 healthy controls were identified a relevant. Sexual functions were evaluated using the FSFI (39%) or MSISQ-19 (21.5%) in most studies. Prevalence rate was reported in 27 studies and ranged from 28.3% to 91%. Most commonly reported sexual difficulties were problems with desire (5.6-75%) (14 studies), arousal problem (7.9-89%) (16 studies), orgasmic dysfunction 4.5-77% (26 studies), lack of lubrication (5.6-51.5%) (20 studies), dissatisfaction with sexual life (6.7-52.5%) (9 studies), dyspareunia (4-23%) (7 studies) and decreased genital sensation (17.6-61.7%) (12 studies). Percentage of patients reporting primary SD was 43-83.3% (4 studies), secondary SD was 37.5-56.8% (3 studies) and tertiary SD 29.5-33.3% (2 studies).

Clinical parameters found to be associated with SD were advancing age, lower educational level, longer length of marriage, longer disease duration, progressive MS, greater neurological disability (EDSS score), the presence of depression and anxiety, fatigue, poor mental health and poor quality of life.

Studies showed beneficial effects of non-pharmacological interventions such as sexual therapy (1 per week x 12 week, RCT), sexual counselling (one 90-min session per week x 4 weeks, RCT), psychoeducation and sexual counselling (3 visit over 6 months, RCT), mindfulness, psychoeducation and cognitive behavioral therapy (90 minute sessions x 5 weeks, pre/post study), pelvic floor muscle training and/or electrical stimulation and yoga training on sexual function.

Only two studies reported the effects of pharmacological interventions. Use of sildenafil resulted in improvement in vaginal lubrication (RCT) and improvement of urinary incontinence after intradetrusor injections of botulinum toxin were associated with beneficial effects in sexual functions. Quality of evidence in all studies was weak.

INTERPRETATION OF RESULTS

There is a substantial variability in reported sexual dysfunction based on different methods to determine SD and lack of information on sampling method. The most commonly reported patterns of SD in women with MS were problems with desire, arousal, and orgasm. Clinical parameters were

found to contribute to SD. There are some studies to determine the efficacy of interventions for SD but these were mainly observational.

CONCLUDING MESSAGE
Sexual dysfunction is highly prevalent in women with MS and different domains of sexual functions are affected. Well designed studies evaluating practical strategies and pharmacological interventions are lacking.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Because this is a systematic review **Helsinki** Yes **Informed Consent** No

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SPECTRAL ANALYSIS OF URODYNAMIC DATA CAN PICK UP LOW AMPLITUDE PHASIC BLADDER AND RECTAL CONTRACTIONS IN NEUROGENIC BLADDER PATIENTS

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HYPOTHESIS / AIMS OF STUDY
During the evaluation of urodynamic studies, rhythmic contractions can be seen in patients with neurogenic bladders and in many instances these contractions are not counted as detrusor overactivity (DO) because they do not meet the predefined criteria for detrusor overactivity and are subsequently ignored. Recent Work by Colhoun et al. have identified low amplitude rhythmic contractions (LARC) in patients with OAB in muscle specimens, as well as in bladder pressure studies using fast fourier transform (FFT) analysis. FFT is a form of signal analysis which is capable of taking data that has a cyclic nature and identifying hidden frequencies or periodicity in the data.

We hypothesized that in many of our neurogenic patients we would be able to find rhythmic patterns using FFT on the raw urodynamic data that is readily available to the urodynamicists that would match the low amplitude contractions that were seen on the urodynamic studies.

STUDY DESIGN, MATERIALS AND METHODS
The study was designed as a pilot study to evaluate the hypothesis that LARC commonly seen in neurogenic patients urodynamic studies could be identified with FFT based spectral analysis and these would coincide with each other. IRB approval was obtained for the use of deidentified urodynamic data. There were 39 urodynamic studies available for review from 21 patients. Some patients had 2 studies on the same day, while 7 patients had pre and post botulinum A injection studies, others had studies after starting new therapy or an increase in medication doses. Urodynamic data was exported from a Laborie machine into a text delimited format and then run through MATLAB where a spectral analysis was performed using FFT over the whole time span of the urodynamic procedure. Approximate entropy (ApEn) was calculated and displayed using a MATLAB. Urodynamic curves were compared to the results from the FFT analysis. Results were recorded if there were LARC visible on the abdominal, and detrusor channels and the frequency of the 3 highest peaks for each channel were recorded. The slope of the ApEn was compared to the urodynamic curve and confirmation was made whether the entropy rose or declined with increasing bladder volume. Statistics were performed using Excel (Microsoft, Redmond Washington) and Xlstat (Addinsoft, Paris France).

RESULTS
39 Urodynamic studies were analyzed from 21 patients (9 male and 12 female) with a mean age of 10.8 (sd=5.1). Spectral density graphs were produced for each urodynamic study and the peaks for each urodynamic parameter were plotted and the first 3 highest peaks if present were recorded and tabulated for the Abdominal and Detrusor curves. (Figure 1). Invariable a spike was noted in the range of 1 cycle/min or a period of 60 secs in both the abdominal and Detrusor spectral analysis. In 35 of 39 plots phasic detrusor contractions were identified in the the second spectral band (median 2.7 cycles/min). In 1 of the 4 who did not have a spectral peak this patient had an underactive bladder, while the other 3 had received botulinum toxin A injections 2- 3 months earlier. 17 of 39 studies had a drop in approximate entropy and 3 of the 4 without phasic detrusor contractions showed no decrease in the ApEn. The patient with underactive bladder did not have a decrease in ApEn nor did he have phasic contractions. Of the seven patients that underwent Botulinum toxin A injections 6/7 had no decrease in entropy and the one that did had had an injection more than 6 months earlier. A normality test was run on the data and the data was determined to not follow a normal distribution.

INTERPRETATION OF RESULTS
Standardization of urodynamics by utilizing objective criteria is a critical need in urology and especially when medications are being assessed for efficacy. The present criteria we have at this time relies on a large amount of subjectivity and can leave things open to interpretation. One common problem in pediatric patients with neurogenic detrusor overactivity (NDO) is that in many cases low level phasic contractions are ignored as not being significant. It is critical in this NDO population that these contractions be eliminated since continued contractions can be detrimental to the patients over the long-term. Utilizing FFT analysis of the pressure curves allows for identification of signals that may indicate bladder overactivity and in some cases we have seen spectral evidence of contractions that were not apparent but were ameliorated after Botulinum toxin A injections. We also saw that the ApEn decreased in almost all patients after Botulinum toxin A injections indicating that there may be a beneficial effect by Botulinum toxin A in eliminating LARC in NDO bladders. As the ApEn decreases we see an increase in order which is associated with an increase in the phasic contrac-

tions amplitude on the urodynamic tracings. This is exactly what we would expect to see; the increase in order leads to concerted contractions throughout the detrusor thereby increasing the amplitude of the contraction. Increasing ApEn would lead to chaotic contractions and thereby not lead to phasic contractions. Our findings diverge minimally from the work by Colhoun et al., we observed a frequency was an average of 2.7 cycles/min which has a period of 22 sec between contractions, while they observed a frequency of 2.34 cycles/min or a period of 25 sec between contractions. Whether these differences are significant or just differences in technique it is reassuring that the numbers are relatively close together indicating that the technique is reproducible.

CONCLUDING MESSAGE

We have seen that use of FFT based spectral analysis can produce results that give important data that can substantiate the effects of medical treatment in this pilot study. Additionally our data matches the results noted by colhoun et al in their series of patients with detrusor overactivity due to overactive bladder. This indicates that there is a similarity and a regularity to the overactive detrusor contractions seen in both OAB and NDO patients. Further work needs to be done to further improve the predictive power of this technique.

FIGURE 1

Statistic	Cycles/minute Minimum	Cycles/minute Maximum	Cycles/minute 1st Quartile	Cycles/minute Median	Cycles/minute 3rd Quartile	Cycles/minute Mean	Standard deviation (n)	Lower bound on mean (95%)	Upper bound on mean (95%)
abd freq 1	0.500	3.000	0.700	1.000	1.000	0.995	0.440	0.850	1.139
abd freq 2	1.700	6.200	2.000	2.500	3.775	3.037	1.271	2.554	3.519
abd freq 3	1.200	7.500	3.650	4.300	6.000	4.622	1.597	3.979	5.266
ves freq 1	0.700	4.500	1.000	1.000	1.800	1.469	0.779	1.213	1.725
ves freq 2	1.700	6.500	2.000	2.700	3.800	3.066	1.189	2.651	3.480
ves freq 3	3.000	8.000	4.000	5.000	6.625	5.417	1.502	4.769	6.064

REFERENCES

1. Low amplitude rhythmic contraction frequency in human detrusor strips correlates with phasic intravesical pressure waves. Colhoun AF, Speich JE, Cooley LF, Bell ED 3rd, Barbee RW, Guruli G, Ratz PH, Klausner AP.World J Urol. 2017 Aug;35(8):1255-1260. doi: 10.1007/s00345-016-1994-0. Epub 2016 Dec 26.

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"BLADDER-FIRST" FORM OF MULTIPLE SYSTEM ATROPHY: A MESSAGE FROM URO-NEUROLOGISTS

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HYPOTHESIS / AIMS OF STUDY

Multiple system atrophy (MSA) is a disease which combines autonomic (postural hypotension and/or urogenital dysfunction) and motor disorders. Some patients are "bladder-first" cases, who later develop further manifestations of MSA. However, thus far such cases have been poorly recognized and characterized. We here present detailed history taking and questionnaire data in 121 patients with MSA.

STUDY DESIGN, MATERIALS AND METHODS

Detailed history and questionnaire of autonomic symptoms were performed in121 MSA patients: 48 with MSA-C (cerebellar form), 17 with MSA-P (parkinsonian form), and 56 with MSA-'Auto' (P/C) (either cerebellar or parkinsonian form), where autonomic symptoms are the initial and main clinical feature, and mild parkinsonism, cerebellar ataxia and/or pyramidal involvement appear during the course of disease.

RESULTS

Among these 3 forms the difference between urinary and orthostatic symptoms was prominent in patients with MSA-C (urinary symptoms in 92%, orthostatic in 10%; $p<0.01$) and with MSA-P (94%, 6%; $p<0.01$) compared with those with MSA-'Auto' (100%, 82%). In MSA-'Auto', 40 started without gait disturbance. In this group, in patients with urinary and orthostatic symptoms (n=32), those patients who had of urinary symptoms first (n=22, 68.7%) were more common than those who had orthostatic symptoms first (n=10, 31.3%). The longest interval between urinary and gait difficulty was 7 years.

INTERPRETATION OF RESULTS

The results of the present study show that 18.2% of the MSA patients studied started with urinary symptoms alone, without any other motor/autonomic symptoms. The results are in accordance with previous cohort/case studies. Our results are clinically relevant, since such patients see urologists or physicians first, because of their urinary symptoms. In particular, men with MSA often undergo prostatic surgery after a diagnosis of prostatic hyperplasia, before the correct diagnosis is made by neurologists, often with unfavorable results. 6 For this reason, we should keep in mind that a proportion of MSA patients start with urinary symptoms alone, without any other motor/other autonomic symptoms. MSA is a more aggressive disorder than Parkinson's disease. Surgical treatment of bladder outlet obstruction often fails in MSA patients and should be avoided; this is in contrast to

Parkinson's disease, in which prostatic surgery is not contra-indicated.13 In Parkinson's disease, "bladder-first" cases are extremely rare.

CONCLUDING MESSAGE

18.2% of MSA patients started with urinary symptom alone. Such patients see urologists first before the correct diagnosis is made. In order to avoid unnecessary prostatic surgery, collaboration of urologists and neurologists is essential for early, correct diagnosis and management.

FIGURE 1

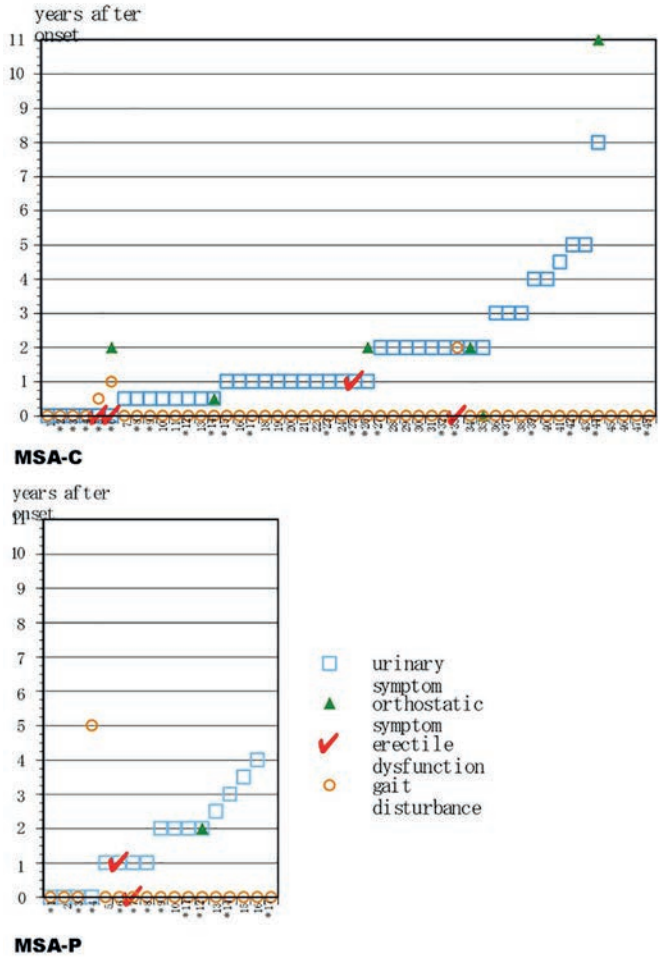
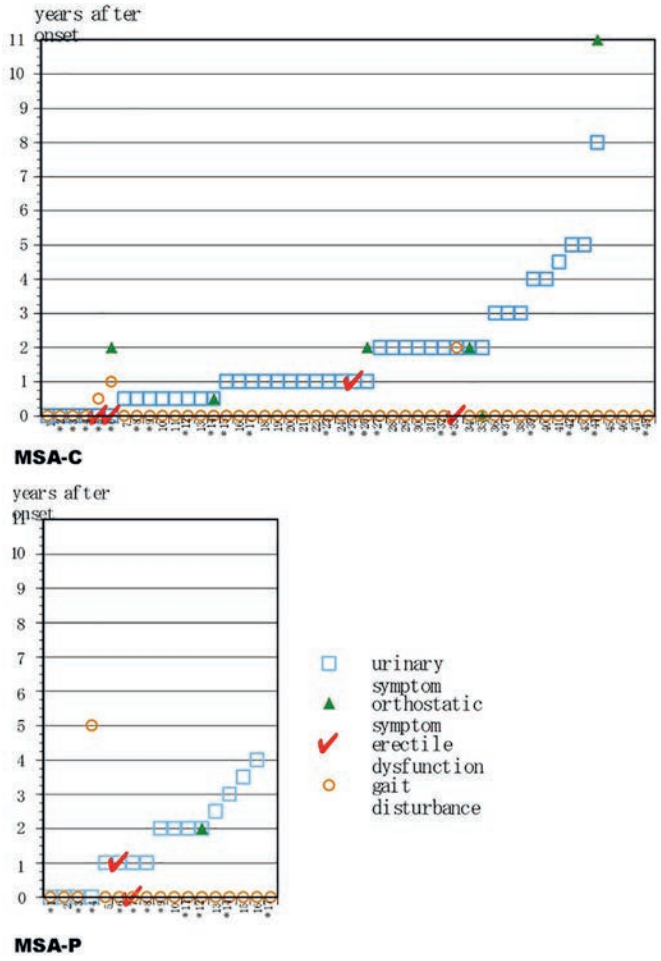


FIGURE 2



REFERENCES

1. Urinary dysfunction and orthostatic hypotension in multiple system atrophy: which is the more common and earlier manifestation? J Neurol Neurosurg Psychiatry. 2000; 68: 65-69.
2. Lower urinary tract symptoms of neurological origin in urological practice. Clin Auton Res. 2013; 23: 67-72.
3. First symptoms in multiple system atrophy. Clin Auton Res. 2018 Jan 8. doi: 10.1007/s10286-017-0500-0. [Epub ahead of print]

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NEURO-UROLOGY: IS THERE STILL A PLACE FOR BLADDER AUGMENTATION AND URINARY DIVERSION?

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HYPOTHESIS / AIMS OF STUDY
Intradetrusor onabotulinumtoxinA injections have revolutionized the treatment of refractory neurogenic detrusor overactivity. As a consequence, bladder augmentation and urinary diversion for neuro-urological indications have almost disappeared from the operating theatres and many urologists will no longer be confronted with patients undergoing such reconstructive procedures for refractory neurogenic lower urinary tract dysfunction (NLUTD) during their careers. With this background assumption we assessed if there is still a place for bladder augmentation and urinary diversion in modern neuro-urology.

STUDY DESIGN, MATERIALS AND METHODS
Between January 2011 and October 2017, a total of 51 patients underwent bladder augmentation (n=12) or urinary diversion (ileal conduit: n=31, continent catheterisable reservoir, n=8) for NLUTD.

RESULTS
Of the 51 patients, mean age was 47 years (standard deviation ±16 years) and 25 (49%) were women. 20 patients suffered from spinal cord injury, 14 from multiple sclerosis, 8 from spina bifida, and 9 from other neurological disorders. Before bladder augmentation, patients were treated with 2 to 3 different antimuscarinics and with 2 to 16 intradetrusor onabotulinumtoxinA injection cycles. All patients with urinary diversion underwent cystectomy. Reasons for ileal conduit and decisions against continent catheterisable reservoir were severely impaired hand (n=18) or cognitive (n=8) function making intermittent self-catheterization impossible, renal failure in 3 and patients' preference in 2 patients.

INTERPRETATION OF RESULTS
Looking at our cohort, all patients had a long history of suffering behind them with repetitive outpatient visits and hospitalizations as well as several unsuccessful conservative / minimally invasive treatments, before the decision for a surgical solution was made. In modern neuro-urology, a careful assessment together with the patient and their caregivers must be made to guarantee an optimal customized treatment protecting the upper and lower urinary tract and improving health-related quality of life.

CONCLUDING MESSAGE
Despite the triumphal era of onabotulinumtoxinA treatment in neuro-urology, there is still a place for bladder augmentation and urinary diversion in very selected patients with refractory NLUTD. Thus, meticulous knowledge transfer to upcoming neuro-urologists is of utmost importance to guarantee optimal treatment for prospective neuro-urological patients.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Kantonale Ethikkommission Zürich **Helsinki** Yes **Informed Consent** Yes

35 www.ics.org/2018/abstract/35

PATHOPHYSIOLOGICAL BASIS FOR LOWER URINARY TRACT DYSFUNCTION IN A COHORT OF PATIENTS WITH MITOCHONDRIAL DISORDERS

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HYPOTHESIS / AIMS OF STUDY
Mitochondrial disorders are a group of phenotypically, biochemically and molecularly heterogeneous genetic diseases resulting from diminished cellular energy production due to impaired oxidative phosphorylation. There is multisystem involvement with tissues with high energy demands being particularly vulnerable. Some studies have shown that the gastrointestinal (GI) system can be affected, with slowed GI motility resulting in constipation and pseudo-obstruction. However, there had been no studies evaluating changes in lower urinary tract (LUT) functions in mitochondrial disease. Recently, we have shown that patients with mitochondrial disorders experience more urinary symptoms compared with healthy controls. But the pathophysiological basis for LUT dysfunction is poorly characterized in this group. The purpose of this study was to evaluate the urodynamic findings in a cohort of patients with mitochondrial disorder reporting lower urinary tract symptoms.

STUDY DESIGN, MATERIALS AND METHODS
Fourteen patients with mitochondrial disorders were enrolled and investigated by uroflowmetry and/or measurement of postvoid residual urine volume (PVR). Four patients were also investigated by urodynamic study (UDS).

RESULTS

The mean maximum flow rate (Qmax) was 20.16 ml/sec (SD: 9.768) and three of 12 patients who underwent uroflowmetry had a low Qmax (<10ml/sec). Nine patients have abnormal findings of uroflow rate curve - intermittency, irregular stream and prolonged flow. The mean PVR was 87.93 ml (SD: 129.1). Seven of 14 patients who underwent measurement of PVR had over 30 ml PVR and 5 of them had about or over 100 ml PVR. One of 4 patients who were investigated by UDS had detrusor overactivity (DO) and another one had increased bladder sensation (bladder volume at first sensation was 62ml; bladder volume at strong desire to volume was 234ml) without DO during storege phase. Low Qmax was found in 3, low Pdet at Qmax was found in all 4 UDS recordings and AG number was low (<20) in all during voiding phase, suggesting detrusor underactivity without bladder outlet obstruction.

INTERPRETATION OF RESULTS

In this preliminary study, storage dysfunction such as DO and increased bladder sensation without DO was found in some patients with mitochondrial disorders. Low flow rate and large PVR due to detrusor underactivity appears to be a coomon in patients with mitochondrial disorders. The cause for this is uncertain, however may reflect involvement of bladder and the nervous system controled LUT and diminished cellular energy production which is characteristic of this condition. Caution is therefore advised when commencing patients on treatments for overactive bladder symptoms such as antimuscarinic agents in view of the increased risk for developing incomplete bladder emptying. Despite the high prevalence of storage symptoms in this group, objective changes in UDS are variable and can include DO and early perception of bladder filling.

CONCLUDING MESSAGE

Significant pathophysiological changes in LUT control are seen in patients with mitochondrial disorders. Detrusor underactivity appears to be a common finding , despite the paucity of voiding symptoms. This implication may be useful in estimating the pathological condition and planning of the management for LUT sympotms in these patietns.

Funding No funding or grant **Clinical Trial** No **Subjects** Human **Ethics Committee** University College London **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "IMAGING"

RESTING STATE ANALYSIS OF SUBTHALAMIC NUCLEUS FUNCTIONAL CONNECTIVITY ACROSS BLADDER STATES IN PARKINSON'S DISEASE

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HYPOTHESIS / AIMS OF STUDY

Subthalamic nucleus (STN) deep brain stimulation (DBS), an established treatment for Parkinson's disease (PD), has been shown to modify urine storage characteristics in animals models (1) and improve overactive bladder symptoms and urodynamic storage function in PD patients with DBS electrodes implanted for treatment of movement disorder symptoms (2,3). Understanding of the mechanisms underlying these changes should lead to improved treatment of overactive bladder problems in PD, and possibly in other conditions also. As a first step we aimed to investigate the connections of the STN in PD patients, and in particular how they changed with bladder filling, using magnetic resonance (MR) resting-state functional connectivity analysis.

STUDY DESIGN, MATERIALS AND METHODS

11 DBS-naive PD subjects underwent resting state fMRI scans in two bladder states: (1) "full bladder" and (2) "empty bladder". Subjects were required to withhold their morning Parkinson's medications on the day of testing. 2 subjects were excluded from further analysis, 1 due to caffeine consumption and 1 due to dopaminergic medication on the morning of scanning.

The full bladder scan was carried out first, during which two 7.5 minute BOLD sequences were run. Subjects were asked to rate their sensation of bladder fullness according to the following scale (0 = no bladder sensation, 1 = first sensation of bladder filling, 2= first desire to void, 3 = normal desire to void, 4 = strong desire to void, 5 = maximal bladder capacity) before each scan started. Following the 2 scans, subjects voided to empty their bladder and returned to the scanner. Two further 7.5 minute BOLD sequences were run, and a high-resolution structural scan was also obtained. Data was preprocessed and denoised in the standard way with motion correction, brain extraction, B0 unwarping, high pass filtering and smoothing using a Gaussian kernel of 8mm full width half maximum (FWHM). ICA denoising was then carried out, to remove signal related to movement, vasculature, CSF and other artefactual sources. This was done with reference to standard network templates and normal frequency ranges for brain network activity. Right and left STN masks were created using the subthalamic nucleus atlas available in the FMRIB software library (FSL). Dual regression was run using a paired t test design (comparing full and empty bladder conditions) with the STN mask as a seed.

RESULTS

Functional connectivity (FC) between the STN and the lingual gyrus was significantly lower in the full bladder compared with the empty bladder condition (signifying reduced connectivity in full bladder compared with empty bladder). This was the only significant change in STN connectivity corresponding with bladder state. Post hoc connectivity analysis using the lingual gyrus as a seed region demonstrated significant increases in FC between the lingual gyrus and multiple areas previously linked with bladder sensation (e.g. insula), and urinary urgency (e.g. anterior cingulate cortex) in the full compared with the empty bladder state.

INTERPRETATION OF RESULTS

These data suggest that an STN-lingual gyrus pathway plays a critical part in bladder control in PD, and in particular in the improvement in bladder symptoms following STN DBS. Potentially, DBS may augment STN FC with the lingual gyrus as the bladder fills, and thus, via the numerous cortical connections of this brain region, gain access to bladder sensory networks such as those centred on the insula and anterior cingulate, so enabling improved bladder control.

CONCLUDING MESSAGE

Brain imaging has revealed new aspects of the bladder control system: (1) a likely mechanism by which deep brain stimulation of the STN may improve bladder symptoms in PD; (2) the importance of the connectivity between STN and lingual gyrus; and (3) the extensive connections between the lingual gyrus and bladder sensory networks, which form a link not previously described between the deep brain (STN), the lingual gyrus and cortical regions involved in control of the bladder.

REFERENCES

1. Effects of high frequency deep brain stimulation on urine storage and voiding function in conscious minipigs. Dalmose AL, Bjarkam CR, Sorensen JC et al. Neururol Urodyn 2004;23(3):265-72
2. Effect of subthalamic deep brain stimulation on the function of the urinary bladder. Seif C, Herzog J, van der Horst C, et al. Ann Neurol. 2004 Jan; 55(1):118-20
3. Effects of subthalamic nucleus stimulation on urodynamics findings in patients with Parkinson's disease. Finazzi-Agro E, Peppe A, D'Amico A, et al . J Urol. 2003 Apr;169:1388-91

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CORRELATION OF VIDEO-URODYNAMIC FINDINGS AND ELECTROPHYSIOLOGICAL CHARACTERISTICS WITH LEVEL AND DEGREE OF SPINAL CORD INJURY

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HYPOTHESIS / AIMS OF STUDY

To investigate the relationships between the video-urodynamic findings, pelvic floor electrophysiological characteristics and the level and degree of spinal cord injury (SCI).

STUDY DESIGN, MATERIALS AND METHODS

This retrospective review analyzed the clinical records, video-urodynamic and pelvic floor electrophysiological data of 647 patients with traumatic spinal cord and out of spinal shock. Patients were classified based on American Spinal Injury Association (ASIA) Impairment Scale (AIS) and video-urodynamic findings. The thoracic injury was divided to the level of T1-9 and T10-12 because the sympathetic innervation of the low urinary tract originates the T0-L2.

RESULTS

Of the 647 patients, the proportion of cervical, T1-9 thoracic, T10-12 thoracic and lumbar spinal cord injury and conical caudal injury were 29.3% (190), 21% (136), 28.1% (182), 6.2% (40) and 15.4% (99). Detrusor overactivity (DO) with or without detrusor sphincter dyssynergia (DSD) was found in 79.5% (151/190), 61% (83/136), 35.2% (64/182), 35% (14/40) and 19.2% (19/99) of patients with cervical, thoracic (T1-9), thoracic (T10-12), lumbar and conical caudal injury respectively. Only one patient with incomplete lumbar injury had normal bladder. The other patients manifested detrusor underactivity (DU). Bulbocavernosus reflex (BCR) was found in 95.3% (191/190), 68.4% (93/136), 52.2% (95/182), 60% (24/40) and 45.5% (45/99) of patients with cervical, thoracic (T1-9), thoracic (T10-12), lumbar and conical caudal injury. However, The manifestation of BCR also related to the degree of SCI. Sensory evoked potential (SEP) was presented in 9 complete SCI patients and 70 incomplete SCI patients.

INTERPRETATION OF RESULTS

Both DO and DU are found not only in the patients with cervical and thoracic SCI but also in ones with lumbar and conical caudal SCI; SPE is existed in complete SCI patients.

CONCLUDING MESSAGE

This study indicated a significant correlation between the level of SCI and the video-urodynamic characteristics, but clinical examination cannot be alone to predict the type of bladder function after SCI and urodynamic testing is necessary. Additionally, the manifestation of BCR and SEP are associated with the level and degree of SCI.

Funding No **Clinical Trial** No **Subjects** Human **Ethics Committee Ethics Committee** of CRRC **Helsinki** Yes **Informed Consent** No

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THE PROFILE OF BLADDER AND BOWEL COMPLAINTS IN PATIENTS WITH HEREDODEGENERATIVE SPINOCEREBELLAR ATAXIA

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HYPOTHESIS / AIMS OF STUDY

Spinocerebellar ataxia (SCA) is a group of genetic neurodegenerative conditions characterized by cerebellar ataxia and variable neurological signs that result in progressive motor disability and wheelchair dependence. Pathological changes affect regions of the brain responsible for motor control such as the cerebellum, brainstem, spinal cord and peripheral nerves. There are many different sub-types of SCAs according to the genetic mutation, and SCA1, 2, 3, 6 and 7 are most common, though the prevalence of each type varies country-wise.

Preliminary reports suggest that lower urinary tract (LUT) dysfunction may occur in SCAs. LUT dysfunction is likely to be a result of neurological damage. Bowel symptoms have been anecdotally reported in all SCAs, although it is thought that those symptoms may be not rare in SCAs.

LUT symptoms increases the risk for falls and fractures in this vulnerable cohort of neurological patients, and the aim of this study was to prospectively characterize LUT and bowel symptoms in a large cohort of patients with SCA.

STUDY DESIGN, MATERIALS AND METHODS

Consecutive patients with genetically confirmed SCA and attending a dedicated tertiary-level academic Ataxia Centre were prospectively approached over the period of 2012-2018. Fifty-one patients with SCAs were included in this Service Evaluation registered with the Divisional governance board. Subjects were evaluated using scales for the assessment and rating of ataxia (SARA), LUT symptom questionnaires- Urinary Symptom Profile (USP), IPSS, SF-Qualiveen questionnaire, and bowel dysfunction- neurogenic bowel dysfunction (NBD) questionnaire.

RESULTS

The numbers of patients with SCA1 are 4, SCA2 are 11, SCA3 are 13, SCA6 are 17, and SCA7 are 6. Average SARA in all patients is 13.75 (SD 7.937); SCA1: 10.88 (SD 10.71), SCA2: 11.41 (SD 5.732), SCA3: 17.04 (SD 8.902), SCA6: 12.79 (SD 10.71), SCA7: 15.9 (SD 4.317). Average stress urinary incontinence score of USP in all patients is 2.784 (SD 13.855); SCA1: 0.500 (SD 1.000), SCA2: 0.091 (SD 0.032), SCA3: 8.692 (SD 27.17), SCA6: 1.235 (SD 2.658), SCA7: 0.833 (SD 0.983). OAB symptoms are reported in 21 (41.2%) of all patients. Average OAB score of USP in all patients is 6.633 (SD 14.05); SCA1: 5.500 (SD 1.915), SCA2: 2.400 (SD 2.875), SCA3: 13.54 (SD 26.123), SCA6: 4.824 (SD 3.972), SCA7: 4.667 (SD 3.724). Average low stream score of USP in all patients is 1.060 (SD 1.834); SCA1: 2.250 (SD 2.630), SCA2: 1.000 (SD 1.483), SCA3: 1.538 (SD 2.727), SCA6: 0.412 (SD 0.795), SCA7: 1.167 (SD 1.169). Average IPSS in all patients is 9.600 (SD 18.94); SCA1: 8.500 (SD 3.786), SCA2: 4.909 (SD 6.204), SCA3: 13.92 (SD 25.85), SCA6: 4.941 (SD 3.132), SCA7: 21.67 (SD 38.17). Average SF-Qualiveen overall score in all patients is 3.049 (SD 14.22); SCA1: 3.031 (SD 3.659), SCA2: 0.450 (SD 0.872), SCA3: 8.933 (SD 27.087), SCA6: 0.703 (SD 0.801), SCA7: 1.104 (SD 1.288). Average NBD total score in all patients is 0.878 (SD 1.666); SCA1: 0.750 (SD 1.500), SCA2: 0.600 (SD 1.265), SCA3: 1.385 (SD 2.256), SCA6: 0.588 (SD 1.460), SCA7: 1.000 (SD 1.549). Average general satisfaction with bowel management in all patients is 8.641 (SD 2.006); SCA1: 7.667 (SD 1.528), SCA2: 9.000 (SD 2.646), SCA3: 8.222 (SD 2.539), SCA6: 8.714 (SD 1.541), SCA7: 9.400 (SD 0.894).

INTERPRETATION OF RESULTS

Interpretation of results

LUT symptoms are prevalent in patients with genetically confirmed SCAs. OAB symptoms are reported in nearly half of all patients. LUT symptoms across different SCAs differ significantly. The prevalence of stress urinary incontinence was particularly high in patients with SCA3 and may be due to neurogenic pelvic floor denervation. A low stream score across different groups suggest that voiding dysfunction is relatively minor problem. A low average NBD total score suggests that bowel dysfunction is mild.

CONCLUDING MESSAGE
OAB symptoms are commonly reported across different subtypes of SCAs, associated with significant impact on quality of life. Stress incontinence is particularly common in SCA3 compared to other SCAs. Bowel dysfunction is uncommonly reported.

Funding No funding or grant **Clinical Trial** No **Subjects** Human **Ethics Committee** University College London **Helsinki** Yes **Informed Consent** Yes

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PATIENT REPORTED OUTCOMES AFTER ILEOCYSTOPLASTY IN SPINAL CORD INJURY POPULATION

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HYPOTHESIS / AIMS OF STUDY
Ileocystoplasty (IC) is the most popular bladder augmentation procedure. According to the literature, it stabilizes renal function and prevents anatomical deterioration. In the spinal cord injury (SCI) population, it is reserved for those who have failed pharmacotherapy and minimally invasive treatment options such as botulinum toxin injections.

Many symptomatic patients are reluctant to have an IC due to the morbidity associated with the procedure. Ancedotally, multiple consultations are often required prior to a patient consenting for this procedure. The aim of this study was to assess the outcomes of IC from the patient's perspective.

STUDY DESIGN, MATERIALS AND METHODS
A retrospective survey was conducted of SCI patients who underwent IC from 2009 to 2014 in our unit. The Qualiveen questionnaire was utilised, which has been validated for neurogenic bladder dysfunction. To avoid recall bias, 10 randomly selected SCI who were due for IC served as controls.

The primary end point was the change in total Qualiveen score. The secondary outcomes were the changes in the Qualiveen domains, quality of life score and the degree of satisfaction in a scale from 0-10. Pearson test was used for correlations and t-test to assess intra group variability.

RESULTS
The questionnaire was posted to 45 patients and 37 completed it. There was a strong correlation among the pre-operation scores and control scores ($r=0.894$). The mean difference in total Qualiveen score was -21.1 ($p<0.001$). The mean difference in bother domain was -1.43 ($p<0.001$), in restrictions domain +0.5 ($p=0.03$), in forced domain +0.98 ($p=0.002$), in worries domain -1.09 ($p=0.01$) and in feel domain -1.16 ($p<0.001$). Quality of life was improved in 89.2% of patients. At average, each candidate required 10.9 (0-36) months to decide and consent. The degree of satisfaction was 7.83 (0-10). The average recovery time and return to preoperative activities, was reported to 5.1 (1-19) months.

The most frequent reported complication was urinary tract infections and bladder stones that require 1.2 admissions per year per patient

INTERPRETATION OF RESULTS
The results show that there is high degree of satisfaction, as evidenced from the Qualiveen scores, and all domains were significantly improved. In addition, average recovery time and return to preoperative activities is within acceptable limits. The complications can be minimized by diet modification and regular bladder wash outs.

CONCLUDING MESSAGE
Clam ileocystoplasty remain the cornerstone in managing difficult, poorly compliant bladders in spinal cord individuals. During consultation, the surgeon should inform the potential candidates for the degree of satisfaction, the postoperative complications and the timing regarding the return to normal activities.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** local committee **Helsinki** Yes **Informed Consent** Yes

40 www.ics.org/2018/abstract/40

10 YEAR EXPERIENCE OF INTRA-DETRUSOR BOTULINUM TOXIN TYPE A INJECTIONS IN CHILDREN AND YOUNG PEOPLE WITH NEUROGENIC DETRUSOR OVER-ACTIVITY FOLLOWING SPINAL CORD INJURY – IS IT A LONG TERM MANAGEMENT SOLUTION?

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HYPOTHESIS / AIMS OF STUDY
Intra-detrusor injections (IDI) of botulinum toxin type A (BTXA) have been used for many years in the management of patients with neurogenic detrusor over-activity (NDO). There is anecdotal evidence to suggest that the duration of effect reduces with time in adults.

In this study we present 10 years of follow up of children and young people (CYP) who have been treated with IDI of BTXA to manage NDO subsequent to spinal cord injury (SCI). The aim of the study was to investigate whether IDI of BTXA is an effective and tolerated management solution for CYP with NDO following SCI.

STUDY DESIGN, MATERIALS AND METHODS

The study was a retrospective analysis of CYP in a Spinal Cord Injury Centre (SCIC) who have received IDI of BTXA as part of bladder management for NDO. All patients had urodynamically proven NDO. Age at injury, cause of injury, impairment, bladder management, age at first injection, number of repeat injections, dose and formulation of BTXA, and current bladder management status of patients was recorded. A Kaplan Meier survival curve was created to determine the feasibility of long term treatment with IDI of BTXA.

RESULTS

20 CYP's (8 female and 12 male) were identified from discharge summaries of the SCIC. The mean current age is 16.6 years (2-26 years), with mean age at injury 8.35 years (0-15 years) and mean time since injury 7.85 years (2-20 years). The aetiology, impairment and bladder management is shown in Table 1. IDI of BTXA were administered through a paediatric cystoscope under general anaesthesia. Onabotulinum toxin type A (50-300 units) and abobotulinum toxin type A (200-750 units) were used based on child's weight and previous efficacy. The injections were distributed equally around the bladder avoiding the trigone. The mean age at first injection was 11.25 years (6-19 years). The mean number of repeat injections to date is 3.85 (1-12). The outcome for each patient based on last clinic letter is described in Table 1. The maximum follow up is 120 months

INTERPRETATION OF RESULTS

The initial results (after 1 or 2 injections) were satisfactory for the majority of the patients based on urodynamics results and patient reporting. Three patients were not re-treated after the first injections either due to inefficacy or patient choice. A further 2 discontinued treatment after 2-5 injections. Patients who have received more than 5 repeat injections reported decreasing efficacy of treatment with shorter duration of effect and increased incontinence. This was more apparent in the patients who manage their bladder with intermittent catheterisation (IC) compared to a supra-pubic catheter (SPC). In patients who have received more than 5 repeat injections, the dose has gradually increased to the maximum permitted dose, and the frequency of injection has increased from annually to every 6 months. 2 patients who have had more than 5 repeated injections have been offered bladder reconstruction surgery due to inefficacy of IDI of BTXA; a further 3 patients are continuing with IDI of BTXA but report reduced duration of effect. The 2 patients who have received more than 10 injections both reported that the treatment has reduced duration of effect with increased incontinence and smaller capacity. One (performing IC) has been offered bladder augmentation (ileocystoplasty) and one (using SPC) is continuing but at the highest dose, and more frequent intervals. The Kaplan Meier survival graph for patients continuing with treatment is shown in Figure 1.

CONCLUDING MESSAGE

Intra-detrusor injections of botulinum toxin type A are effective in the short term in children and young people with NDO after SCI. However, we have shown in this study that the duration of efficacy appears to diminish with repeated injections suggesting that this treatment may not provide a long term solution to NDO.

This retrospective study has also highlighted the need for further prospective studies which can quantify outcome measures at specified time intervals to evaluate the efficacy and duration of effect of repeated IDI of BTXA

FIGURE 1

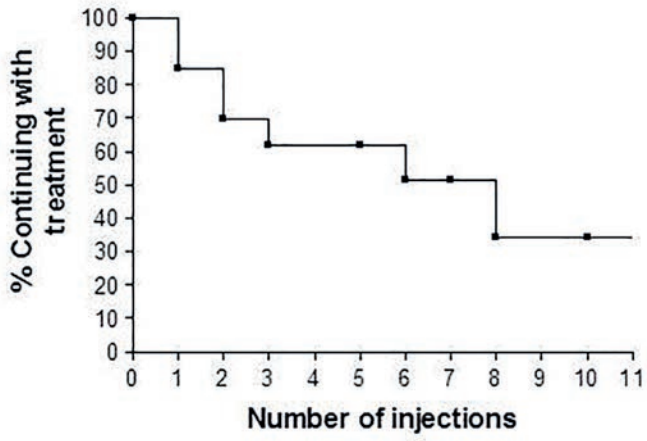

FIGURE 2

Aetiology		Bladder Management		
Transverse Myelitis	7	Suprapubic catheter (SPC)	4	
Spinal surgery	3	Intermittent catheterisation (IC)	13	
Spinal Tumour	3	Voiding on urge	1	
RTA	3	Voiding and self- catheterising	1	
Fall	1			
Spinal haematoma	1	**Impairment**	**Complete**	**Incomplete**
Meningoencephalitis	1	Cervical	2	2
Neurofibratomatosis	1	Thoracic	7	9

	Total Number of Patients			
Repeat Injections	**1**	**2-5**	**>5**	**>10**
Clinical Outcome	*9*	*4*	*5*	*2*
No follow up yet as recent injections	2			
Discontinued treatment	3	2		
Continuing treatment	2	1		
Continuing treatment but no longer as effective			3	1
Offered reconstruction			2	1
Lost to follow up	1	1		

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** RETROSPECTIVE STUDY **Helsinki** not Req'd RETROSPECTIVE STUDY **Informed Consent** No

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ONABOTULINUMTOXINA AMELIORATES AUTONOMIC DYSREFLEXIA WHILE IMPROVING LOWER URINARY TRACT FUNCTION AND QUALITY OF LIFE IN INDIVIDUALS WITH SPINAL CORD INJURY

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HYPOTHESIS / AIMS OF STUDY

Management of neurogenic lower urinary tract dysfunction is among the highest priorities for individuals with spinal

cord injury (SCI). Neurogenic detrusor overactivity (NDO) not only results in urinary incontinence but is also a risk factor for urinary tract infection (UTI) and long-term renal dysfunction.

Furthermore, it is a leading cause of sudden increases in systolic blood pressure (BP), i.e. autonomic dysreflexia (AD). The latter is defined according to the International Standards to document remaining Autonomic Function after SCI as an increase in SBP ≥20mmHg from baseline due to a noxious or innocuous stimuli from below the level of injury.[1]

Both NDO and AD combine to place a tremendous burden on individuals with SCI. We hypothesize that by treating NDO, thereby reducing the frequency and severity of AD, quality of life (QoL) in this population can be improved.

STUDY DESIGN, MATERIALS AND METHODS

This is a prospective, open-label study to assess the efficacy of onabotulinumtoxinA to reduce AD in individuals following SCI. The University of British Columbia Research Ethics Boards approved this study. This study has been registered at clinicaltrials.gov (NCT02298660).

Individuals with chronic (1-year post injury), traumatic SCI at or above the level of spinal segment T6 suffering from AD and NDO following SCI were assessed at baseline (i.e. screening for eligibility, #1) and one month post-treatment (#2).

All individuals underwent intradetrusor onabotulinumtoxinA injections (200 IU) to treat NDO. Assessments included urodynamics, 24-hour ambulatory blood pressure (BP) monitoring and two validated, standardized questionnaires, i.e. incontinence QoL (I-QoL) and AD health-related QoL (AD HR QoL). The I-QoL comprise 22 items over three domains, i.e. avoidance and limiting behaviour (ALB), psychosocial impacts (PSI) and social embarrassment (SE). Each item can have a value on a 5-point scale from 1 (extremely) to 5 (not at all). The AD HR QoL utilizes symptoms characteristics of AD to subjectively score frequency and severity of AD episodes on a daily basis and upon bladder filling. Changes in BP and heart rate were recorded during urodynamic investigations to capture artificially induced AD. The 24-hour ambulatory BP monitoring was applied to detect spontaneous episodes of AD.

Complications post-treatment were monitored and documented using the Clavien-Dindo (CD) classification of surgical complications.

RESULTS

Overall, 35 individuals (Table 1) completed this study.

Objectively, onabotulinumtoxinA improved lower urinary tract function resulting in an increased cystometric capacity (from 339±217 to 519±212mL, $p<0.001$). Thus, onabotulinumtoxinA decreased maximum detrusor pressure during bladder filling (from 46±27 to 17±10cmH2O, $p=0.018$). Moreover, onabotulinumtoxinA reduced severity of artificially induced AD during UDS#2 (ΔSBP from 48±25 to 35±30mmHg, $p=0.008$) as well as frequency (from 15±12 to 10±9, $p=0.02$) and severity (ΔSBP from 60±31 to 42±18mmHg, $p<0.001$) of spontaneous AD in daily life (ABPM#2).

Subjectively, a significant ($p<0.001$) improvement in incontinence-related QoL one month post-treatment was seen across all three domains, i.e. ALB (from 26±7 to 32±6), PSI (from 29±10 to 37±9), SE (from 14±6 to 18±6), and total (from 68±21 to 86±20) compared to baseline assessment. Frequency of AD on a daily basis (from 12±5 to 8±5, $p<0.001$) and upon bladder filling (from 11±5 to 7±6, $p<0.001$) as well as severity of AD on a daily basis (from 8±4 to 6±5, $p=0.02$) and upon bladder filling (from 8±5 to 5±5, $p<0.001$) were significantly decreased one month post-treatment.

Only minor complications, i.e. CD I or II occurred in 20 or 6 participants, respectively.

INTERPRETATION OF RESULTS

Our data supports that onabotulinumtoxinA significantly ameliorates AD (i.e. during UDS and in daily life) in individuals with SCI. Thus, onabotulinumtoxinA not only is a successfull second-line NDO treatment option but provides a substantial capacity to reduces AD-related long-term cardiovascular consequences in individuals living with spinal cord injury.

CONCLUDING MESSAGE

OnabotulinumtoxinA not only reduces the frequency and severity of AD safely but also improves QoL for individuals living with SCI significantly.

FIGURE 1

Characteristics	n = 35
Age in years ± SD (range)	42 ± 10 (22 – 62)
Duration since SCI in years ± SD (range)	15 ± 12 (1 – 42)
Sex	
Male / Female	27 / 8
Level of SCI	
Cervical (C1-C8) / Thoracic (T1-T6)	24 / 11
AISA Impairment Scale	
A / B / C / D	19 / 12 / 3 / 1

Abbreviation: AISA, American Spinal Cord Injury Association; SCI, Spinal Cord Injury; SD, Standard Deviation

REFERENCES

1. Krassioukov A, Biering-Sorensen F, Donovan W, et al. International standards to document remaining autonomic function after spinal cord injury. The journal of spinal cord medicine 2012;35(4):201-10.

Funding Michael Smith Foundation for Health Research (MSFHR) and Rick Hansen Foundation (RHF) supported Matthias Walter as a postdoctoral research trainee for this study (Grant ID 17110). The Rick Hansen Institute and the Canadian Foundation for Innovation supperted this study. Allergan provided a Grant-in-aid for this study including the study drug. **Clinical Trial** Yes **Registration Number** www.clinicaltrials.gov (NCT02298660) **RCT** No **Subjects** Human **Ethics Committee** The University of British Columbia Research Ethics Boards approved this study. **Helsinki** Yes **Informed Consent** Yes

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EFFECT OF GESTATIONAL DIABETES MELLITUS ON PELVIC FLOOR MUSCLE FUNCTION: THREE-DIMENSIONAL ULTRASOUND

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HYPOTHESIS / AIMS OF STUDY

A few studies have reported anatomical changes in levator hiatal dimensions by 3D transperineal ultrasound through gestation,15,17 but to date, there is a lack of longitudinal studies monitoring the changes in contractility and distensibility of PFM . In addition, these studies did not investigate the influence of maternal hyperglycemic environment on changes of PFM function just before the GDM diagnosis and throughout gestation. Therefore the aim of this study was To investigate the effect of gestational diabetes mellitus (GDM) on pelvic floor muscle (PFM) contractility and distensibility at two-time points of pregnancy by transperineal three-dimensional (3D) ultrasound.

STUDY DESIGN, MATERIALS AND METHODS

Prospective cohort study conducted between 2015 and 2016 was approved by the Research Ethics Committee of the Institution (Protocol Number 972.104). After the knowledge of all procedures a written informed consent was obtained from all subjects. Helsinki Declaration on human experimentation guidelines was respected.

The inclusion criteria were pregnant women in their first or second pregnancy with previous elective Cesarean-section, 18-40 years of age, singleton pregnancy and GDM or normoglycemia diagnosis.18 The exclusion criteria were previous Diabetes Mellitus (type I or II or overt diabetes), multiple pregnancy, previous history of labor during the first pregnancy and/or previous vaginal delivery, prolapse or antiincontinence surgery, PFM training before or during pregnancy, connective tissue diseases, neurological disorders, fail to perform appropriately the sequence and correct mode of PFM contraction and Valsalva maneuver, and inability to perform a maximal Valsalva maneuver for cardiac or pulmonary disease.

The sample size calculation was performed using results from a pilot study in which 35 pregnant women normoglycemic and 35 women with GDM were required to detect a 5% change in levator hiatal area (LHarea) with a two sided α of 0.05 and a power of 80%. We included 44 GDM women (GDM group) and 60 normoglycemic pregnant women (NG group) at 24-30 weeks of gestation to preserve the power, taking into account the possibility of women dropout.

Personal, clinical, Obstetric and anthropometric data was collected. Transperineal 3D ultrasound was performed at two-time points , between 24-30 weeks of gestation and 36-40 weeks of gestation, in the supine lithotomy position after voiding, using the GE Voluson "I" system with RAB 2-6RS(2-6 MHz) curved array 3D transducer (GE Healthcare, Zipf, Austria). The field of view angle was set to its maximum of 70° in the sagittal plane and 85° in the coronal plane.16,19 Imaging data sets were taken at rest, during maximal voluntary PFM contraction and during maximal Valsalva maneuver by a trained and experient investigator (CISF) in transperineal 3D ultrasound and differentiated by colors. The images at rest were acquired only as a basal measure to calculate the function index variables.

The ultrasonographic images were stored offline by anonymous code numbers. Analysis of the LH dimensions were carried out using 4D View – version 14 Ext 3 (GE Healthcare) software program and all data sets were analyzed in random order, which was blinded to all participant data. All measurements of the LH area were determined in the axial plane of minimal hiatal dimensions, identified in the mid-sagittal image as the minimal distance between the inferior margin of symphysis pubis and the anorectal junction, using render mode. Volume rendering is a technique used to display a two-dimensional projection of a 3D structure. 27 The area of the LH (LHarea) in cm2.

RESULTS

A total of 83 participants were included in the final analysis, 38 in GDM group and 45 in NG group. Table 1 shows baseline variables. Table 2 compares Absolute Values at 24-30 Weeks of Gestation and 36-40 Weeks of Gestation and on Gestational Progress of Levator Hiatal Area.

INTERPRETATION OF RESULTS

A new and interesting finding of our study is that GDM had negative impact on PFM with decrease in contractility, distensibility and mobility. Analysis of our results showed a weak muscle at 24-30 weeks of gestation, demonstrated by a larger LHarea during contraction, meaning a less muscle contractility. The increase of these dimensions during contraction is inversely proportional to contractile function capacity of the muscle. A soft muscle was identified at 24-30 weeks of gestation, showed by a larger LHarea on distension and although this distension has been considered a physiological adaptation in pregnancy, in GDM group it was deeper. At 36-40 weeks of gestation we found a smaller LHarea during distension characterizing a stiff muscle with less muscle distensibility.

CONCLUDING MESSAGE

In conclusion, based on these results, we identified that GDM have a relevant impact on pelvic floor function detected by 3D ultrasound , characterized by decrease in contractility, distensibility from 24-30 to 36-40 weeks of gestation

FIGURE 1

Table 2. Comparison of Absolute Values at 24-30 Weeks of Gestation and 36-40 Weeks of Gestation and on Gestational Progress of Levator Hiatal (LH) Dimensions and Between Gestational Diabetes Mellitus (GDM) Group and Normoglycemic (NG) Group.

	24 -30 weeks of gestation			36-40 weeks of gestation		
Variable	GDM (38)	NG (45)	P*	GDM (38)	NG(45)	P*
Contraction						
LHarea (cm^2)	11.7 (7.6-16.5)	10.7 (7.3-15.4)	.029	12.7 (9.6-17.8)	11.5 (8.1-16.9)	.021
Distension						
LHarea (cm^2)	16.8 (13.2-22.1)	15.1 (8.9-21.8)	<.001	14.9 (11.9-19.5)	17.2 (10.6-22.7)	.000

LHarea, levator hiatal area.
Distension was performed by Valsalva maneuver.
Data are the median (minimum, maximum).
* Based on Mann–Whitney U test.

FIGURE 2

Table 1. Baseline Variables of the Study Population

Variable	NG (n=45)		GDM (n=38)		P*
Previous Cesarean-section[1]	14 (33%)		11 (29%)		.668
Age (years)[1]	29.00	(18.00-39.00)	28.00	(18.00-40.00)	.912
BMI (kg/m^2) [1]	25.10	(18.00-37.20)	27.20	(17.70-37.00)	.079
Gestational age[1]	26.90	(24.70-30.00)	26.50	(24.70-30.00)	.426
Maternal weight gain (kg) [2]	9.10	(0.50-24.80)	7.40	(-0.20-21.90)	.187
Blood Glucose (mg/dL)[1]	78.00	(64.00-92.00)	85.00	(72.00-99.00)	<.001
OGTT (mmol/L) - fasting[1]	74.00	(58.00-85.00)	85.00	(69.00-163.00)	<.001
OGTT - 1h (mmol/L)[1]	108.00	(58.00-163.00)	160.00	(88.00-213.00)	<.001
OGTT - 2h (mmol/L)[1]	101.00	(58.00-135.00)	144.00	(72.00-189.00)	<.001

NG, normoglycemic group; GDM, gestational diabetes mellitus group; BMI, body mass index; OGTT, oral glucose tolerance test.
[1] Evaluation at 24-30 weeks gestation.
[2] Evaluation at 36-40 weeks gestation.
Data are the median (minimum, maximum) or n (%).
* Based on Mann–Whitney U and Chi-square test.

Funding Grant #2016/01743-5 , São Paulo Research Foundation (FAPESP)/Brazil. **Clinical Trial** No **Subjects** Human **Ethics Committee** Research **Ethics Committee** of Botucatu Medical School - UNESP (CAAE 40418215.8.0000.5411). **Helsinki** Yes **Informed Consent** Yes

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SILDENAFIL, A PHOSPHODIESTERASE TYPE 5 INHIBITOR, AUGMENTS BLADDER AFFERENT ACTIVITY IN MOUSE.

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HYPOTHESIS / AIMS OF STUDY

Several clinical studies have shown that phosphodiesterase type 5 inhibitors (PDE5-I) improve male lower urinary tract symptoms (LUTS), including both storage and voiding components, without the impairment of sexual function seen with other BPH/LUTS treatments. However, none of these studies showed an improvement in peak urinary flow rate, raising the question of how they act to improve LUTS. Recently, we have reported an in situ voiding mouse model, the decerebrate arterially-perfused mouse (DAPM), allowing assessment of lower urinary tract (LUT) function of mice without the confounding effects of anaesthesia [1]. This has many of the advantages of accessibility afforded by in vitro approaches but retains functional neural connectivity. Using this approach, we showed that low doses of the PDE5-I, sildenafil, at subnanomolar concentrations, increased bladder compliance by directly relaxing the bladder [2]. Interestingly, sildenafil strikingly increased the number of bursts of external urethral sphincter (EUS) activity per void (to 130.1 ± 6.9 % of control at 30pM). This follow-on study aimed to investigate the influence of sildenafil on mouse bladder afferent activity in situ, lumbosacral spinal cord in vivo and electrical field stimulation (EFS)-induced contractions of EUS in vitro to determine the mechanisms underlying the increased bursting activity of EUS.

STUDY DESIGN, MATERIALS AND METHODS

Adult CD1 male mice were decerebrated and arterially perfused with a carbogenated Ringer's solution to establish the DAPM. To allow distinction between central neural and peripheral actions of sildenafil, recordings of the pelvic nerve were conducted in a 'pithed' DAPM which has no central nervous system or spinal cord. The nerve was identified, cut and recordings were made from the distal end with a suction electrode. A polyethylene catheter (PE-50, Clay-Adams, Parsippany, NJ, USA) was sutured into the dome of bladder. Bladder distention-induced pelvic neural activity which increased exponentially over the range of pressures normally associated with the micturition cycle (<15mmHg). Nerve activity was AC amplified (5-10k), band pass filtered (100 Hz to 3 kHz) and digitised at 10Khz. Multifibre afferent nerve activity was quantified by thresholding to count the number of action potentials (Spike2, CED, Cambridge, UK). After clamping the urethra, saline was infused (25ul/min) until the intra-vesical pressure reached 15mmHg (filling phase) and then the infusion was stopped for 3 minutes (isovolumetric phase) (Figure 1A). At the end of each cycle the bladder was emptied by aspiration.

To investigate the action of sildenafil on the lumbosacral spinal cord, sildenafil was intrathecally injected to urethane anaesthetized mice (1.0-1.2 mg/g i.p). To allow intrathecal access, the vertebral spines (L4 – L6) were exposed through a midline skin incision. To allow EUS-electromyography (EMG), stainless steel insulated wires (0.075mm, diameter) were inserted into the sphincter muscle percutaneously. The bladder was cannulated with PE-50 catheter to monitor the intra-vesical pressure. The bladder was filled (at 25ul/min) and once a stable pattern of micturition was established, baseline cystometric parameters were measured (more than 4 micturition cycles). Sildenafil was administered intrathecally (final concentration of 30 and 300pM, each in 5ul – assuming an intrathecal volume of 20uL) and CMG parameters and EUS-EMG activity were monitored.

Mice were euthanised by cervical dislocation and the whole EUS was removed through a midline laparotomy. The whole EUS (with internal urethral sphincter and urethra intact, approximately 10 mm length, 3 mm width) were tied to an isometric force transducer in a perfusion trough, and superfused longitudinally with Tyrode's solution at 37°C. Nerve-mediated tetanic contractions were generated by electrical field stimulation (EFS) (0.1 ms pulses, 40 Hz, 3-s train). The amplitude of peak force of contractions and area under the curve (AUC) were normalised for tissue preparation weight (mN / g). After sildenafil (10 and 30pM) and sodium nitroprusside (SNP 100uM) application, EFS were repeated.

RESULTS

Sildenafil (10 and 30 pM) produced an increase in pelvic afferent activity during the filling (from 16.1 ± 5.1 Hz at baseline to 23.0 ± 5.2 Hz at 30pM at 15mmHg, P=0.020, n=9) and during the isovolumetric phase (to 205.4 ± 30.2 % of control at 30pM, P=0.034, n=9) (Figure 1B). The vehicle control showed no change in pelvic afferent activity (n=9). Intrathecal application of sildenafil (5ul, 30 and 300 pM) did not alter cystometry and EUS-EMG parameters in urethane anaesthetised mice (n=5). EFS (40Hz) induced tetanic contractions of EUS. Sildenafil (10 and 30 pM) did not alter maximum amplitude (124.5 ± 28.2 mN / g at baseline) and AUC (424.4 ± 110.1 mN.sec / g at baseline)) of the tetanic contractions of whole EUS induced by EFS (n=6). In contrast, a control experiment with the NO donor SNP (100uM) reduced the tetanic contractions of whole EUS at maximum amplitude (to 66.1 ± 6.3 % of baseline, P=0.014) and AUC (to 53.9 ± 9.1 % of baseline, P=0.014).

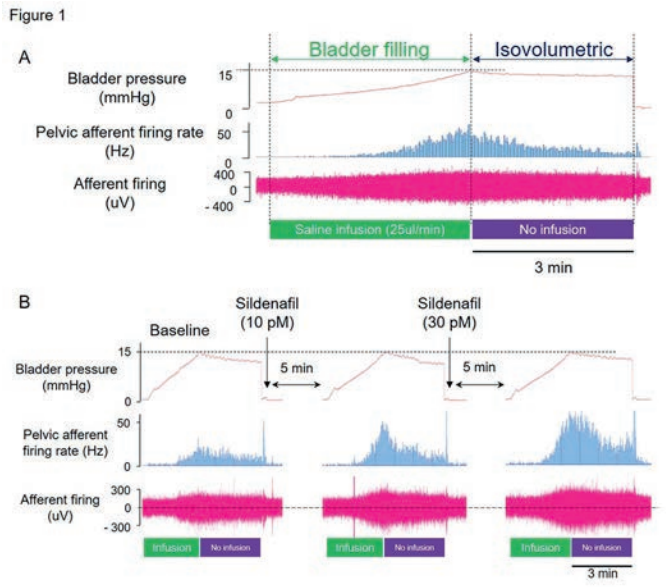
INTERPRETATION OF RESULTS

We propose that the increased afferent activity produced by sildenafil in the normal range of micturition pressures (& bladder distension) might facilitate better co-ordination of bladder and sphincter function. It is known that external urethral sphincter motor neurons can be activated via segmental afferents, and some studies in rats and cats showed that electrical stimulation of pelvic afferents elicited reflex firing in pudendal nerve efferents or the external urethral sphincter [3]. Although these studies used rats and cats not mice, the augmented bladder afferent activity we have observed might increase the EUS-EMG bursting in DAPM after sildenafil.

CONCLUDING MESSAGE

Sildenafil acts at picomolar concentrations to increase pelvic nerve afferent activity and then augment the bursting activity of the external urethral sphincter. We propose that these novel actions may underlie some of its beneficial activity in LUT dysfunction.

FIGURE 1



REFERENCES

1. Ito H, Drake MJ, Fry CH, Kanai AJ, Pickering AE. Characterization of mouse neuro-urological dynamics in a novel decerebrate arterially perfused mouse (DAPM) preparation. Neurourol Urodyn. 2018 Jan 15. [Epub ahead of print]
2. Ito H, Drake MJ, Kanai AJ, Fry CH, Pickering AE. Effects of Sildenafil on bladder and urethral function in a novel voiding mouse model: The decerebrate arterially-perfused mouse (DAPM) preparation. Moderated poster, 47th Annual meeting of International Continence Society (ICS) 2017 in Florence
3. Thor KB, de Groat WC. Neural control of the female urethral and anal rhabdosphincters and pelvic floor muscles. Am J Physiol Regul Integr Comp Physiol. 2010;299:R416-38.

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CENTRAL ANGIOTENSIN II INDUCES FREQUENT URINATION THROUGH INHIBITION OF GABAERGIC NERVOUS SYSTEM AND STIMULATION OF ANGIOTENSIN II TYPE 1 RECEPTOR DOWNSTREAM SIGNALING IN RATS

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HYPOTHESIS / AIMS OF STUDY

Psychological stress plays an important role in the development of lower urinary tract symptoms. However, the pathophysiological mechanism of psychological stress-induced frequent urination is not well understood [1]. Psychological stress increases the levels of angiotensin II (Ang II), a stress-related neuropeptide in the brain [1]. Our previous report showed that involvement of brain γ-aminobutyric acid (GABA)A receptor for central Ang II-induced frequent urination in rats. Moreover, central Ang II induces frequent urination by acting on the Ang II type 1 (AT1) receptor in the brain [1]. In this study, we further investigated the pathophysiological mechanism by which central Ang II induced frequent urination focusing on the GABAergic nervous system and AT1 receptor downstream signaling pathway.

STUDY DESIGN, MATERIALS AND METHODS

Male Wistar rats (330-440 g) were anesthetized with urethane (1.0 g/kg, ip), and a catheter was then inserted into the bladder dome to perform continuous cystometry (12 ml/h saline infusion). Three hours after the surgery, each drug was centrally administered into the right ventricle.

Study 1: Vehicle 1 (sterile phosphate buffer saline/3 μL/rat), muscimol (GABAA receptor agonist, 100, 300 or 1,000 pmol/rat) or baclofen (a GABAB receptor agonist, 30, 100 or 300 pmol/rat) was intracerebroventricularly (icv) administered. Vehicle 1, muscimol (100, 300 pmol/rat) or baclofen (30 or 100 pmol/rat) was icv pre-treated 30 min before icv Ang II (30 pmol/3 μL/rat) administration.

Study 2: Vehicle 2 [sterile 10% N,N-dimethylmethanamide (DMF)/3 μL/rat], telmisartan (an AT1 receptor antagonist, 3 or 10 nmol/rat), valsartan (an AT1 receptor antagonist, 10 nmol/rat), PD123319 (an Ang II type 2 receptor antagonist, 100 nmol/rat), U-73122 [a phospholipase C (PLC) inhibitor, 300 or 1000 pmol/rat] or chelerythrine chloride [a protein kinase C (PKC) inhibitor, 300 or 1,000 pmol/rat] was icv pre-treated 30 min before icv Ang II (30 pmol/3 μL/rat) administration.

Study 3: Vehicle 3 (sterile 10% DMF/5 μL/rat), apocynin [a nicotinamide adenine dinucleotide phosphate oxidase (NOX) inhibitor, 20 or 200 nmol/rat], or tempol (an anti-oxidant, 2 or 20 nmol/rat) was icv pre-treated 30 min before icv Ang II (30 pmol/rat) administration.

The intercontraction interval (ICI) and maximum voiding pressure (MVP) were evaluated 20 min before and after the central Ang II administration (0 to 60 min) (n = 5-7).

RESULTS

A centrally administered highest dose of muscimol (1,000 pmol/rat) or baclofen (300 pmol/rat) significantly extended the ICI for 0-60 min, compared with Vehicle 1 treatment without altering the MVP (Figure 1A and 1B). Centrally administered Ang II significantly shortened the ICI for 0-60 min after the injection compared to the value before central Ang II administration (-20-0 min) (data not shown). On the other hand, central pre-treatment with muscimol (300 pmol/rat) or baclofen (100 pmol/rat) alone which each dose of the drugs did not affect ICI, and significantly suppressed central Ang II-induced shortening of the ICI for 0-60 min after central Ang II administration, compared with Vehicle 1 pre-treatment (Figure 1C). Central pre-treatment with telmisartan, valsartan, U-73122 or chelerythrine chloride but not PD123319 suppressed central Ang II-induced shortening of the ICI in a dose-dependent manner compared with Vehicle 2 pre-treatment (Figure 2A and 2B). Moreover, central pre-treatment with apocynin or tempol significantly suppressed central Ang II-induced shortening of the ICI in a dose-dependent manner compared with Vehicle 3 pre-treatment (Figure 2C).

INTERPRETATION OF RESULTS

The GABAergic nervous system is known to modulate micturition [1]. Current data showed that a centrally administered highest dose of muscimol or baclofen extended the micturition interval. Thus, stimulating the GABAergic nervous system could inhibit micturition. Central pre-treatment with muscimol or baclofen suppressed central Ang II-induced shortening of the ICI. A previous study demonstrated that central Ang II-induced stimulation of AT1 receptors suppressed GABA release in the periaqueductal gray [2]. These data support a previous report [1] and suggested that central Ang II can induce frequent urination via inhibition of the GABAergic nervous system in rats. Moreover, Ang II is known to activate the canonical Gq protein/PLC/PKC signaling and NOX in various tissues through stimulation of the AT1 receptor [3]. Current data demonstrated that central pre-treatment with telmisartan, valsartan, U-73122, chelerythrine chloride, apocynin, or tempol in a dose-dependent manner inhibited central Ang II-induced shortening of the ICI. These data suggested that central AT1 receptor downstream signaling (PLC/PKC/NOX/super oxide anion) is involved in central Ang II-induced frequent urination.

CONCLUDING MESSAGE

Central Ang II induces frequent urination through the inhibition of the GABAergic nervous system and activation of AT1 receptor/PLC/PKC/NOX/superoxide anion pathways in rats. The central AT1 receptor might be a possible therapeutic target against psychological stress-induced frequent urination.

FIGURE 1

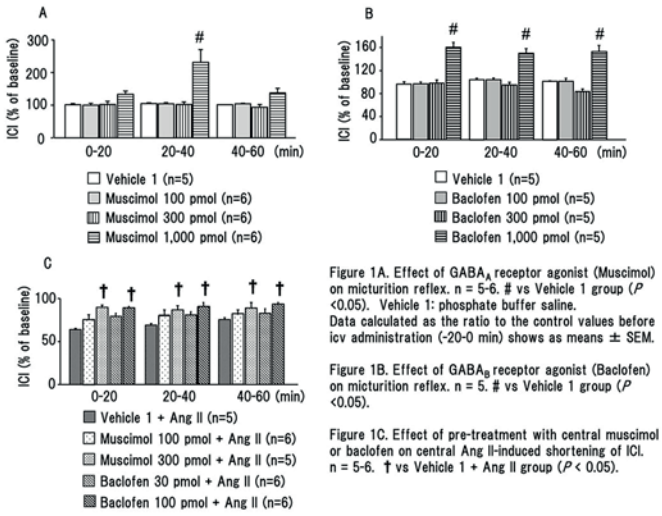

Figure 1A. Effect of $GABA_A$ receptor agonist (Muscimol) on micturition reflex. n = 5-6. # vs Vehicle 1 group (P <0.05). Vehicle 1: phosphate buffer saline. Data calculated as the ratio to the control values before icv administration (-20-0 min) shows as means ± SEM.

Figure 1B. Effect of $GABA_B$ receptor agonist (Baclofen) on micturition reflex. n = 5. # vs Vehicle 1 group (P <0.05).

Figure 1C. Effect of pre-treatment with central muscimol or baclofen on central Ang II-induced shortening of ICI. n = 5-6. † vs Vehicle 1 + Ang II group (P < 0.05).

FIGURE 2

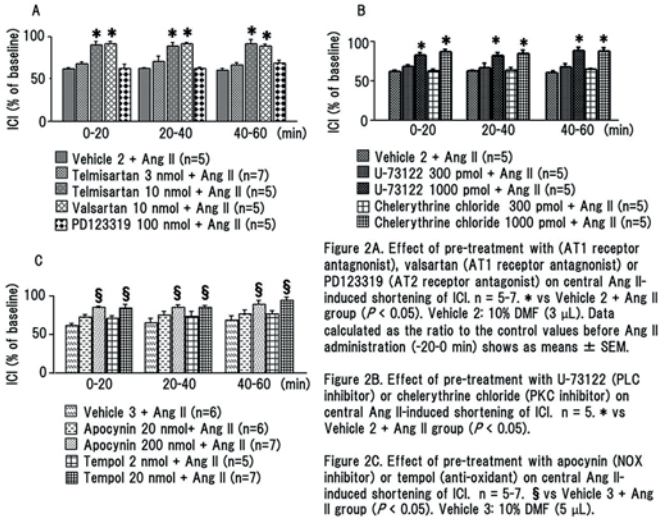

Figure 2A. Effect of pre-treatment with (AT1 receptor antagonist), valsartan (AT1 receptor antagonist) or PD123319 (AT2 receptor antagonist) on central Ang II-induced shortening of ICI. n = 5-7. * vs Vehicle 2 + Ang II group (P < 0.05). Vehicle 2: 10% DMF (3 μL). Data calculated as the ratio to the control values before Ang II administration (-20-0 min) shows as means ± SEM.

Figure 2B. Effect of pre-treatment with U-73122 (PLC inhibitor) or chelerythrine chloride (PKC inhibitor) on central Ang II-induced shortening of ICI. n = 5. * vs Vehicle 2 + Ang II group (P < 0.05).

Figure 2C. Effect of pre-treatment with apocynin (NOX inhibitor) or tempol (anti-oxidant) on central Ang II-induced shortening of ICI. n = 5-7. § vs Vehicle 3 + Ang II group (P < 0.05). Vehicle 3: 10% DMF (5 μL).

REFERENCES

1. Shimizu S, Shimizu T, Nakamura K et al. INVOLVEMENT OF BRAIN GABAA RECEPTOR FOR ANGIOTENSIN II-INDUCED FREQUENT URINATION IN THE RAT. Neurourol Urodyn. 2017;36:S485-S486.
2. Xing J, Lu J, Li J et al. Angiotensin II inhibits GABAergic synaptic transmission in dorsolateral periaqueductal gray neurons. Neurosci Lett. 2009;455(1):8-13.
3. Silva J, Pastorello M, Arzola J et al. AT1 receptor and NAD(P)H oxidase mediate angiotensin II-stimulated antioxidant enzymes and mitogen-activated protein kinase activity in the rat hypothalamus. J Renin Angiotensin Aldosterone Syst. 2010;11:234-242.

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EFFECT OF LYSOPHOSPHATIDIC ACID AND ASP6432, A NOVEL TYPE 1 LYSOPHOSPHATIDIC ACID RECEPTOR ANTAGONIST, ON BLADDER STORAGE FUNCTION IN RATS

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HYPOTHESIS / AIMS OF STUDY

Lysophosphatidic acid (LPA) is a phospholipid known to mediate various physiological functions such as smooth muscle contraction, cell proliferation or afferent nerve activation via G-protein-coupled receptors. At the annual meeting last year, we demonstrated a significant role of type 1 LPA receptors (LPA1) in the regulation of urethral tonus in rats and proliferation of human prostate stromal cells induced by LPA, using ASP6432, a novel antagonist for LPA1 (1).

In cultured human bladder smooth muscle cells, LPA and LPA receptors are suggested to be involved in mechanical stretch-induced activation of mitogen-activated protein kinase presumably through LPA1, whose mRNA is predominantly expressed (2). However, the role of LPA and LPA1 in the regulation of urine storage in the bladder has not been investigated in vivo. To elucidate the role of LPA and LPA1 in bladder storage function, we investigated the effect of LPA and ASP6432 on the micturition reflex in conscious rats. We also evaluated the effect of ASP6432 on the nitric oxide (NO) synthase inhibitor L-NG-Nitroarginine methyl ester (L-NAME)-induced decrease in micturition interval (3) in conscious rats.

STUDY DESIGN, MATERIALS AND METHODS

Continuous cystometry was performed in conscious rats. After catheterization into the bladder, animals were confined to Ballman's cages. The bladder catheter was connected to a pressure transducer and a syringe pump via a three-way tap, and a pressure amplifier was connected to the pressure transducer. Saline was continuously infused into the bladder at a rate of 4.2 mL/hr, and the intravesical pressure (IVP) was measured continuously.

In the first series of experiment, LPA was administered by intravenous (iv) infusion (5 mg/3 mL/kg/hr). After confirming the effect of LPA in at least three micturition cycles for around 30 minutes, vehicle (distilled water containing 0.025 mol/L NaOH; 1 mL/kg) or ASP6432 (0.3, 1, 3 and 10 mg/mL/kg) was administered by iv bolus injection at the end of each micturition cycle.

In the second experiment, animals were treated with L-NAME (10 mg/mL/kg, iv bolus). After confirming the effect of L-NAME in at least two micturition cycles for around 30 minutes, vehicle (saline with 5% N,N-dimethylformamide)

or ASP6432 (0.3 and 1 mg/mL/kg) was administered intravenously, and the effect was evaluated for another 30 minutes.

RESULTS

Intravenous infusion of LPA significantly decreased the micturition interval by 47.1%. ASP6432 inhibited the LPA-induced decrease in micturition interval in a dose-dependent manner, with a statistically significant decrease observed at doses of 1 mg/kg and above (Figure 1). LPA and ASP6432 had no significant effect on the maximal IVP during voiding.

Treatment with L-NAME decreased the micturition interval compared to that at baseline. ASP6432 suppressed the L-NAME-induced decrease in micturition frequency.

INTERPRETATION OF RESULTS

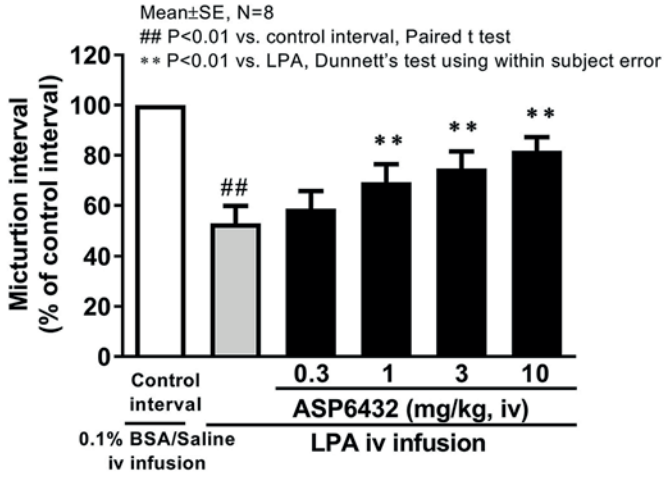
LPA decreased the micturition interval without affecting the maximum IVP, implicating that LPA may negatively affect bladder storage function by modulating the bladder response after stretching (2) or activating afferent nerve activity. The inhibitory effect of ASP6432 on the LPA-induced decrease in micturition interval suggests that LPA1 mediates the LPA-induced increase in micturition frequency.

Intravenous L-NAME treatment in conscious rats decreased the micturition interval, which is consistent with a previous finding that L-NAME induces bladder hyperactivity in conscious rats (3). ASP6432 suppressed the L-NAME-induced increase in micturition frequency, suggesting that inhibition of LPA1 activity can ameliorate bladder overactivity caused by impaired NO production.

CONCLUDING MESSAGE

The present study demonstrates for the first time that LPA can modulate micturition frequency in vivo and that LPA1 is involved in this process. The improved micturition frequency by ASP6432 following L-NAME treatment suggests that LPA1 regulates the micturition reflex via the nitric oxide pathway, and indicates the potential for LPA1 antagonists as novel therapies for the treatment of bladder overactivity associated with benign prostate hyperplasia or overactive bladder.

FIGURE 1



REFERENCES

1. Sakamoto K, Noguchi Y, Ueshima K, Yamakuni H, Ohtake A, Sato S, Ishizu K, Hosogai N, Kawaminami E, Takeda M, Masuda N. The Effect of ASP6432, a Novel Type 1 Lysophosphatidic Acid Receptor Antagonist, on Urethral Function and Prostate Cell Proliferation. Poster presented at: International Continence Society Annual Meeting; 13 September, 2017; Florence, Italy.
2. Kawashima Y, Kushida N, Kokubun S, Ogawa S, Shiomi H, Ishibashi K, Aikawa K, Ikegami K, Nomiya M, Yamaguchi O. Possible effect of lysophosphatidic acid on cell proliferation and involvement of lysophosphatidic acid and lysophosphatidic acid receptors in mechanical stretch-induced mitogen-activated protein kinase. Int J Urol. 2015;22(8):778-84.
3. Persson K, Igawa Y, Mattiasson A, Andersson KE. Effects of inhibition of the L-arginine/nitric oxide pathway in the rat lower urinary tract in vivo and in vitro. Br J Pharmacol. 1992;107(1):178-84.

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INHIBITION OF PHOSPHODIESTERASE TYPE 9 (PDE9) IMPROVES STORAGE AND VOIDING DYSFUNCTION IN MICE WITH SPINAL CORD INJURY

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HYPOTHESIS / AIMS OF STUDY

Chronic spinal cord injury (SCI) rostral to the lumbosacral level induces detrusor overactivity (DO) during the storage phase, which is mediated by spinal reflexes triggered by hyperexcitable C-fiber afferent pathways. During the voiding phase, inefficient voiding is commonly observed due to detrusor-sphincter dyssynergia (DSD) after SCI. It has been shown that phosphodiesterase (PDE) inhibitors, which can modulate cGMP or cAMP levels in tissues, such as PDE type 5 inhibitors have been used for the treatment of lower urinary tract dysfunction (LUTD). PDE type 9 (PDE9) is one of a novel identified isozyme, which is expressed in brain [1], skeletal muscle [2], urinary tract [3]. However, it remains to be elucidated whether PDE9 is involved in LUTD induced by SCI. Therefore, we investigated the effects of a PDE9 inhibitor (PDE9i) to clarify the role of PDE9 in storage and voiding dysfunction using SCI mice.

STUDY DESIGN, MATERIALS AND METHODS

Female C57BL/6N (8-9 weeks old) mice were used, and SCI was induced by complete transection of the Th8/9 spinal cord under isoflurane anesthesia. SCI mice were divided into 2 groups; (1) SCI mice treated with PDE9i (5 mg/kg/day) (n=7), (2) SCI mice with saline (n=5). Two weeks after SCI, PDE9i or saline (treatment or control group, respectively) was administered daily by i.p. injection for 14 days. After spinal cord transection, their bladders were manually squeezed to eliminate urine once daily for 4 weeks until cystometric evaluation. SCI mice were evaluated using single-filling cystometry (CMG) and external urethral sphincter (EUS)-electromyogram (EMG) under an awake condition. In single CMG recordings, the number of non-voiding contractions (NVCs), micturition pressure (MP), post-void residual volume (PVR) and voiding efficiency (VE) were evaluated in each SCI mouse (Figure 1). In simultaneous CMG and EUS-EMG recordings, voiding contraction time, reduced EMG activity duration and the ratio of reduced EMG activity time to voiding contraction time were measured during the voiding phase to evaluate DSD in each SCI mouse. In real-time PCR analyses, L6 dorsal root ganglia (DRG), urethra, bladder mucosa and muscle were removed from saline treated SCI mice (n=8) and PDE9i treated SCI mice (n=8) as well as saline treated normal (spinal intact) mice (n=10), and the levels of PDE9, TRPV1, TNFα and VEGF transcripts were evaluated.

RESULTS

Compared to saline treated SCI mice, NVCs during bladder filling were significantly reduced (Figure 1), and voiding efficiency was significantly improved with reduced residual urine in PDE9i treated SCI mice (Figure 2). In CMG and EUS-EMG recordings, the duration of reduced EMG activity or the ratio of reduced EMG activity time to voiding contraction time during the voiding phase was significantly increased between PDE9i treated and saline treated SCI mice. PDE9 transcripts were identified in L6 DRG, urethra and bladder mucosa and muscle. The levels of TRPV1 mRNA in DRG and bladder muscle were increased in SCI mice vs. spinal intact mice, and significantly decreased after PDE9i treatment in SCI mice. The TNFα mRNA levels in urethra, bladder mucosa and muscle were increased in SCI mice vs. spinal intact mice, and significantly decreased after PDE9i treatment in SCI mice. VEGF mRNA levels in DRG, bladder muscle and mucosa were increased in SCI mice vs. spinal intact mice, but not significantly changed after PDE9i treatment in SCI mice (Figure 3).

INTERPRETATION OF RESULTS

The treatment with PDE9i improved DO evident as a decrease in NVCs in association with the reduction of the expression of TRPV1 in L6 DRG, which is predominantly expressed in C-fiber afferent pathways, suggesting that the PDE9 activation is involved in the inflammatory changes in bladder afferent pathways. Also, PDE9i treatment reduced the expression of TNFα in urethra and bladder tissues and also improved inefficient voiding and DSD as shown by decreases in residual urine and EMG activity time in SCI mice. Overall, the results of this study demonstrated that PDE9 significantly contributes to LUTD as well as inflammatory changes in bladder afferent pathways after SCI and that PDE9i can improve SCI-induced voiding and storage dysfunction.

CONCLUDING MESSAGE

PDE9 inhibition improved SCI-induced detrusor overactivity and inefficient voiding, along with significant reductions in C-fiber afferent receptors such as TRPV1 and proinflammatory cytokines such as TNF in mice. Thus, PDE9 could be a therapeutic target for storage and voiding LUTD after SCI.

FIGURE 1

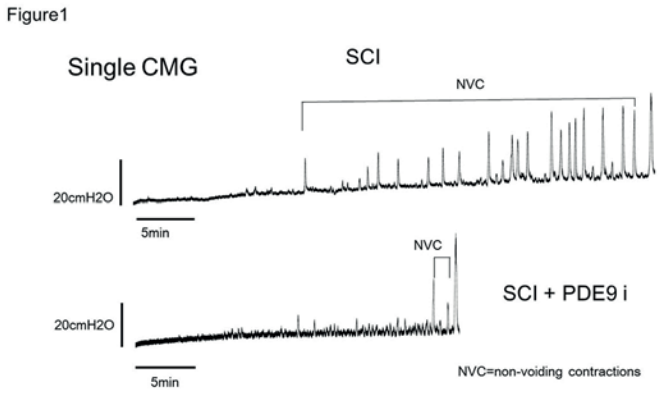
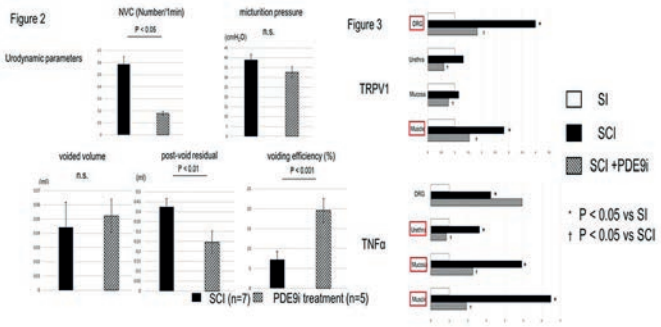


FIGURE 2



REFERENCES

1. J. Neurocytol. 31: 729-741 2002.
2. Can. J. Physiol. Pharmacol. 80: 1132-1135 2002.
3. B.J.U. int. 109: 934-940 2012

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DEVELOPMENT OF AN IN VITRO UROTHELIAL CELL CULTURE MODEL TO STUDY THE EFFECT OF PANNEXIN-1 CHANNEL ON CYTOKINE INDUCED DAMAGE OF UROTHELIAL INTEGRITY

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HYPOTHESIS / AIMS OF STUDY

Interstitial cystitis (IC) is characterised by urinary urgency, frequency, and pain in the bladder and surrounding pelvic regions. A chronic inflammatory response underlies the pathology of IC resulting in the loss of urothelial barrier functions, activation of mast cells, increased ATP release, and release of pro-inflammatory cytokines. A key contributor to inflammation and cell apoptosis is pannexin-1, an ATP release channel [1]. The aim of this study was to develop an in vitro model of cytokine induced urothelial damage. The second aim is to study the protective effect of the pannexin-1 inhibitor, 10Panx1 on the cytokine induced urothelial cell damage

STUDY DESIGN, MATERIALS AND METHODS

Cell culture model of inflammation: Freshly isolated porcine urothelial cells were cultured in RPMI culture media for 8-10 days before being transferred onto transwell inserts. Inflammation and subsequent urothelial cell damage were induced by culture of the porcine urothelial cells with the pro-inflammatory cytokines TNFα and IL-1β (both at 100 ng/mL in DMEM culture media).

The degree of epithelial damage was assessed by measuring the transepithelial electrical resistance (TEER), a measure of electrical resistance across an epithelial monolayer (Figure 1A). TEER is widely used for the study of the integrity and permeability of the epithelial monolayer in the intestine. A reduction in TEER is used to indicate inflammatory damage. TEER of the cultured porcine urothelial cells was measured 4, 24 and 48 hours after the addition of the pro-inflammatory cytokines. The pannexin-1 blocking peptide 10Panx1 (100 μM) was included to examine the protective effects of this agent on the inflammation induced reduction in TEER.

Immunocytochemistry of urothelial cell tight junctions: To determine if the inflammatory cytokines disrupt the urothelial cell tight junctions, immunocytochemistry of zonula occludens-1 (ZO-1) expression was examined. ZO-1 has been previously shown to be decreased in patients with IC [2]. ZO-1immunoreactivity on urothelial cells was examined in the presence and absence of 10Panx1.

RESULTS

Primary porcine urothelial cells after 8-10 days of culture yielded a satisfactory TEER (925 - 2500 Ωcm2). Pre-incubation of urothelial cells with TNFα and IL-β induced a significant reduction of TEER values at both 24 and 48 hrs ($P < 0.01$, $n = 8$, compared to TEER in control cells, Figure 1B), indicating damage to the urothelial barrier. When urothelial cells were exposed to cytokines in the presence of the pannexin-1 channel blocker, 10Panx1, the decrease in TEER values was significantly less than the cytokines only group (Figure 1B).

ZO-1 immunoreactivity (ZO-1-IR) was expressed on urothelial cell membranes and in the cytoplasm (Figure 2A). Treatment of urothelial cells with cytokines for 24 hrs reduced ZO-1-IR and disrupted the tight junction integrity at cell-cell borders (Figure 2B). The damage of urothelial integrity was prevented by the incubation of urothelial cells with 10Panx1 (Figure 2C), as the intensity and cellular distribution pattern of ZO-1-IR in the cells of this group appeared very similar to that seen in control cells.

INTERPRETATION OF RESULTS

The present study has established a novel in vitro model of inflammation using an isolated urothelial cell culture system to study the barrier functions of the urothelium. The results demonstrated a significant increase in the permeability of the urothelial cell monolayer in the presence of TNFα and IL-1β, as indicated by a decrease in TEER measurements. Urothelial cell permeability is increased in IC; therefore, these results suggest a crucial role of cytokines in the pathogenesis of this condition.

TNFα and IL-1β also induced degradation of the tight junction associated protein ZO-1 around the periphery of urothelial cells, indicating that pro-inflammatory cytokines disturb the urothelial permeability barrier by damaging tight junctions.

Perhaps the most important finding of this study was the attenuation of cytokines-induced tight junction disruption and TEER reduction in the presence of 10Panx1.This implies a regulatory role for pannexin-1 in urothelial permeability barrier functions.

CONCLUDING MESSAGE

In conclusion, TNFα and IL-1β can disrupt urothelial tight junctions and increase urothelial permeability. The destructive effect of TNFα and IL-1β was attenuated in the presence of the 10Panx1, which may indicate a role for pannexin-1 channel blockers in the treatment of bladder inflammatory conditions. Similar ATP release channel blockers such as connexin 43 blocking peptides are in clinical trials for reducing inflammation and accelerating wound healing in conditions such as chronic diabetic foot ulcers, and acute corneal wounds [3].

FIGURE 1

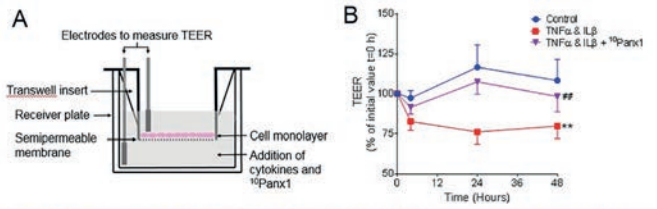

Figure 1. Transepithelial electrical resistance (TEER) in urothelial cells. **A**, the diagram depicts the set-up of urothelial cell monolayer culture on a permeable corning transwell insert and the TEER measurement [3]. **B**, TEER values at each time point were expressed as % of the initial TEER values of individual wells and analysed by two-way ANOVA followed by Sidak test. $^{**}P < 0.01$ compared to the control, $^{\#\#}P < 0.01$ compared to the cytokine treated group.

FIGURE 2

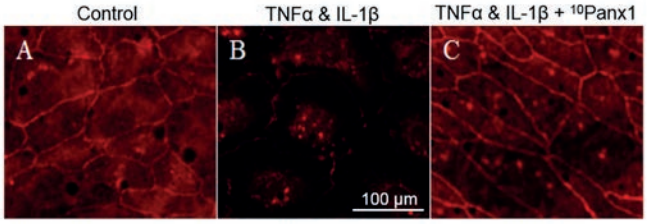

Figure 2. Zonula occludens-1 immunoreactivity in primary cultured porcine urothelial cells.

REFERENCES

1. Adamson & Leitinger (2014). The role of pannexin1 in the induction and resolution of inflammation. FEBS Lett, 588(8), 1416-1422.
2. Lee & Lee (2014). Decreased expression of zonula occludens-1 and occludin in the bladder urothelium of patients with interstitial cystitis/painful bladder syndrome. J Formos Med Assoc, 113(1), 17-22.
3. Grek et al (2015). Topical administration of a connexin43-based peptide augments healing of chronic neuropathic diabetic foot ulcers: A multicenter, randomized trial. Wound Repair Regen 23(2), 203-212.

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INVOLVEMENT OF PIEZO-1 ION CHANNEL IN THE REGULATION OF ACETYLCHOLINE RELEASE IN THE MOUSE URINARY BLADDER

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HYPOTHESIS / AIMS OF STUDY

Urothelial cells have the ability to sense changes in their extracellular environment and respond to various stimuli by releasing numerous neurotransmitters such as ATP and acetylcholine (ACh). Non-neuronal release of ACh from urothelial cells has been demonstrated to play an important role in the urinary bladder physiology and pathophysiology by the activation of cholinergic receptors on urothelial cells, myofibroblasts, detrusor muscle cells and nearby bladder nerves. Currently, anticholinergics have widely been used for overactive bladder treatment, which suggests an essential role of ACh in the aetiology of the bladder overactivity [1]. Characterising mechanisms involved in ACh release in the urinary bladder could be interesting and potentially important as a part of multidrug approach, in the treatment of disorders associated with increased ACh release, particularly in aged patients who exhibit a greater incidence of bladder overactivity. In the present study we aimed to investigate for the first time the role of piezo-1, a mechanosensitive ATP release channel [2], to mediate ACh release in the urinary bladder.

STUDY DESIGN, MATERIALS AND METHODS

Immunohistochemistry was conducted on the cross sections of mouse bladder tissue as well as on cultured urothelial cells using a primary anti-piezo-1 antibody (PA5-72974) and secondary Alexa Fluor488 antibody (ab150077 Abcam) for florescence staining. Isolated urothelial cells were cultured and then transfected after 3 hrs with 10 nM siRNA by using Lipofectamine RNAi MAX (Invitrogen). Piezo-1 expression was measured by immunocytochemistry and quantitative RT-PCR after 48 and 72 hrs of cultivation. Stretch experiments were performed after 72-84 hrs of cultivation using hypotonic solution induced swelling and ACh was measured using an Amplex®Red ACh/acetyl cholinesterase assay kit (Invitrogen, A12217).

RESULTS

RT-PCR revealed abundant piezo-1 mRNA expression in mouse bladder urothelial cells. Piezo-1 immunoreactivity was highly expressed in the cytoplasm and at the plasma membrane of mouse bladder urothelial tissue and in primary cultured urothelial cells (Figure 1 A). Piezo-1 siRNA intervention has reduced piezo-1 mRNA expression and piezo-1 immunoreactivity by ~72% compared to the naïve urothelial cells (Figure 1 A and B).

Hypotonic solution induced swelling triggered a transient ACh release from confluent urothelial cell monolayers, which was consistently maximum at around 10 min. However, ACh release from piezo-1 knock down urothelial cells was significantly reduced at 10 min compared to control siRNA treated and naive urothelial cells. When confluent urothelial cells were pre-incubated with GsMTX4 (5µM) for 1 hr, the amount of stretch-induced ACh release was significantly decreased (Figure 2).

INTERPRETATION OF RESULTS

Piezo-1 has previously been implicated an ATP release channel in different cell types including urothelial cells [2]. This study has established for the first time that piezo-1 channel could play an important role in urothelial derived ACh release in the urinary bladder to mediate various cell functions. Piezo-1 was predominantly expressed in the mouse bladder urothelium and its expression was more prominent in the cytoplasm and on the plasma membrane in cultured urothelial cells which is consistent with the previous reports [2,3]. Augmented ACh release from cultured urothelial cells in response to hypotonic solution induced cell swelling, was significantly reduced in piezo-1 knock down cells, and naive urothelial cells in the presence of piezo-1 channel block-

er GsMTX4. This suggests that piezo-1 channel release ACh upon mechanical stretch in primary urothelial cell cultures and may regulate mechanosensory transduction in the urinary bladder. Pharmacological inhibition of piezo-1 channel in the presence of GsMTX4 may implicate piezo-1 a novel therapeutic drug target that might improve urine storage disorders such as overactive bladder and/or interstitial cystitis.

CONCLUDING MESSAGE

Here, we demonstrated for the first time that piezo-1 channel function as a mechanosensor to regulate the non-neuronal ACh release in mouse bladder urothelium. Based on the findings of the present study it can be concluded that pharmacological inhibition of piezo-1 channel mediated ACh release may contribute to the actions of anti-muscarinic drugs and may lead to development of new therapeutics for the clinical management of lower urinary tract storage disorders.

FIGURE 1

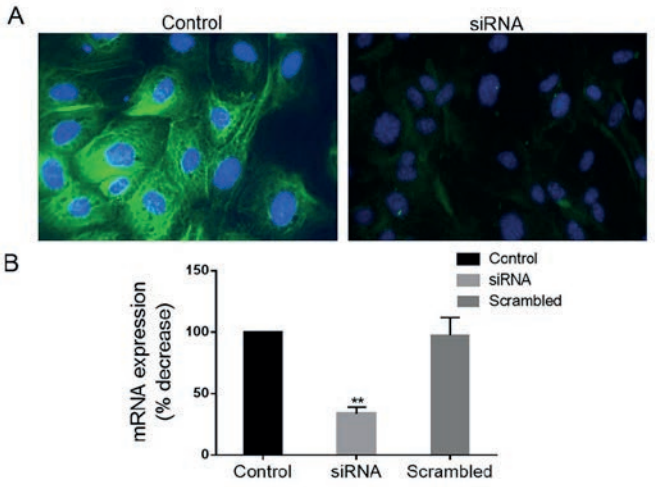

Figure 1. Expression of piezo-1 protein and mRNA expression in mouse bladder urothelial cells

FIGURE 2

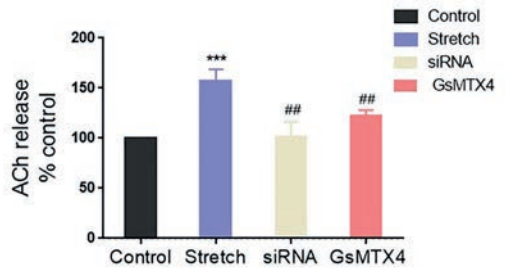

Figure 2. Effect of siRNA mediated knockdown of piezo-1 and GsMTX4 on stretch induced ACh release from cultured urothelial cells. Data were presented as means ± S.E. (error bars). ***, $P \leq 0.001$ compared to control and ##, $P \leq 0.01$ compared to stretch.

REFERENCES

1. Kuteesa et al. (2006). Anticholinergic drugs for overactive bladder. Australian Prescriber, 29(1), 22-4.
2. Miyamoto et al. (2014). Functional role for Piezo1 in stretch-evoked Ca2+ influx and ATP release in urothelial cell cultures. Journal of Biological Chemistry, 289(23), 16565-16575.
3. Michishita et al. (2016). Piezo1 expression increases in rat bladder after partial bladder outlet obstruction. Life sciences, 166, 1-7.

Funding None **Clinical Trial** No **Subjects** Animal **Species** Mouse **Ethics Committee** UOS animal ethics committee

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BRAIN CORTICOTROPIN-RELEASING FACTOR RECEPTOR TYPE 1 IS INVOLVED IN CENTRALLY ADMINISTERED BOMBESIN-INDUCED FREQUENT URINATION IN RATS

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HYPOTHESIS / AIMS OF STUDY

Psychological stess plays an important role in the induction of frequent urination and exacerbation of bladder dysfunction including overactive bladder (OAB) and bladder pain syndrome/interstitial cystitis (BPS/IC). Psychological stress-related information is conveyed to the brain, and then the brain recruits neuronal and neuroendocrine systems for adaptation to stressful conditions. However, the brain pathophysiological mechanisms underlying psychological stress-induced effects on bladder function are still unclear. Recently, we reported that bombesin (BB)-like peptides, which are stress-related neuropeptides, centrally induces facilitation of the rat micturition reflex [1]. Central BB-like peptides are reported to induce activation of the hypothalamo-pituitary-adrenal axis and sympathetic nerves, as representative responses to stressful conditions, through brain corticotropin-releasing factor (CRF) [2], another stress-related neuropeptide. In this study, therefore, we examined whether brain CRF is involved in BB-induced frequent urination in rats.

STUDY DESIGN, MATERIALS AND METHODS

(1) In urethane anesthetized (0.8 g/kg, ip) male Sprague-Dawley (SD) rats (300-350 g), a catheter was inserted into the bladder from the dome to perform cystometry (CMG, 12 ml/h saline infusion). Three hours after the surgery, astressin (a non-selective antagonist of CRF receptors, 1 or 3 nmol/rat, intracerebroventricular [icv]) was administered 60 min before BB administration (0.03 nmol/rat, icv). Saline infusion into the bladder and evaluation of intercontraction intervals (ICI) and maximal voiding pressure (MVP) were started 60 min before the first icv administration.

(2) By using urethane anesthetized (0.8 g/kg, ip) male Wistar rats (300-350 g), similar surgery and CMG experiments described above were performed. Three hours after the surgery, CP154526 (a selective antagonist of CRF receptor type 1 (CRF1 receptor), 3 or 10 nmol/rat, icv) or K41498 (a selective antagonist of CRF receptor type 2 (CRF2 receptor), 10 nmol/rat, icv) was administered 30 min before BB administration (0.03 nmol/rat, icv).

RESULTS

Centrally administered BB significantly reduced ICI compared to pre-treatment values before BB (-10~0 min) (Figs. 1-2) without affecting MVP (data not shown) in both SD and Wistar rats in line with our previous report [1].

(1) Central pretreatment with astressin significantly suppressed the central BB-induced reduction in ICI (Fig. 1). There were no significant effects on the treatment with astressin alone (3 nmol/rat, icv) withoug BB on ICI or MVP (data not shown).

(2) Central pretreatment with CP154526 significantly suppressed the central BB-induced reduction in ICI (Fig. 2A), but K41498 had no significant effect on the central BB-induced response (Fig. 2B). There were no significant effects of the treatment with CP154526 alone (10 nmol/rat, icv) withoug BB on ICI or MVP (data not shown).

INTERPRETATION OF RESULTS

(1) Although we used SD and Wistar rats, centrally administered BB induced similar effects on bladder activity by reducing ICI. Because our previous report confirmed that centrally administered BB reduced single-voided volume and bladder capacity without altering post-voiding residual urine volume or voiding efficiency [1], it is suggested that central BB-like peptides induce frequent urination in rats regardless of their strains (SD or Wistar).

(2) The results of experiments using astressin, CP154526 and K41498 suggest that brain CRF1, but not CRF2, receptors are involved in the brain BB-like peptides-induced frequent urination in rats. CRF1 receptors are highly expressed in the forebrain and amygdala, whereas the expression in the hypothalamus is low under basal conditions but markedly up-regulated by stress exposure [3]. In these brain regions, BB-like peptides are released by stress exposure. Because the hypothalamus, forebrain and amygdala are known to innervate the midbrain periaqueductal gray matter (PAG), a site coordinating activity of the pontine micturition center, brain BB-like peptides might stimulate these pathways to the PAG through CRF1 receptors, thereby inducing frequent urination in stressful conditions. In addition, centrally administered astressin or CP154526 by itself had no effect on ICI or MVP, indicating that endogenous CRF in the brain do not seem to affect bladder function in the normal conditions.

CONCLUDING MESSAGE

Brain BB system is involved in facilitation of the rat micturition reflex through brain CRF1 receptor subtypes. These findings would be useful for understanding the underlying brain mechanisms of psychological stress-related exacerbation of lower urinary tract symptoms in OAB and BPS/IC, for which brain CRF1 receptors could be a new therapeutic target.

FIGURE 1

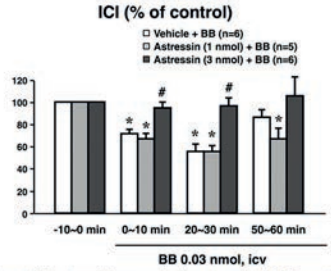

Fig. 1. Effect of central pretreatment with astressin (a non-selective antagonist of CRF receptors) on the centrally administered BB-induced reduction in ICI. *P<0.05, when compared with the Bonferroni method to the pre-treatment of BB (-10~0 min). #P<0.05, when compared with the Bonferroni method to the Vehicle (10 µl of 1% acetic acid in saline/rat) + BB group. Data calculated as the ratio to the pre-treatment of BB (-10~0 min) values present means ± SEM. BB: bombesin; CRF: corticotropin-releasing factor; ICI: intercontraction intervals.

FIGURE 2

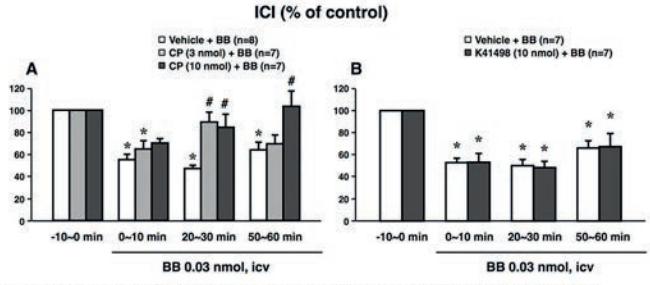

Fig. 2. Effects of central pretreatment with CP154526 (CP, a selective antagonist of CRF1 receptors, A) or K41498 (a selective antagonist of CRF2 receptors, B) on the centrally administered BB-induced reduction in ICI. *P<0.05, when compared with the Bonferroni method to the pre-treatment of BB (-10~0 min). #P<0.05, when compared with the Bonferroni method to the Vehicle + BB group. Vehicle in A was DMF (3 µl/rat), and in B was saline (5 µl/rat). Data calculated as the ratio to the pre-treatment of BB (-10~0 min) values present means ± SEM. BB: bombesin; CRF: corticotropin-releasing factor; ICI: intercontraction intervals.

REFERENCES

1. Shimizu T, Shimizu S, Higashi Y, et al. A stress-related peptide bombesin centrally induces frequent urination through brain bombesin receptor types 1 and 2 in the rat. J Pharmacol Exp Ther. 2016;356:693-701.
2. Kent P, Bédard T, Khan S, et al. Bombesin-induced HPA and sympathetic activation requires CRH receptors. Peptides. 2001;22:57-65.
3. Stengel A, Taché Y. Corticotropin-releasing factor signaling and visceral response to stress. Exp Biol Med (Maywood). 2010;235:1168-1178.

Funding JSPS KAKENHI Grant (#17K09303), Grant from Narishige Neuroscience Research Foundation in Japan, Grant from The Smoking Research Foundation in Japan, NIH Grant (DK088836), Grant from the Department of Defense (W81XWH-12-1-0565) **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** The Kochi University Institutional Animal Care and Use Committee and The Institutional Animal Care and Use Committee at the University of Pittsburgh

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HYDROGEN SULFIDE HAS A ROLE AS AN ENDOGENOUS RELAXATION FACTOR IN THE BLADDER AND PROSTATE OF MALE RATS

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HYPOTHESIS / AIMS OF STUDY

In the lower urinary tract, donors of hydrogen sulfide (H2S), an endogenous gasotransmitter [1], induce contraction of the rat detrusor [2] and relaxation of the pig bladder neck [3]. These reports suggest a possibility that H2S may have site-specific effects on the bladder. However, the detailed functions of H2S in each part of the bladder are still unclear. In addition, there are no reports showing physiological roles of H2S in the prostate.

H2S biosynthesis is mediated by three enzymatic mechanisms: two responsible enzymes for metabolism of L-cysteine, cystathionine β-synthase (CBS) and cystathionine γ-lyase (CSE), and the third mechanism, the combined action of 3-mercaptopyruvate sulfurtransferase (MPST) and cysteine aminotransferase (CAT) [1]. CBS and CSE produce H2S from L-cysteine and L-homocysteine. MPST produces H2S from 3-mercaptopyruvate, which is synthesized from L-cysteine by CAT (MPST/CAT pathway). Recently, D-cysteine can be also a significant substrate for H2S production; it is converted to 3-mercaptopyruvate by D-amino acid oxidase (DAO) (MPST/DAO pathway) [1].

In this study, we investigated (1) tissue distributions of CBS, CSE, MPST, CAT and DAO, (2) endogenous H2S levels, and (3) effects of H2S donors (NaHS and GYY4137) on contractility, in the rat bladder and prostate.

STUDY DESIGN, MATERIALS AND METHODS

Bladder dome and trigone (BL-D and BL-T), dorsolateral and ventral prostate (PR-D and PR-V), liver and cerebellum (L and C) were prepared from male Wistar rats (300-400 g) sacrificed with an overdose of sodium pentobarbital (80 mg/kg, ip).

(1) Tissue distributions of 5 enzymes were investigated by real-time PCR, Western blot and immunohistochemistry. L and C were used for positive controls for real-time PCR, Western blot and immunohistochemistry. (2) H2S contents in the bladder and prostate tissues were measured by methylene blue method. (3) By using 1 x 5 mm strips of the bladder and prostate tissues, effects of NaHS (1 x 10-9 to 3 x 10-4 M) were evaluated on pre-contracted bladder strips by carbachol (10-5 M) and prostate strips by noradrenaline (10-5 M). Prostate strips were pretreated with propranolol (10-6 M) 30 min before the pre-contraction.

In addition, in vivo study was also performed. In urethane anesthetized (0.8 g/kg, ip) male Wistar rats (350-400 g), a catheter was inserted into the bladder in order to instill reagents (2.4 ml/h) and to measure intravesical pressure. After detecting 4-5 micturition reflexes induced by saline instillation, GYY4137 solution (10-8, 10-7, and 10-6 M) or vehicle was instilled.

RESULTS

(1) MPST and CAT were detected in the bladder and prostate and CBS was only

detected in the prostate (Fig. 1A). Expression levels of MPST in the prostate were higher than those in the bladder, and those in the PR-D were higher than those in the PR-V (Fig. 1A). In expression levels of CAT, there was no significant difference among each tissue (Fig. 1A). Expression levels of CBS in the PR-V were higher than those in the PR-D (Fig. 1A). On the other hand, CSE and DAO were not detected in both tissues (data not shown). Immunoreactvities of these enzymes were mainly detected in the urothelium and smooth muscle layer of the bladder, and in the prostate glandular epithelium (Fig. 1B).

(2) H2S was detected in the bladder and prostate tissues (Fig. 1C).

(3) NaHS dose-dependently induced relaxation of pre-contracted BL-D, BL-T, PR-D and PR-V strips. There were no significant differences of the EC50 values or maximal relaxation rate against the pre-contractions among any of these tissues (Table 1A).

Intravesically instilled GYY4137 significantly prolonged intercontraction intervals (ICI) compared to the vehicle-treated group (Table 1B), and showed, although non-significant, tendency to reduce maximal voiding pressure (MVP) compared to the vehicle-treated group (Table 1B).

INTERPRETATION OF RESULTS

In the bladder, the MPST/CAT pathway is major for H2S biosynthesis, while in the prostate, CBS and MPST/CAT pathways are involved in the biosynthesis. Considering tissue distribution of these enzymes, H2S might be produced from smooth muscle layer and urothelium in the bladder, thereby inducing relaxation of detrusor smooth muscle by autocrine and paracrine manners. In the prostate, these enzymes are mainly distributed in the glandular epithelium, indicating that endogenously produced H2S might relax prostate sommth muscle in a paracrine manner. In this study, we found endogenous H2S at lower nmol range in homogenized rat bladder and prostate for the first time by the methylene blue method, which is performed in acidic condition; therefore, a limitation of the method is that the incorporation of acid-labile sulfide may impact on the interpretation of the actual H2S level. Because reliable methods to measure endogenous H2S are lacking, further studies are necessary to examine "more precise" endogenous H2S levels in the bladder and prostate.

Although site-specific effects of H2S donors in the bladder are speculated [2,3], both BL-D and BL-T strips were relaxed by NaHS in this study. It is reported that NaHS induced contraction of detrusor strips at millimolar orders [2], much higher than those induced bladder strips relaxation in this study. In addition, intravesically instilled GYY4137 induced prolongation of ICI and reduction of MVP at sub-micromolar doses. Because gasotransmitters-induced responses are generally much dependent on doses (physiological responses at lower doses and toxic effects at higher doses), physiclogical roles of H2S in the bladder may be an endogenous relaxation factor. Furthermore, to our knowledge, this is the first report showing H2S-induced relaxation of prostate smooth muscle.

CONCLUDING MESSAGE

Our present data suggest that H2S has a role as an endogenous relaxation factor in the rat bladder and prostate. Therefore, endogenous H2S might open new avenues of therapeutic interventions for lower urinary tract dysfunctions such as overactive bladder and benign prostatic hyperplasia.

FIGURE 1

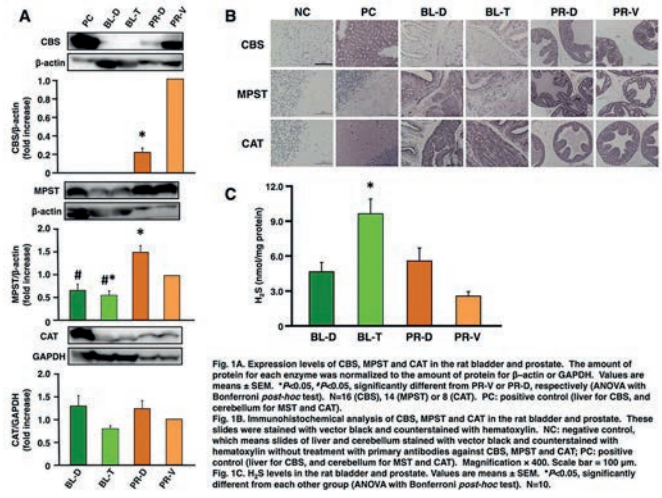

Fig. 1A. Expression levels of CBS, MPST and CAT in the rat bladder and prostate. The amount of protein for each enzyme was normalized to the amount of protein for β-actin or GAPDH. Values are means ± SEM. *P<0.05, #P<0.05, significantly different from PR-V or PR-D, respectively (ANOVA with Bonferroni *post-hoc* test). N=16 (CBS), 14 (MPST) or 8 (CAT). PC: positive control (liver for CBS, and cerebellum for MST and CAT).
Fig. 1B. Immunohistochemical analysis of CBS, MPST and CAT in the rat bladder and prostate. These slides were stained with vector black and counterstained with hematoxylin. NC: negative control, which means slides of liver and cerebellum stained with vector black and counterstained with hematoxylin without treatment with primary antibodies against CBS, MPST and CAT; PC: positive control (liver for CBS, and cerebellum for MST and CAT). Magnification × 400. Scale bar = 100 μm.
Fig. 1C. H_2S levels in the rat bladder and prostate. Values are means ± SEM. *P<0.05, significantly different from each other group (ANOVA with Bonferroni *post-hoc* test). N=10.

FIGURE 2

Table 1A. Data from functional studies in the rat bladder and prostate tissues

Group	Maximal relaxation rate (%)	EC_{50} (M)
BL-D	41.3 ± 3.2 (N=17)	9.3 ± 3.5 (× 10^{-6}) (N=17)
BL-T	39.5 ± 3.5 (N=19)	4.3 ± 1.2 (× 10^{-6}) (N=19)
PR-D	41.8 ± 2.9 (N=18)	10.1 ± 10.1 (× 10^{-6}) (N=18)
PR-V	41.8 ± 3.7 (N=25)	1.2 ± 1.1 (× 10^{-6}) (N=25)

Values are means ± SEM.

Table 1B. Effect of intravesically instilled GYY4137 on urodynamic parameters in continuous cystometry

	Intercontraction intervals (%)		Maximal voiding pressure (%)	
Dose of GYY4137	Vehicle (N=10)	GYY4137 (N=12)	Vehicle (N=10)	GYY4137 (N=12)
Saline	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0	100.0 ± 0.0
10^{-8} (M)	104.0 ± 15.3	154.1 ± 16.1*	91.1 ± 2.9	90.5 ± 2.0
10^{-7} (M)	108.2 ± 12.7	159.2 ± 20.4*	90.3 ± 4.0	82.9 ± 2.2
10^{-6} (M)	116.9 ± 12.6	175.0 ± 15.4*	91.8 ± 5.4	80.2 ± 3.4

Data were calculated as the ratio to the control values (Saline) before GYY4137 (H_2S donor) or vehicle instillation showed as means ± SEM. *P<0.05, significantly different from Vehicle (unpaired Student *t*-test). Vehicle; 3.3 × 10^{-5}% *N,N*-dimethylformamide/saline.

REFERENCES

1. Kimura H. The physiological role of hydrogen sulfide and beyond. Nitric Oxide. 2014;41:4-10.
2. Patacchini R, Santicioli P, Giuliani S, et al. Pharmacological investigation of hydrogen sulfide (H2S) contractile activity in rat detrusor muscle. Eur J Pharmacol. 2005;509:171-177.
3. Fernandes VS, Ribeiro AS, Martínez MP, et al. Endogenous hydrogen sulfide has a powerful role in inhibitory neurotransmission to the pig bladder neck. J Urol. 2013;189:1567-1573.

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51 www.ics.org/2018/abstract/51

EFFECTS OF RQ-00434739, A TRANSIENT RECEPTOR POTENTIAL MELASTATIN 8 (TRPM8) CHANNEL ANTAGONIST, ON DEEP BODY TEMPERATURE AND ON BLADDER FUNCTION IN RATS

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HYPOTHESIS / AIMS OF STUDY

TRPM8 is a non-selective cation channel having multiple modes of activation such as cold (<28 degrees celsius) and chemical agents (icilin and menthol), and has been widely expressed in urothelial cells, in sensory nerve fibers within the urothelium and suburothelium of the bladder, and in L6 dorsal root ganglia (DRG) of the rat, and also in the urothelial cells of the human bladder [1]. Because TRPM8 channels have thermal sensitivity, it is possible that drugs acting on TRPM8 can influence body temperature. In fact, hypothermic effects of TRPM8 antagonist have been demonstrated in rats [2], which may be an unfavorable effect for clinical development. RQ-00434739 (RQ) was newly developed as a potent and selective antagonist for TRPM8, and its selectivity for TRPM8 channel is more than 100-fold against other ion channels (TRPA1, TRPV1, TRPM2, Nav1.3, Nav1.5, Nav1.7, Cav2.2 and Cav3.2) [3]. To disclose the physiological role of TRPM8 channel in the bladder and to explore the possibility of RQ as a therapeutic target for bladder sensory disorders, we examined effects of RQ on deep body temperature and on bladder function including the in vivo primary bladder single-unit afferent activities (SAAs) in rats.

STUDY DESIGN, MATERIALS AND METHODS

Thirty-four female Sprague-Dawley rats were used. The effect of RQ on deep body temperature (intrarectal temperature) was evaluated with intravenous (i.v.) administration of RQ (1 mg/kg) or its vehicle under urethane-anesthesia (1.2 g/kg intraperitoneally). Effects of RQ (1 mg/kg, i.v.) on bladder function were investigated using SAA and cystometry (CMG) measurements during saline-instillation (6 ml/hour). In the SAA measurements, rats were anesthetized with urethane

(1.2 g/kg, intraperitoneally) and the SAAs recorded from the left L6 dorsal root were classified by conduction velocity (2.5 m/second) as Aδ- or C-fibers by electrical stimulation of the left pelvic nerve and by bladder distention. In the CMG measurements, 4 days after bladder catheterization, measurements were performed in a conscious free-moving condition, and CMG parameters were analysed before and after drug-administrations for 1 hour in each.

RESULTS

RQ did not affect deep body temperature (Figure 1). In the CMG measurements (N = 6 in each group), mean voided volume was significantly increased after RQ administration (before-administration: 1.39 ± 0.16 ml, after-administration: 1.69 ± 0.10 ml), but such increased response was not seen with vehicle administration. In the SAA measurements, 16 single afferent fibers (n = 8 in each fiber) were isolated from 13 rats. SAAs of C-fibers, but not of Aδ-fibers, were significantly decreased after RQ administration (Figure 2).

INTERPRETATION OF RESULTS

RQ (1 mg/kg), of which dose did not influence body temperature, significantly increased mean voided volume and inhibited SAAs of C-fibers during saline-instillation. These results suggest that RQ, a novel TRPM8 antagonist, has an inhibitory effect on the physiological bladder sensory activation via supressing mechanosensitive C-fibers in rats. These results are in line with those of a previous study by measuring ex vivo afferent activities [2].

CONCLUDING MESSAGE

The present results demonstrated that RQ, a novel TRPM8 antagonist, increases mean voided volume and inhibits activity of bladder mechanosensitive C-fiber without affecting body temperature. RQ may be a promising drug for the treatment of bladder sensory disorders.

FIGURE 1

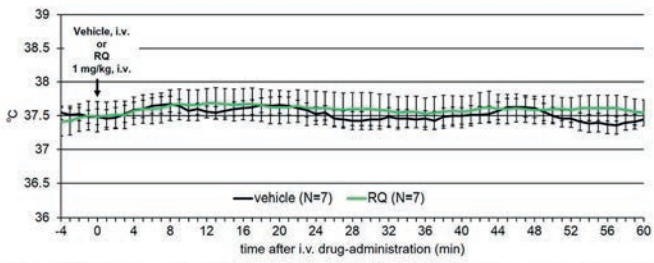

Figure 1. Effects of i.v. administration of vehicle or RQ (1 mg/kg) on body temperature (intrarectal temperature) under a urethane-anesthetized condition
No significant differences were found before and after vehicle or RQ administration (repeated measures analysis of variance followed by Dunnett's test).
No significant differences were found between vehicle and RQ administrations at each time-point (unpaired Student's t-test).

FIGURE 2

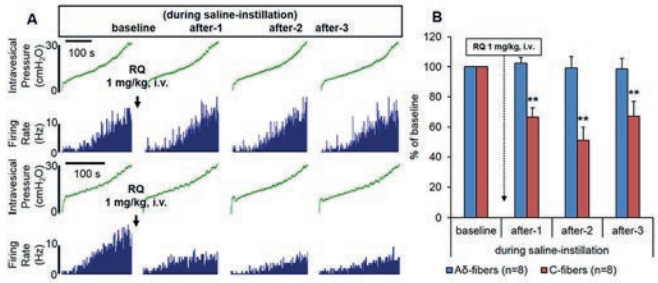

Figure 2.
A: Representative traces of the intravesical pressure and firing rate of mechanosensitive afferent Aδ-fiber (upper trace) and C-fiber (lower trace) before and after RQ (1 mg/kg) i.v.-administration during saline-instillation
B: Effects of RQ on SAAs of Aδ- and C-fibers during saline-instillation
Values are expressed as mean ± SEM.
**P<0.01: from baseline in each group (repeated measures ANOVA followed by Dunnett's test)

REFERENCES

1. Stein, R. J. et al. Cool (TRPM8) and hot (TRPV1) receptors in the bladder and male genital tract. J Urol 172, 1175-1178, doi:10.1097/01.ju.0000134880.55119.cf (2004).
2. Ito, H. et al. Functional role of the transient receptor potential melastatin 8 (TRPM8) ion channel in the urinary bladder assessed by conscious cystometry and ex vivo measurements of single-unit mechanosensitive bladder afferent activities in the rat. BJU Int 117, 484-494, doi:10.1111/bju.13225 (2016).
3. Ohshiro, H. et al. In Vitro and In Vivo Charactarization of RQ-00434739: A Novel Orally Active and Selective TRPM8 Antagonist for the Treatment of Oxalipaltin-Induced Peripheral Neuropathic Pain. Poster No. 284 in 16th World Congress on Pain (Sep 26, 2016- Sep 30, 2016, Yokohama, Japan)

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BLOCKAGE OF PURINERGIC P2X7 RECEPTOR REDUCES MUCOSA DAMAGE AND RESTORES DIMINISHED CONTRACTILITY IN AN EX-VIVO INFLAMMATION MODEL OF PORCINE BLADDER

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HYPOTHESIS / AIMS OF STUDY

Cyclophosphamide is a chemotherapeutic agent used for the treatment of breast cancer and lymphoma. Cyclophosphamide is metabolised to acrolein, which is highly toxic and excreted into urine, which can cause severe bladder inflammation with immune alterations (1). The purinergic P2X7 receptor is highly expressed by many immune cells and it is

known to regulate the expression and secretion of inflammatory mediators including IL-1β and TNF-α (2). P2X7 receptor activation leads to the formation of a large membrane pore, which results in inflammasome activation and cell apoptosis (3). This study aimed to i) develop an ex-vivo model of urothelial inflammation by perfusing porcine bladders with acrolein, ii) to determine if urothelium inflammation affects the physiological function of the bladder and iii) to determine if pharmacological blockage of P2X7 receptor can protect against acrolein-induced inflammation and damage in the bladder.

STUDY DESIGN, MATERIALS AND METHODS

The whole bladders (n=9) from 2-month-old female pigs were placed in 100-ml organ baths containing Krebs-Henseleit solution maintained at 37°C and perfused for 4 hours with carbogenated RPMI culture media (1640 medium Sigma-Aldrich), in the presence or absence of 0.05% acrolein (110221 Sigma-Aldrich) via a fine tube that was inserted into the bladder through the urethral orifice.

After 4 hours of perfusion, each bladder was dissected into 5 x 10 mm strips: intact strips (containing the entire layer of the bladder wall), detrusor strips and mucosal strips. The contractility of each strip in response to acetylcholine (ACh) was measured. Histology staining and immunohistochemistry of caspase-3 (ab2302 Abcam, 1:200), a marker for cell apoptosis, were performed to determine the degree of tissue damage and apoptosis.

To study the role of P2X7 receptor, bladders were pre-treated with the P2X7 receptor antagonist A804598 (Sigma-Aldrich) for 1 hour, prior to 4 hours perfusion with acrolein, to determine the effect of this antagonist on inflammatory responses.

RESULTS

The histology staining showed that in the perfusion control group the structure of the bladder was maintained (Figure 1A). The urothelium, however, was markedly damaged by acrolein perfusion (Figure 1B). Interestingly, pre-treating the bladder with P2X7 receptor antagonist A804598 protected the urothelium from acrolein-induced damage (Figure 1C).

The caspase-3 immunoreactivity (IR), which indicates an apoptosis response, was mainly localised to urothelium in control tissues. In the acrolein treated bladder, increased caspase-3 positive cells were seen in the urothelial and suburothelial regions (Figure 1D). Quantitative analysis of caspase-3-IR staining showed that acrolein-enhanced caspase-3-IR was significantly blocked by the presence of A804598 (10 M), suggesting that A804 598 inhibited apoptosis (Figure 1E).

ACh contracted intact, detrusor and mucosa strips of perfusion control bladder in a concentration dependent manner (Figure 2). In the acrolein-treated bladder, the contractile responses to ACh were significantly diminished in intact strips and completely abolished in mucosal strips but were slightly reduced in detrusor strips. Pre-treating bladders with the P2X7 receptor antagonist A804598 at 10 μM significantly reversed acrolein-induced reduction in response to ACh (Figure 2).

INTERPRETATION OF RESULTS

In this study, we have established an ex-vivo inflammatory model in the porcine bladder. Acrolein treatment increased apoptosis in the suburothelial layer and the urothelium. Furthermore, acrolein completely abolished the contractility of the mucosal strips to ACh, suggesting that acrolein severely damaged myofibroblasts and other contractile apparatus in the mucosa. An important finding of this study was that the blockage of P2X7 receptor by its antagonist, A804598, remarkably protected the urothelium from structural damage and apoptosis. This may suggest that the P2X7 receptor is involved in the process of cyclophosphamide induced haemorrhagic cystitis in chemotherapy patients.

CONCLUDING MESSAGE

Our study has provided strong evidence that the P2X7 receptor plays an important role in bladder inflammation. The inhibition of P2X7 receptor activities could be a pathway for the treatment of bladder inflammation and could potentially be co-administered with cyclophosphamide for chemotherapy.

FIGURE 1

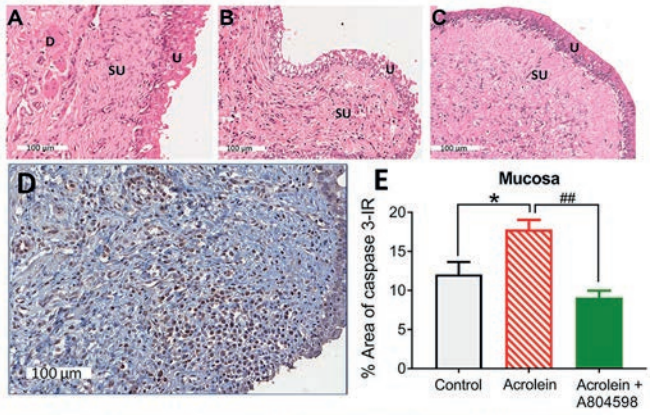

Figure 1: Top panels: H&E staining of the mucosa layer, consisted of urothelium and sub-urothelium, of the porcine bladders in **A**, RPMI-perfusion control; **B**, acrolein treated and **C**, P2X7 receptor antagonist A804598 pre-incubated + acrolein (U= urothelium layer, SU = suburothelial layer, D= detrusor smooth muscle bundle).
Bottom panels: **D**, a representative image of caspase-3 staining in the mucosal layer of an acrolein-treated bladder specimen. **E**, Quantitative analysis of caspase-3 staining in porcine bladder mucosa using ImageJ. *, $P < 0.05$ compared to perfusion control; $^{\#\#} P < 0.01$ compared to acrolein treated (one-way ANOVA followed by Bonferroni test, n = 6).

FIGURE 2

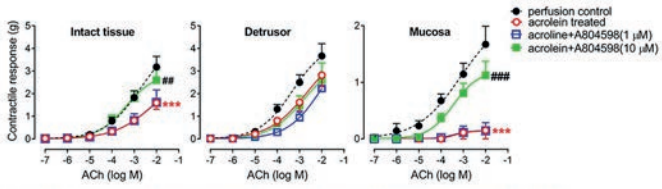

Figure 2: Contractile responses of different layers of bladder strips to ACh in RPMI-perfused control, acrolein treated and acrolein treatment in the presence of P2X7R antagonist A804598 (1 and 10 μM). Data were analysed by two-way ANOVA, followed by Bonferroni test (n=6; ***, $P < 0.001$ compared to perfusion control. $^{\#\#}$, $P < 0.01$ and $^{\#\#\#}$, $P < 0.001$, compared to the acrolein treated group).

REFERENCES
1. MOGHE, A., GHARE, S., LAMOREAU, B., MOHAMMAD, M., BARVE, S., MCCLAIN, C. & JOSHI-BARVE, S. 2015. Molecular Mechanisms of Acrolein Toxicity: Relevance to Human Disease. Toxicol Sci 143, 242-255.
2. DE MARCHI, E., ORIOLI, E., DAL BEN, D. & ADINOLFI, E. 2016. Chapter Two - P2X7 Receptor as Therapeutic Target. In: ROSSEN, D. (ed.) Advances in Protein Chemistry and Structural Biology. Academic Press.
3. LOCOVEI, S., SCEMES, E., QIU, F., SPRAY, D. C. & DAHL, G. 2007. Pannexin1 is part of the pore forming unit of the P2X(7) receptor death complex. FEBS Lett, 581, 483-488.

Funding N/A **Clinical Trial** No **Subjects** None

53 www.ics.org/2018/abstract/53

THE ROLE OF MITOCHONDRIA IN IRRADIATION-INDUCED UROTHELIAL DYSFUNCTION—IMPLICATIONS FOR RADIATION CYSTITIS

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HYPOTHESIS / AIMS OF STUDY

Exposure of the lower urinary tract (LUT) to ionizing radiation for the treatment of pelvic tumors can cause the development of radiation cystitis (RC). The acute phase of RC is characterized by irritative symptoms including urinary frequency and mild hematuria. However, up to 10% of patients can develop a severely debilitating form of chronic RC which can include; decreased bladder compliance and voiding function due to extensive fibrosis and severe hematuria [1]. The mechanisms that lead to chronic RC are unclear and the aim of this study was to determine the physiological and metabolic consequences of ionizing radiation on the mouse urinary bladder.

STUDY DESIGN, MATERIALS AND METHODS

Primary mouse urothelial cell isolation: Adult female C57BL/6 mice were sacrificed, urinary bladders isolated and opened along the ventral aspect to expose the mucosal surface. The bladders were washed with sterile Hank's balanced salt solution (HBSS) and incubated overnight at 4°C in minimal essential medium (MEM) with 200 units of dispase. The bladder surface was washed with fresh MEM and the mucosal surface gently scraped and urothelial cells collected. The cells were washed twice by centrifugation and plated on collagen coated coverslips at a density of 20,000 cells per coverslip and kept in culture for three days before experiments. Coverslips were exposed to 0 or 4 Gray of X-ray irradiation (Precision Instruments X-RAD320 biological irradiator, 1 Gray = 100 Rads) following preincubation with mitochondrial targeted free radical scavenger, XJB-5-131 (1 μM) or vehicle (DMSO) for 60 minutes before irradiation. Cells were examined 15 min, 1 hour, 6 hours and 24 hours after irradiation.

Mitochondrial membrane potential and reactive oxygen species (ROS) fluorescence imaging: Mouse urothelial cells were loaded with either tetramethylrhodamine, Methyl Ester (TMRM) or dihydrorhodamine 123 (DHR123) to record mitochondrial membrane potential and ROS production, respectively. The changes in fluorescence intensity for each dye in response to irradiation was evaluated using an Olympus IX71 fluorescence microscope.

Selective mouse bladder irradiation: Mice were anesthetized with 300 mg/kg of 2,2,2-tribromoethanol (intraperitoneal injection) and a lower midline incision made to externalize the urinary bladder. The mice were mounted on lexan platforms that allowed the bladders to be held outside the abdominal cavity by a suture attached to the urachus in the path of a focused X-ray beam (10 Gray). Following irradiation, the bladders were internalized, the incisions sutured and animals allowed to recover up to three days with prophylactic analgesic and antibiotic treatments.

Immunofluorescence: Mice were sacrificed, bladders isolated and fixed with 4% paraformaldehyde. Tissue were cryopreserved in 30% sucrose solution, frozen in optimal cutting medium and sectioned on a cryostat. Bladder sections were probed with antibodies targeting cytokeratin (CK)-20 to determine integrity of the apical urothelial layer. Tissue were additionally stained with DAPI (nuclear marker) and rhodamine-phalloidin (actin stain).

RESULTS

Bladder irradiation causes disruption of the apical urothelial layer. Immunofluorescence (Figure 1A and B) demonstrated that the CK-20 positive apical urothelial cell layer (green – CK20, red – phalloidin, blue – DAPI) was significantly disrupted at one day following irradiation (Figure 1B, highlighted with a white arrow) which began to regenerate by three days post-exposure (not shown).

Ionizing radiation acutely decreases mitochondrial membrane potential and enhances ROS production in urothelial cells. Irradiated urothelial cells showed a significant decrease in mitochondrial membrane potential and enhancement of ROS levels within 15 minutes post-exposure (Figure 2A and B). Irradiation induced changes were observed for up to 6 hours post-exposure before returning to levels comparable to control cells (not shown). Pretreatment with 1 μM XJB-5-131 protected against irradiation induced mitochondrial damage.

INTERPRETATION OF RESULTS

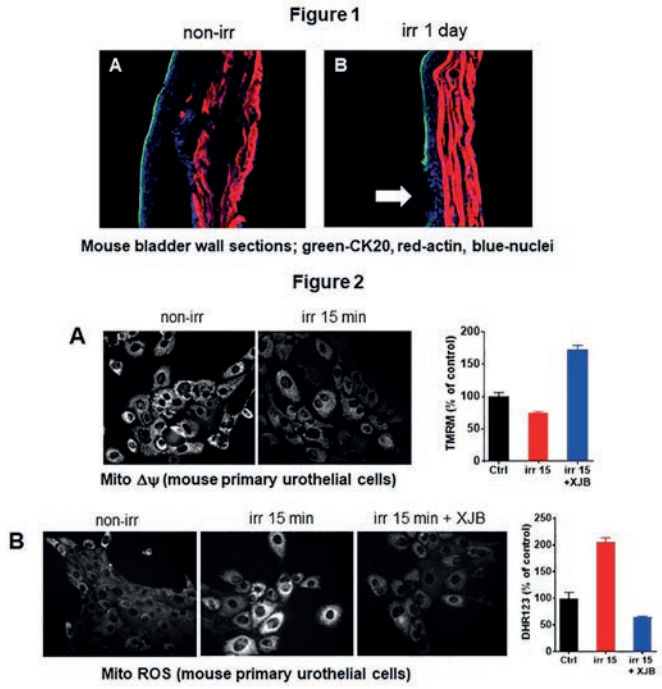
These data demonstrate that urothelial cells are radiosensitive and that exposure to ionizing radiation causes acute disruption of the urothelial layer. This correlated with enhanced mitochondrial ROS generation and depolarization of the mitochondrial membrane potential. These changes may account for the irritative symptoms of early stage RC. Pretreatment of urothelial cells with the mitochondrial-targeted free

radical scavenger, XJB-5-131 (developed by our group), prevented irradiation induced damage and could be a potential protective agent against RC. Although the urothelium can recover from the initial insult, there may still be long-term consequences to urothelial mitochondria function that contribute to the development of chronic stage RC. These could include persistent enhancement of ROS production and/or impairment of mitochondrial clearance (i.e., mitophagy).

CONCLUDING MESSAGE

The urothelium is highly sensitive to oxidative damage including that induced by exposure to ionizing radiation. We have demonstrated that one of the earliest responses following irradiation is mitochondrial damage which may have long-term implications on urothelial cell survival and function. These findings may have implications on understanding the response of the urothelium to injury, oxidative stress and aging.

FIGURE 1



REFERENCES

1. Browne, C., Davis, N. F., Mac Craith, E., Lennon, G. M., Mulvin, D. W., Quinlan, D. M., Mc Vey, G. P., Galvin, D. J.: A Narrative Review on the Pathophysiology and Management for Radiation Cystitis. Adv Urol, 2015: 346812, 2015

Funding NIH/NIDDK DK071085 **Clinical Trial** No **Subjects** Animal **Species** Mouse **Ethics Committee** University of Pittsburgh Institutional Animal Use and Care Committee

54 www.ics.org/2018/abstract/54

HISTAMINE H3 RECEPTOR INHIBITED THE INFLAMMATORY RESPONSE DURING C2C12 STRIATED MYOGENESIS INDUCED BY EXOGENOUS ALPHA TUMOR NECROSIS FACTOR

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HYPOTHESIS / AIMS OF STUDY

To investigate the effects of Histamine H3 receptor on the inflammatory response during C2C12 striated myogenesis induced by alpha tumor necrosis factor (α-TNF), which discloses the role of H3 receptor when exogenous inflammatory stimulation occurs in urethral sphincter during the development and the repair process from the molecular aspect.

STUDY DESIGN, MATERIALS AND METHODS

The C2C12 myogenesis (striated differentiation) was induced to mimic the development and repair process of urethral sphincter and three timepoints at the differentiation day 1,3,6 (D0, D3, D6) were recorded. Histamine H3 receptor agonist Methimepip (Met) and antagonist Cirpoxifan (CPX) stimulated the cells and the cell count kit-8 (CCK 8) method and flow cytometry (FCM) was used to detect the cell growth and apoptosis induced by α-TNF. The inflammasome marker nucleotide-binding oligomerization domain like receptor family, pyrin domain-containing 3 (NLRP3) and the three differentiation markers (early, middle and late markers) MyoD1, Myogenin and myosin-2, were detected by real-time quantitative Polymerase Chain Reaction (Q-PCR) method. The secretion of inflammatory cytokines interleukin-1 beta (IL-1β) was detected by enzyme-linked immuno-sorbent assay (ELISA).

RESULTS

During C2C12 myogenesis, α-TNF inhibited the cells growth by CCK8 and only α-TNF+CXP induced 30% apoptosis of D6 cells by FCM. Alpha-TNF induced inflammasome gene NLPR3 mRNA expression up to 201% vs.190% in D3 and D6, respectively; Met reduced the NLRP-3 by α-TNF as 33%vs.37%, while CPX increased the effect of α-TNF on NLRP-3 as 23%vs.24% in D3 and D6. Alpha-TNF reduced the expression of myogenesis marker MyoD1 in D3 and D6 by 45 % and 43 %, Myogenin by 29%vs.35%, and Myosin-2 by 42%vs.33%, respectively; Met increased the inhibition effect of α-TNF on differentiated markers by 23%vs.31% 23%vs.26% 31%vs.36%; while CPX reduced the inhibitory effect of α-TNF on differentiated markers by 40%vs.25% 35%vs.31% 50%vs.21%. The secretion of IL-1β was 49.7 pmol/ml by α-TNF on D6 cells, and Met reduced the IL-1b secretion by α-TNF to 37.9 pmol/ml (T=12.5, P<0.001), while CPX increased α-TNF effects up to 64.4 pmol/ml (T=29.5, P<0.001).

Figure legends:

Fig. 1 Effects of α-TNF on apoptosis of C2C12 cells during myogenesis.

Notes: D0, undifferentiated cells, mainly myoblasts; D3, myoblasts differentiated for 3 days, around half myoblasts and half myotubes; D6, myoblasts differentiated for 6 days, mainly myotubes.

Fig. 2 The effects of α-TNF on the mRNA expression of myogenesis markers and inflammasome key element NLRP-3 gene during myogenesis

Notes: D0, undifferentiated cells, mainly myoblasts; D3, myoblasts differentiated for 3 days, around half myoblasts and half myotubes; D6, myoblasts differentiated for 6 days, mainly myotubes. Ctrl, control group; T, α-TNF group; T-M, α-TNF +Methimepip (Met, H3 receptor agonist) group; T-C, α-TNF + Ciproxifan (H3 receptor blocker) group. , there are statistic differences compared with the control group ($P<0.05$); : statistic differences compared with α-TNF group ($P<0.05$). Repeat samples, n=9.

INTERPRETATION OF RESULTS

Histamine is a biogenic amine widely existing in plants and animals, and involved in the immune and biochemical functions of the body. Up to now, there are 4 subtypes of receptors, histamine H1, H2, H3, H4 receptor reported. In our previous research, we found histamine receptors subtype of H1, H2 and H3 receptors in striated C2C12 myogenesis and adult mid-urethral striated muscles [1]. The expression of H3 receptor is increasing amazingly during myogenesis, and H3 receptor is also found to diminish cytoplasma calcium peak of the differentiated C2C12 myotubes under electrical stimulation [2]. It has been reported that inflammasome key element NLRP3 protein produced in mouse C2C12 myoblasts when inflammation occurs, and proper concentration of α-TNF can induce inflammation, autophagy and apoptosis in mouse C2C12 cells; NLRP3 inflammasome, which is involved in innate immunity and in most inflammatory reactions, was found in C2C12 inflammation [3]. We hypothesized that C2C12 myogenesis can be modeled as for the development and repair of urethral sphincter. We attempted to induce the inflammatory response of C2C12 cells during myogenesis by exogenous stimulation of α-TNF and checked whether H3 receptor is functional there, which would give some references about whether H3 receptor functions when exogenous inflammatory stimulation occurs in the process of the development and repair of the urethral sphincter. From our pilot and incomplete results at present, we find that histamine H3 receptor agonist Met might reduce the inflammation induced by α-TNF, while CPX might increase the effects of α-TNF during the myogenesis day 3,6 (D3, D6),by detecting inflammation related gene NLRP-3 and secretion of the cytokine IL-1β.

CONCLUDING MESSAGE

α-TNF can induce inflammatory response during C2C12 striated myogenesis and might inhibit this differentiation process, while histamine H3 receptor might inhibit the inflammatory response induced by α-TNF. So it might be promising that during the development and the postoperative repair process of the urethral sphincter, the exogenous inflammatory stimulus may reduce the process, but activation of H3 receptor might counteract the effects from the exogenous inflammatory stimulus.

FIGURE 1

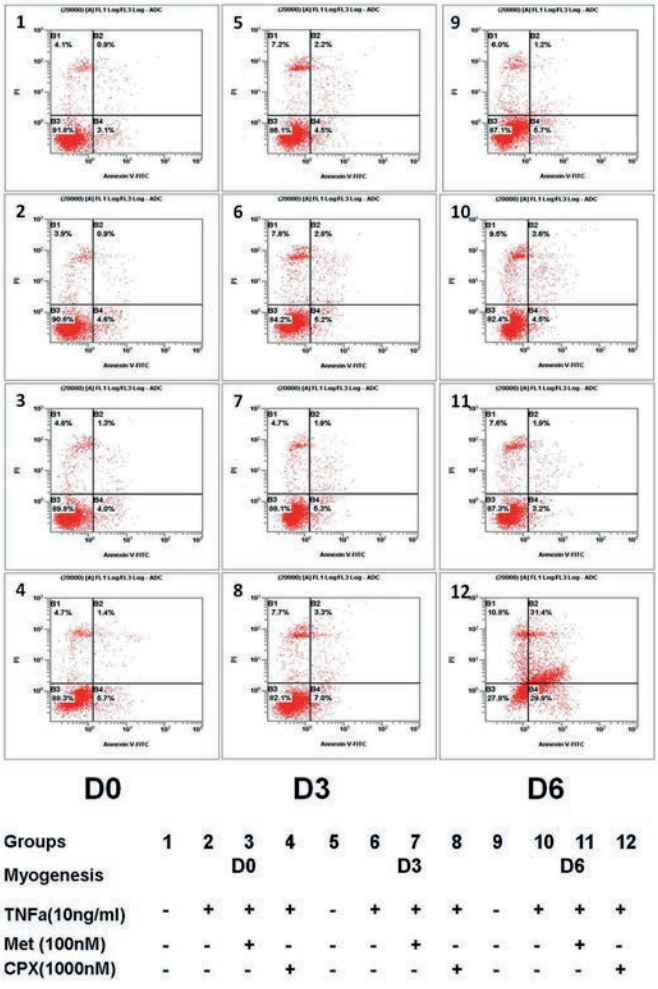
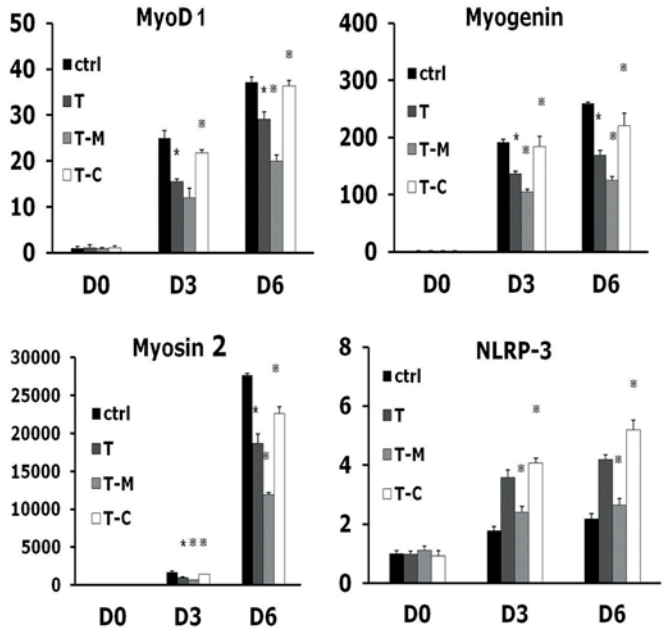


FIGURE 2



REFERENCES

1. Chen Y, Stegaev V, Kouri VP, Sillat T, Chazot PL, Stark H, Wen JG, Konttinen YT. Identification of histamine receptor subtypes in skeletal myogenesis. Mol Med Rep. 2015 Apr; 11(4):2624-30. doi: 10.3892/mmr.2014.3073.
2. Chen Y, Paavola J, Stegajev V, Stark H, Chazot PL, Wen JG, Konttinen YT. Activation of histamine H3 receptor decreased cytoplasmic Ca (2+) imaging during electrical stimulation in the skeletal myotubes. Eur J Pharmacol. 2015 May 5; 754:173-8. doi: 10.1016/j.ejphar.2015.02.035.
3. Gallo D, Gesmundo I, Trovato L, Pera G, Gargantini E, Minetto MA, Ghigo E, Granata R.GH-Releasing Hormone Promotes Survival and Prevents TNF-a-Induced Apoptosis and Atrophy in C2C12 Myotubes. Endocrinology. 2015 Sep; 156(9):3239-52. doi: 10.1210/EN.2015-1098.

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55 www.ics.org/2018/abstract/55

RANDOMIZED, PLACEBO-CONTROLLED, CLINICAL TRIAL IN INTERSTITIAL CYSTITIS/ BLADDER PAIN SYNDROME SHOWS COMMON SYMPTOM PRESENTATION BUT HIGHER RATES OF HUNNER LESIONS IN EUROPEAN PATIENTS

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HYPOTHESIS / AIMS OF STUDY

Interstitial Cystitis/Bladder Pain Syndrome (IC/BPS) is a chronic condition characterized by bladder pain and urinary symptoms including increased frequency and urgency. Rosiptor (AQX-1125), a SHIP1 enzyme activator, is a novel, once-daily oral medication being evaluated in a global clinical trial (LEADERSHIP 301) for its efficacy and safety in subjects with moderate to severe symptoms of IC/BPS. Preliminary blinded baseline demographics and characteristics from randomized subjects were analyzed to better understand if the population being evaluated was similar between North America and Europe.

STUDY DESIGN, MATERIALS AND METHODS

LEADERSHIP 301 is a 12-week, randomized, double-blind, placebo-controlled, Phase 3 clinical trial evaluating the efficacy and safety of two doses of rosiptor (100 mg or 200 mg) vs placebo in subjects with moderate to severe symptoms of IC/BPS. Preliminary blinded baseline demographics and disease characteristics assessed included age, race, time since diagnosis, presence or absence of Hunner lesions, average bladder pain based on an 11-point numerical rating scale (NRS), voiding over a 24-hour period, and symptom scores based on the following questionnaires: Bladder Pain/Interstitial Cystitis Symptom Score (BPIC-SS), O'Leary-Sant Interstitial Cystitis Symptom Index (ICSI), and O'Leary-Sant Interstitial Cystitis Problem Index (ICPI).

RESULTS

As of December 31, 2017, 351 subjects had been randomized to either placebo, rosiptor 100 mg, or rosiptor 200 mg. The majority of subjects were female (78%) and white (89% in North America and 99% in Europe). Baseline average bladder pain, voids per 24 hours, BPIC-SS, ICPI, and ICSI scores were similar between subjects in North America and Europe (Table) and representative of a patient population with moderate to severe symptoms. Mean duration since diagnosis was longer in North America (63.5 months) than in Europe (35.1 months); presence of Hunner lesions was higher in subjects from Europe (28.2%) compared to those in North America (11.7%).

INTERPRETATION OF RESULTS

Baseline demographics and characteristics of subjects randomized into the LEADERSHIP 301 clinical trial were very similar in North America and Europe for most parameters, and

in line with what would be expected based on the general population of patients with IC/BPS. The difference in time since diagnosis may be due to variations in clinical practice or health care system factors rather than in patient characteristics between regions. The higher rates of Hunner lesions in Europe may be due the respective approaches to cystoscopy between North America and Europe, and the way in which Hunner lesions are characterized. In North America, office cystoscopy under local anesthesia is typically used to identify the presence of Hunner lesions, while in Europe, cystoscopy with hydrodistension under general anesthesia is more common, with the procedure inducing bladder wall changes which are commonly characterized as Hunner lesions.

CONCLUDING MESSAGE

Baseline demographics and characteristics among subjects randomized into the LEADERSHIP 301 clinical trial were similar between North America and Europe. Enrolling patients with homogeneous baseline symptom presentation globally facilitates study data interpretation based on demonstrated symptom improvement, and data are then more likely to be generalizable across multiple regions. The difference in duration of diagnosis and presence of Hunner lesions may be due to variations in health system characteristics, clinical practice, or guideline interpretation between regions.

FIGURE 1

Table. Baseline Demographics and Disease Characteristics in LEADERSHIP 301

	North America		Europe	
	Female (n=148)	All subjects (n=188)	Female (n=126)	All subjects (n=163)
Age (years; mean ± SD)	48.9 ± 13.5	50.1 ± 13.7	51.3 ± 16.5	50.9 ± 16.3
Race, White (n, %)	129 (87.1)	168 (89.3)	124 (98.4)	161 (98.8)
Time since Diagnosis (months; mean ± SD)	66.7 ± 60.2	63.5 ± 59.5	35.3 ± 42.2	35.1 ± 42.4
Hunner Lesions (%)	8.1	11.7	30.2	28.2
NRS Average Bladder Pain (mean ± SD)	6.3 ± 1.0	6.3 ± 1.0	6.4 ± 1.0	6.4 ± 0.9
BPIC-SS (mean ± SD)	28.8 ± 4.5	28.8 ± 4.4	27.1 ± 4.2	26.5 ± 4.3
ICPI (mean ± SD)	12.5 ± 2.6	12.6 ± 2.6	12.7 ± 2.3	12.5 ± 2.3
ICSI (mean ± SD)	14.4 ± 3.3	14.5 ± 3.2	13.9 ± 3.0	13.7 ± 3.0
Voids per 24hrs (mean ± SD)	18.5 ± 9.7	18.9 ± 10.1	18.3 ± 10.7	17.6 ± 9.8

Total N includes all randomized subjects as of 31-Dec-2017; n for individual parameters may vary

Funding Aquinox Pharmaceuticals Inc sponsored this clinical trial and the development of this abstract. **Clinical Trial** Yes **Registration Number** NCT02858453 **RCT** Yes **Subjects** Human **Ethics Committee** Copernicus Group Independent Review Board **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "PELVIC PAIN SYNDROMES / SEXUAL DYSFUNCTION"

MRI IMAGING OF HUMAN BLADDER WALL USING INTRAVESICAL NOVEL CONTRAST MIXTURE: APPLICATIONS IN PAINFUL BLADDER SYNDROME/INTERSTITIAL CYSTITIS (PBS/IC)

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HYPOTHESIS / AIMS OF STUDY

There remains an unmet need for an imaging technique which will differentiate ulcerative Painful Bladder Syndrome/Interstitial Cystitis (PBS/IC) from non-ulcerative PBS/IC. MRI is a radiation-free imaging technique that demonstrates excellent contrast of pelvic tissues in 3D-anatomy. Past attempts at unenhanced [1] and contrast enhanced [2] T1 weighted MRI of human bladder wall were unable to improve the contrast-noise ratio (CNR) and the spatial resolution per image pixel. Intravesical novel contrast mixture (NCM) has been recently shown to improve the CNR of rat bladder wall injured with protamine sulfate [3]. In this clinical study, the safety and feasibility of MRI enhanced with intravesical NCM in evaluating patients with PBS/IC was tested.

STUDY DESIGN, MATERIALS AND METHODS

After giving informed consent, 6 women (25-78y) submitted to 3T MRI before and after intravesical NCM. The 6 women consisted of 2 controls, 2 with non-ulcerative PBS/IC, and 2 with ulcerative PBS/IC. NCM 50 ml was freshly prepared by diluting Gadobutrol (Gadovist, Bayer) 1:250 and Ferumoxytol (Feraheme, AMAG Pharmaceuticals) 1:104 in sterile water for injection (Figure 1). Respiratory monitoring belt was placed around patient and under receiver coil for checking breath-hold during fast image acquisition with repetition time/echo time of 5.5/2ms. Single slice of 5mm thickness was acquired during single breath-hold of 17 seconds for each flip angle to minimize the motion and chemical shift artifacts. Quantitative measurement of T1 made from the differences in signal intensity of 20 pixels representing bladder wall in pre-contrast and post-contrast images taken at different flip angles.

RESULTS

NCM instillation in subjects did not evoke pain or discomfort. Post-contrast bladder wall T1 relaxation times of ulcerative PBS/IC subjects were reduced from pre-contrast values by 44% compared to 18% for controls and non-ulcerative PBS/IC, *p<0.0001 using two-way ANOVA followed by Tukey's test (Figure 2). NCM enhanced-MRI increased the bladder wall CNR in all subjects by 4-fold in post-contrast images (57.84 ± 32.01 vs 12.34 ± 9.63, *p<0.02 using paired Student's t test) compared to pre-contrast images acquired with same parameters. Intravesical NCM allowed accurate determination of significant bladder wall thinning from 3.39±0.74 mm pre-contrast to 2.93±0.8 mm post-contrast,*p<0.05.

INTERPRETATION OF RESULTS

MRI enhanced with intravesical NCM allowed differentiation of the bladder wall into different tissue layers with an increased depth of gadolinium diffusion in the ulcerative-type PBS/IC patients. This pilot study was limited by the small size and was not powered to demonstrate the group-wise differences in bladder wall thickness. The significantly reduced bladder wall T1 relaxation times in the ulcerative PBS/IC patients are promising and warrant further evaluation in an independent trial with a larger sample size.

CONCLUDING MESSAGE

NCM instillation achieves artifact-free differential contrast and spatial resolution of human bladder wall, which is not possible with instillation or injection of single contrast agents. These findings demonstrate the safety and feasibility of NCM enhanced MRI to characterize changes within the bladder wall for phenotyping PBS/IC.

FIGURE 1

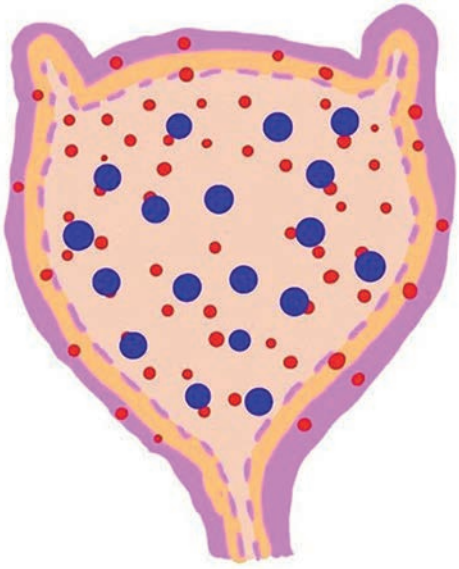

Figure 1: NCM is a mixture of 1:250 Gadolinium analog (Gadobutrol) (•) and 1:104 Ferumoxytol (●). The two contrast agents have different sizes and different contrast effects on spin-echo MRI.

FIGURE 2

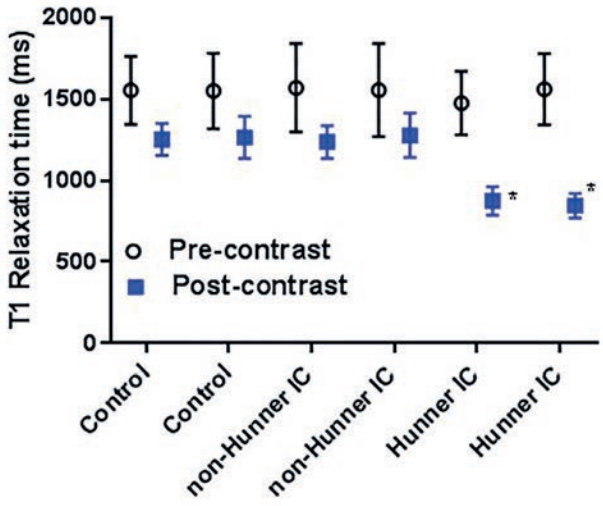

Figure 2: Post-contrast bladder wall T1 values (■) of Hunner type IC subjects were reduced from pre-contrast values (O) by 44% compared to 18% for controls and non-Hunner type IC, *p<0.0001.

REFERENCES

1. Verma S, Rajesh A, Prasad SR, Gaitonde K, Lall CG, Mouraviev V, Aeron G, Bracken RB, Sandrasegaran K (2012) Urinary bladder cancer: role of MR imaging. Radiographics 32:371–387.
2. Towner RA, Wisniewski AB, Wu DH, Van Gordon SB, Smith N, North JC, McElhaney R, Aston CE, Shobeiri SA, Kropp BP, Greenwood-Van Meerveld B, Hurst RE (2016) A feasibility study to determine whether clinical contrast enhanced magnetic resonance imaging can detect increased bladder permeability in patients with interstitial cystitis. J Urol 195:631–638.
3. Tyagi P, Janicki JJ, Hitchens TK, Foley LM, Kashyap M, Yoshimura N, Kaufman J (2017) Novel contrast mixture improves bladder wall contrast for visualizing bladder injury. Am J Physiol Renal Physiol 313:F155–F162.

Funding NIH NIDDK 1 R41 DK108397-01 **Clinical Trial** No **Subjects** Human **Ethics Committee** Institutional Review Board of University of Pittsburgh **Helsinki** Yes **Informed Consent** Yes

57 www.ics.org/2018/abstract/57

TITLE: EVALUATION OF URINARY CULTURES IN PATIENTS WITH INTERSTITIAL CYSTITIS/ BLADDER PAIN SYNDROME: ARE THERE DIFFERENCES IN COLONY COUNTS?

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HYPOTHESIS / AIMS OF STUDY

Interstitial Cystitis/ Bladder Pain Syndrome (IC/BPS) is still incompletely understood. Recent work suggests that the urinary microbiome plays an important role. This biological data could have implications in the diagnosis and treatment of IC/BPS. During evaluation of urinary symptoms, a urine culture is collected to rule out a urinary tract infection. We propose that there may be a correlation between low level bacterial counts in urine cultures in IC/BPS in the absence of a clinical urinary tract infection, defined as >100,000 colony-forming units (CFU) of bacteria.

The objective of this study is to examine the relationship between the findings of low colony-count cultures and patients with IC/BPS.

STUDY DESIGN, MATERIALS AND METHODS

Patient charts were reviewed from February 2017 through July 2017. Patients with a diagnosis of IC/BPS based on

ICD–10 coding, over the age of 18 were included in our analysis. Urine samples were sent for culture at each visit.

These cultures were assessed for growth, CFU, and type of bacteria. Statistical analysis was used to compare

urine culture results.

RESULTS

Our cohort was comprised of 428 patients, with a total of 826 urine cultures. Twenty-one of the patients were male (5%), providing 38 (5%) of the urine culture results.

The most common culture result was no growth, 561 (67.9%), followed by 10,000-50,000 CFU, (112, 13.6%), and then >100,000 CFU (66, 8.0%) (Table 1). The most common types of bacteria found in positive cultures were Enterococcus 26%, E. Coli 15%, Group B Strep (GBS) 13.6%, and Klebsiella 10.6% (Table 2).

We compared CFU of the four most common bacteria types, Enterococcus, E. Coli, Group Beta Strep, and Klebsiella with a significance value of $p < 0.0083$. Enterococcus grew out at lower CFU levels, 10,000-50,000CFU more often than E. Coli ($p=0.007$). GBS more commonly grew at 100-1000CFU compared to E Coli ($p<0.001$) and Klebsiella ($p=0.001$) (Table 3). Males were more likely than females to have no growth and lower colony forming units. When bacteria did grow, excluding contaminated cultures, there was no difference between males and females for type of bacteria.

INTERPRETATION OF RESULTS

Our data show that in patients with IC/BPS, urine cultures were significantly more likely to grow bacteria with a

lower CFU, most commonly 10–50,000 CFU. Enterococcus was the most common bacteria. The findings may be

related to several factors including regional microbiome and requires further investigation.

The most common urinary bacteria cultured from patients with IC/BPS were Enterococcus, E. coli, group B Streptococcus (GBS), and Klebsiella. In patients with IC/BPS these bacteria tend to culture out at lower CFU than 100,000 CFU. Clinicians can consider treating patients with IC/BPS with urinary cultures positive for bacteria with less than 100,000 CFU at this time.

CONCLUDING MESSAGE

This study emphasizes the need for making the DNA sequencing tests more available and more research into the microbiome of healthy bladders compared to those with IC/BPS. This area is poorly understood and may cause unnecessary use of antibiotics in patients with IC/BPS symptoms and re-addresses the role of infection in IC/BPS. It is still unclear if we should be treating patients with IC/BPS who have bacterial cultures of <100,000 CFU. Although, the most common growth count in this study were <100,000 CFU, knowing the microbiome of the healthy bladder and in IC/BPS patients can help to answer that question.

REFERENCES

1. Human Microbiome Project, C., Structure, function and diversity of the healthy human microbiome. Nature, 2012. 486(7402): p. 207-14
2. Brubaker, L. and A.J. Wolfe, The Female Urinary Microbiota/Microbiome: Clinical and Research Implications. Rambam Maimonides Med J, 2017. 8(2)
3. Brubaker, L. and A.J. Wolfe, The female urinary microbiota, urinary health and common urinary disorders. Ann Transl Med, 2017. 5(2): p. 34

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Drexel University College of Medicine **Helsinki** Yes **Informed Consent** No

58 www.ics.org/2018/abstract/58

STOOL AND VAGINAL MICROBIOTA TESTS AS A DIAGNOSTIC TOOL IN WOMEN WITH PAINFUL BLADDER SYNDROME / INTERSTITIAL CYSTITIS

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HYPOTHESIS / AIMS OF STUDY
The pathophysiology of Painful Bladder Syndrome / Interstitial Cystitis is currently unknown. Histamine seems to play a major role in IC as neurogenic inflammation is one of the hypothesis of IC. Antihistamines are part of the guideline recommendations, foods high in histamine (e.g. Shorter-Moldwin Food Sensitivity Questionnaire) aggravate IC symptoms. Vaginal microbiome tests recently assume changes in IC patients. Within this retrospective case collection the role of histamine overload in the gut is highlighted along with a gut and vaginal microbiota analysis.

STUDY DESIGN, MATERIALS AND METHODS
Between September 2012 and January 2018 a total of 97 women (range 19 to 81 years, mean age 47) were surveyed. Histamine in fecal samples was measured with a commercially available ELISA kit (LDN Labor Diagnostika Nord GmbH & Co. KG, Nordhorn, Germany).The results were compared to an age-matched cohort of 57 healthy women. Additionally, vaginal swabs were analysed. Furthermore a complete gut microbiota analysis was done in all women.

RESULTS
Stool results:

In 63 of the 97 analysed women elevated histamine levels were found in fecal samples. The first 57 IC patients were compared to an age-matched control-group of 57 healthy women for test validation. Moreover in most of the patients the protective anaerobic indicator microbiota (mainly lactobacilli and bifidobacteria) was also diminished.

Vaginal swab results:

In 44 out of the 63 women with the elevated histamine level the presence of Enterococcus ssp. and / or Enterobacteriaceae in vaginal swabs was also detected. In 27 women only the presence of Enterococcus ssp. and / or Enterobacteriaceae was found.

Only 7 women did neither show elevated histamine levels nor the presence of Enterococcus ssp. and/or Enterobacteriaceae in vaginal swabs.

INTERPRETATION OF RESULTS
There are paralleles between IC and histamine intolerance: prevalence of 1%, female predominance, middle age, symptom improvement in pregnancy due to a 500 fold higher level of the diamine oxidase (histamine eliminating enzyme). Histamine intolerance is a poorly described disease which can present with a variety of symptoms like e.g. migraine, irritable bowel syndrome, urticaria, tachykardia, nasal congestion and perhaps also IC? Histamine can increase intestinal permeability causing a leaky gut which prompts the body to initiate immune reactions like autoimmune diseases or leads to pain through toll-like receptor (TLR)-4 inflammatory response (shown by the MAPP research group). Both irritable bowel syndrome and autoimmune diseases are comorbidities of IC. Recent data in rats assume a cross-sensitization between bladder and colon due to altered permeability in 1 organ which affects the other organ.

The role of the vaginal dysbiosis with predominance of Enterococcus ssp. and/ or Enterobacteriaceae in the context of urogenital pain remains unclear as there are no data existing so far. Recent vaginal microbiome analyses suggest changes in IC patients.

CONCLUDING MESSAGE
Testing for histamine in stool and vaginal dysbiosis could be new diagnostic tools in Painful Bladder Syndrome / Interstitial Cystitis patients. Treatment with pre- and probiotics and colon cleansing already known in alternative medicine could be a new therapeutic option for IC patients.

REFERENCES
1. Schrepf et al, Pain 2014 Sep; 155(9):1755-61
2. Greenwood-Van Meerveld et al, J Urol 2015;194:804-11
3. Brandmeier-Fleming et al, Sci Rep 2016; 6:26083

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** It was a retrospective study **Helsinki** Yes **Informed Consent** No

59 www.ics.org/2018/abstract/59

A SYSTEMATIC REVIEW OF SURGICAL TECHNIQUES FOR THE TREATMENT OF BLADDER PAIN SYNDROME/ INTERSTITIAL CYSTITIS

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HYPOTHESIS / AIMS OF STUDY
Bladder pain syndrome/Interstitial cystitis (BPS/IC) is a poorly understood chronic debilitating inflammatory disease of unknown aetiology that is familiar to most practitioners in urology and urogynaecology. Due to it is frequent association with negative behavioural, sexual or emotional experiences, as well as with symptoms suggestive of lower urinary tract and sexual dysfunction. Surgical intervention is reserved for the most severe refractory cases, and includes subtotal cystectomy, orthotopic neobladder formation, total cystectomy and urinary diversion. However, to date, there is no consensus on patient selection for surgery or the optimal surgical

approach. We aimed to systematically review the available literature, and evaluate the evidence relating to safety and efficacy of surgical interventions for treating BPS/IC.

STUDY DESIGN, MATERIALS AND METHODS

A systematic search of the PubMed and Scopus databases was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) (fig.1)

Published studies were searched for using the search terms "interstitial cystitis AND surgery", and "bladder pain syndrome AND combined with the terms cystectomy and surgery. Articles were reviewed and screened by three independent reviewers. A total of 20 studies met the inclusion/exclusion criteria. The results were tabulated, and classified by surgical technique.

RESULTS

A total of 450 subjects were identified from the 20 eligible studies (1990-2017): mean age 54.5 years: 406 female patients (90.2%): 44 male patients (9.8%). The median duration of symptoms pre-operatively was 60 months (range 9-84), with median follow-up 49.4 months. The NIDDK diagnostic criteria were used in 11 studies totaling 240 patients (53.3%): the remaining patients were diagnosed using other clinical criteria. A total of 448 patients underwent surgery: 218 subtotal cystectomy with augmentation (48.6%); 98 cystectomy and orthotopic neobladder (21.9%); 40 cystectomy and ileal conduit (11.2%); and 82 urinary diversion only (18.3%). Satisfactory symptomatic improvement occurred in 77.2%. Rates were highest in the total cystectomy and orthotopic neobladder group (94.9%). A total of 31 patients (6.9 %) required a secondary procedure (i.e. total cystectomy and/or ileal conduit diversion): 48.4% had subsequent symptomatic improvement. Seventeen studies (357 patients) reported complication rates: 102 complications were reported overall (26.5%), with post-operative sepsis being the most common (26.6%). Mortality occurred in 5 patients (1.4%).

INTERPRETATION OF RESULTS

Total cystectomy with orthotopic neobladder appears to offer the highest rate of satisfactory symptomatic improvement following surgery; whilst urinary diversion alone produces the lowest rate. This may be attributed to recurrent/residual disease in the remaining bladder. Despite this, surgical intervention of any kind offers symptomatic improvement and patient satisfaction greater than 60%. Interpretation of this data should be guarded, however, given the low patient numbers and variable outcome measures used.

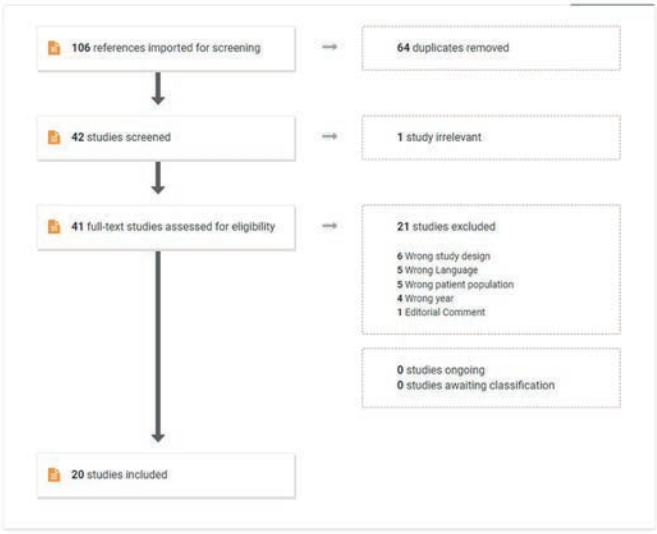
CONCLUDING MESSAGE

To our Knowledge this is the first systematic review that analyses all major open surgical techniques for treating Interstitial Cystitis/Bladder pain syndrome. The choice of operation for patients within this cohort remains a topic of debate and one which we cannot categorically recommend in this review. There is a clear need for prospective studies and randomisation of patients to fully differentiate between total cystectomy and bladder conserving procedures. However, the data suggests that in all instances, total removal of the bladder may yield more favourable long-term results in patients who do not have typical end-stage disease, and reduces the risk of requiring a secondary procedure. Interpretation of this data should be guarded given the relatively low patient numbers, risk of selection bias and lack of a consensus on diagnostic criteria. Ultimately the decision to operate and the best procedure to perform should be a joint MDT decision that takes into account patients choice on continence, self-catheterisation, body image and the risk of complications for a syndrome that is fundamentally benign. Ultimately, any procedure offers over a 60% chance of success and for some patients who have exhausted all other therapy, this may be a viable option. We have to keep in our minds that the management of patent expectations throughout this process is as important as the pre, peri and post-operative clinical management and should remain central in the treatment of BPS.

FIGURE 1

Operation	Total	Total Percentage	Symptomatic Improvement	No Improvement
Total + orthotopic	98/448	21.90%	94.90%	5.10%
Total cystectomy + Diversion	50/448	11.20%	82%	18%
Total cystectomy overall	148/448	33%	90.5%	9.5%
Subtotal + Augmentation/orthotopic	218/448	48.60%	73.40%	26.60%
No Cystectomy + Diversion	82/448	18.30%	63.40%	36.60%
Subtotal/no cystectomy overall	300/448	67.4%	70.7%	29.3%

FIGURE 2



Funding No **Funding Clinical Trial** No **Subjects** None

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EVALUATION OF SELF INSTILLATION OF CHONDROITINE SULFATE VERSUS INSTILLATIONS GIVEN BY A DEDICATED NURSE IN THE TREATMENT OF PATIENTS SUFFERING FROM BLADDER PAIN SYNDROME

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HYPOTHESIS / AIMS OF STUDY

Instillation of chondroitin sulphate (CS) in the bladder is one of the cornerstones in treatment of Bladder Pain Syndrome (BPS). CS is instilled into the bladder via a catheter and contributes to the repair of a defective GAG layer. Treatment is administered in weekly sessions over a course of 6 weeks. Many hospitals let patients come to the institution and have a nurse do the catheterization and instillation (nurse provided instillation, NPI). We have for several years taught patients to perform clean intermittent self catheterization (CISC) and let them do self instillations (SI) in their own home. We have, however, never evaluated the treatment systematically.

To find out if treatment results depend on whether patients do SI or NPI and to evaluate whether patients had any preference at the end of treatment. Finally we wished to estimate possible differences in resources spent for both patients and nurses.

STUDY DESIGN, MATERIALS AND METHODS

The study was a randomized cross-over study with a treatment period of 12 weeks. Patients were randomized to either 6 weeks SI followed by 6 weeks NPI (SI/NPI group) or 6 weeks NPI followed by 6 weeks SI (NPI/SI group). Before starting SI patients were trained in accordance with the department´s instructions on CISC during their first visit. Patients were allowed to contact our clinic at any time during the treatment period. During NPI patients came to the clinic once every week. Twenty patients were included in the study, ten in each group.

All patients kept a daily record of pain, urgency and number of daily voiding. Upon inclusion in the study, patients filled in a questionnaire. This was filled in again after 6 and 12 treatments. For the evaluation of possible treatment differences between NPI and SI treatment results were evaluated after the initial six weeks. For the evaluation of the remaining parameters results after 12 weeks' treatment were used

RESULTS

Fifteen of twenty included patients completed the study. One was excluded due to inability to be taught CISC. Two were excluded since they did not want to do NPI after having done SI. Two were excluded due to other reasons.

Treatment effect was lower in the SI/NPI group after 6 weeks as seen in Table 1. Pain score in the NPI group was reduced from 2.7 to 1.3 on a pain VAS scale, whereas pain score was reduced from 3.1 to 2.4 in the SI group. Similar results were seen regarding changes in urgency and number of voiding.

Seven of the SI patients had a contact to the clinic by phone all were due to urinary tract infection (UTI). This consultation lasted on average 15 minutes. These telephone contacts were all in the beginning of the SI treatment. No patients contacted the clinic or experienced a UTI during their NPI treatment period.

All patients reported that they felt safe doing SI and were well-informed regarding the SI procedure. Time spent for the patients on the SI procedure was on average 10 (range 5 – 15) minutes and for NPI 120 (range 60 – 180) minutes, this was including transportation. This means that patients spent 720 minutes on 6 NPI treatments as opposed to 60 minutes when performing SI.

The time spent by nurse during NPI is 30 minutes per treatment adding up to 180 minutes for 6 treatments. When teaching patients CISC and SI 60 minutes are spent for the first treatment. This means that letting patients perform SI reduces nurse resources by 120 minutes per patient.

After 12 weeks´ treatment all patients were asked to report which treatment modality they would prefer. All preferred to do SI and for all patients this was due to the shorter time spent on SI compared to NPI.

INTERPRETATION OF RESULTS

It appears that NPI give better treatment results than SI when looking at self-reported bladder symptoms like pain, urgeny and number of voidings. The better treatment results are, however, not reflected in results regarding treatment satisfaction and patients' preferences regarding treatment modality. All patients preferred to do SI as opposed to NPI despite the better treatment results and the possibility of having a consultation with a health care professional when given the NPI. UTI is a complication related to SI, probably indicating a learning curve for the patients performing CISC

CONCLUDING MESSAGE

In a public health care system resources are limited and it is therefore an interesting finding that SI is preferred by patients and can be performed in a safe and satisfactory way. SI offers a substantial reduction in resources and time spent for both patients and nurses. There is, however, a difference in treatment results in favour of NPI. A low treatment effect on general, independent of treatment modality, might explain why patients prefer SI despite the poorer treatment results.

FIGURE 1

Table 1, treatment results. Symptoms after 6 weeks compared to pre-treatment symptoms. (Visual Analogue Scale range 0 – 10).

	NPI	SI
	start – > after 6 weeks	start -> after 6 weeks
Bladder pain	2.7 -> 1.3	3.1 -> 2.4
Urgency	4.4 -> 2.6	4.2 -> 4.0
No.of voidings	9.6 ->8.8	12.2 -> 11.5

Funding Chondroitin sulfate for the patients was funded by Navamedic ASA, Fornebuveien 42-44, P.O.Box 107, N-1325 Lysaker, Norway **Clinical Trial** Yes **Public Registry** No **RCT** Yes **Subjects** Human **Ethics not Req'd** We sent the protocol to our local EC and received the answer that approval was not necessary **Helsinki** Yes **Informed Consent** Yes

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USEFULNESS OF LONG-TERM DIETARY MANIPULATION FOR FEMALE PATIENTS WITH PAINFUL BLADDER SYNDROME/INTERSTITIAL CYSTITIS.

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HYPOTHESIS / AIMS OF STUDY

Painful bladder syndrome/Interstitial cystitis (PBS/IC) is a clinical syndrome characterized by urinary frequency,

increased micturition frequency, urinary urgency, and bladder and pelvic pain. The causes of PBS/IC are not fully understood, and the condition is often difficult to treat. There are no established diagnostic criteria for PBS/IC, and

this has hampered the understanding of the underlying mechanisms and the development of diagnostic and treatment

methods. Bladder hydrodistention and resection or coagulation of Hunner's lesion should be considered after treatment failure of multimodal conservative treatments. However, there is currently no established treatment for

PBS/IC. Given the situation, complementary and alternative medicine (CAM) therapies such as behavioral therapy, physical therapy, stress reduction, and dietary manipulation (DM) can be potential treatment options. This study investigated the effect of a 1.5-year intensive systematic DM (ISDM) in women with stable PBS/IC.

STUDY DESIGN, MATERIALS AND METHODS

The study included 40 female patients (age 26-87 years; 62.3 ± 2.1 [mean ± standard error]) with PBS/IC in stable condition (duration of disease: 1.9-9.0 years; 5.3 ± 0.3).

In cooperation with the nutrition control team, we developed an original PBS/IC diet (1,500 kcal, 65 g protein, 40 g fat, 220 g carbohydrate, 1,000 ml water, 7 g salt). Data regarding daily food intake and food-related symptoms were collected by conducting a detailed interview of each patient, and we set meal menu to control PBS/IC symptoms and advised

the patients to reduce the intake of specific food items to the maximum possible extent. The following food items were removed from or restricted in the diet of patients: tomatoes, tomato products, soybean, tofu product, spices, excessive potassium, citrus, high-acidity-inducing substances, etc. We randomly assigned 30 patients to group A with instructions to follow this diet for 1.5 years (intensive systematic dietary manipulation: ISDM), and 10 patients to group B without instructions (non-intensive dietary manipulation: NIDM). We prospectively studied changes in the O'Leary-Sant Symptom Index and Problem Index (OSSI/OSPI), urinary urgency visual analog scale (VAS) score (U: 0, no urgency; 9, severe urgency), bladder/pelvic pain VAS score (P: 0, no pain; 9, worst possible pain), and quality of life (QOL: 0, very satisfied; 6, very unsatisfied) from before the start of treatment to 1.5 years after treatment. The clinical research was started after obtaining the approval from the ethics committee of our hospital. A written informed consent form was obtained from the patients after a full explanation of the purposes and procedures of the study. Statistical analysis was performed by using a t test. The significance level was set at $P < .05$.

RESULTS

No significant difference was observed in the background factors of both groups at the start of DM (Table 1). Group A showed significant improvement in all assessment items in the first 3 months after the start of treatment, and further significant improvement at 1 and 1.5 years ($p<0.0001$ for both). Group B showed no significant improvement in the first 3 months or at 1 year after the start of treatment; moreover, a worsening trend was observed in OSSI/OSPI and U at 1.5 years (Table 2). In addition, 6 patients in group A who received amitriptyline (100 ± 12.9 mg) before the start of DM successfully reduced the dose (58.3 ± 5.3 mg) by 1 year after treatment, while 2 patients in group B could not reduce the dose (87.5 ± 12.5 mg) after DM.

INTERPRETATION OF RESULTS

ISDM relieves various symptoms of PBS/IC and improves QOL over the long term and may also reduce the need for other treatments.

CONCLUDING MESSAGE

ISDM as one of the conservative treatment modality for PBS/IC should be attempted more strictly because of its noninvasiveness, without alterations to the other treatments.

FIGURE 1

Table 1 Patient Characteristics (ISDM and NIDM group)

		ISDM group	NIDM group
Case		30	10
Age (Mean ± SE)		62.2 ± 0.4	64.6 ± 1.5
Comorbidity			
	Osteoporosis	9	3
	Hypertension	6	2
	Sjögren's syndrome	5	2
	Diabetes melliitus	3	1
	Irritable bowel syndrome	3	1
	Rheumatoid arthritis	2	1
	Hip osteoarthritis	1	0
	Sarcoidosis	1	1
	Cystocele	1	0
	Fibrous myalgia	1	1
	Asthma bronchiale	1	1
	Lumbar disc hernia	1	0
	Interstitial pneumonia	1	1
	Polymyalgia rheumatica	1	1
	Hyperuricemia	1	0
	Hyperthyroidism	1	0
	Hyperlipidemia	1	0
Disease duration (years)		5.0 ± 0.1	6.1 ± 0.2

Data: mean ± standard error, ISDM: intensive systematic dietary manipulation, NIDM: non-intensive dietary manipulation

FIGURE 2

Table 2 Clinical effects of ISDM and NIDM

ISDM/NIDM	OSSI	OSPI	U	P	QOL
(a) Before: ISDM/NIDM	11.8 ± 0.7 / 11.2 ± 1.4	10.8 ± 0.6 / 10.3 ± 1.3	6.4 ± 0.3 / 6.0 ± 0.5	6.2 ± 0.3 / 6.0 ± 0.6	5.1 ± 0.2 / 5.3 ± 0.2
(b) After 3M: ISDM/NIDM	9.8 ± 0.6 / 10.6 ± 1.3	8.8 ± 0.5 / 10.0 ± 1.3	5.1 ± 0.3 / 5.7 ± 0.6	4.8 ± 0.3 / 6.1 ± 0.4	3.9 ± 0.2 / 5.2 ± 0.2
(c) After 1 year: ISDM/NIDM	8.7 ± 0.5 / 9.6 ± 1.1	7.7 ± 0.5 / 9.5 ± 1.1	4.6 ± 0.3 / 5.9 ± 0.3	4.0 ± 0.3 / 6.1 ± 0.3	3.1 ± 0.1 / 4.8 ± 0.2
(d) After 1.5 year: ISDM/NIDM	8.2 ± 0.5 / 10.5 ± 1.2	7.1 ± 0.4 / 10.3 ± 0.9	4.1 ± 0.2 / 6.6 ± 0.4	3.5 ± 0.2 / 6.5 ± 0.4	2.5 ± 0.1 / 5.1 ± 0.2
p value: ISDM/NIDM	<0.0001*/NS**	<0.0001*/NS**	<0.0001*/NS**	<0.0001*/NS**	<0.0001*/NS**

Data: mean ± standard error, ISDM: intensive systematic dietary manipulation, NIDM: non-intensive dietary manipulation, *p* value: *; (a) vs. (b), (b) vs. (c), and (c) vs. (d) as ISDM, **; (a) vs. (b), (b) vs. (c) as NIDM, NS: not significant

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Funding None **Clinical Trial** Yes **Public Registry** No **RCT** Yes **Subjects** Human **Ethics Committee** The ethics committee of Kobe Medical Center **Helsinki** Yes **Informed Consent** Yes

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NOCICEPTIVE PAIN HAS A HIGH PREVALENCE IN PATIENTS WITH PRIMARY BLADDER NECK OBSTRUCTION

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HYPOTHESIS / AIMS OF STUDY

Primary bladder neck obstruction (PBNO) is an under-investigated urological condition characterized by incomplete relaxation or over activity of urethral sphincters [1]. The etiopathogenetic mechanisms of this pathology are multifactorial and not adequately investigated. A multidisciplinary investigation and pain evaluation of PBNO patients could increase the comprehension of this disorder including potentially involved extra-urological factors. The aim of this study was to verify if chronic pain can be associated with PBNO symptoms.

STUDY DESIGN, MATERIALS AND METHODS

Consecutive male patients affected by PBNO were considered in the present study. A complete clinical pain evaluation and provocative test were performed to determine a pain diagnosis. During a provocative test, the physician performed a specific physical maneuver in an attempt to recreate the pain. A positive result means the test recreated pain. A combination of many tests are commonly used because a single test is not as sensitive and specific enough to confirm a diagnosis. Pain assessment was mainly focused on pelvic area and lumbar spine. Moreover, potential sources of pain due to nerve entrapments were assessed both clinically and by ultrasound examination. After a clinical examination, only a suspected diagnosis was made and anesthetic blocks under ultrasound guidance were used as subsequent steps for a correct diagnosis of the involved tissue. The anesthetic block test was considered positive if a >50% pain reduction was obtained. Any confounding factor as neurological disorders, diabetes, previous lower limbs and low back surgery were considered as exclusion criteria. A clinical postural assessment was integrated at the end of the pain examination to evaluate if incorrect posture induced stress on muscles, bones, and joints.

RESULTS

72 male patients with PBNO were evaluated. Pelvic pain was reported in a relevant percentage (76%) of the enrolled subjects. Pain onset was extremely variable (12.64±10.87 months, mean±SD). Regional pain distribution involved many different area: lumbar muscles or vertebrae, sacroiliac joint, hip, coccyx, pubic bones and pelvic muscles. Myofascial pain or articular pain was prevalent.

The most common type of pain was nociceptive (85%), while neuropathic pain was found only in 5% of the studied patients with the involvement of iliohyoigastric-ilioinguinal, genitofemoral or pudendal nerve.

A postural impairment characterized by increased lumbar lordosis, abnormal hip elevation, abnormal foot muscle mechanics without morphological abnormalities, sacrum rotation or altered postural control in response to external stimuli was found in more than 60% of the evaluated patients.

INTERPRETATION OF RESULTS

To our knowledge, no studies have attempted to evaluate the prevalence of pain in PBNO patients. Hypertonic pelvic floor muscles were associated with bladder dysfunction in previous studies [2-3], probably because of compressive forces on pelvic joints and coccyx. All these mechanisms may lead to urinary sphincters hypercontraction and to the development of urinary voiding symptoms without significant morphological alterations. Moreover, in healthy sub-

jects, the activation of the sympathetic nervous system (SNS) usually suppresses pain by descending inhibition of nociceptive transmission in the spinal cord. Otherwise peripheral inflammation and chronic pain can enhance nociceptor activation conducing to spinal facilitation and sensitization. The induced SNS hyperactivation caused by chronic pain, especially if nociceptive, can be implicated in internal sphincter closure and inhibition of the contraction of the bladder wall musculature.

CONCLUDING MESSAGE

Pain represents a relevant component of the initial clinical presentation of PBNO patients and has a high prevalence in these patients. A complete knowledge of PBNO should include an accurate pain evaluation with the treatment of the underlying disease in order to better manage these complex patients.

REFERENCES

1. Nitti VW et al, Primary bladder neck obstruction in men and woman. Rev Urol 2005; 7:A12-7
2. Essendrop M, Trojel Hye-Knudsen C, Faber Hansen A et al, Fast development of high intra-abdominal pressure when a trained participant is exposed to heavy, sudden trunk loads. Spine (Phila Pa 1976). 2004 Jan 1;29(1): 94-9
3. Shirley D, Hodges PW, Eriksson AE et al, Spinal stiffness changes throughout the respiratory cycle. J Appl Physiol (1985). 2003 Oct;95(4): 1467-75

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Maugeri **Helsinki** Yes **Informed Consent** Yes

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DOES THE REPEATED HYDRODISTENSION WITH TRANSURETHRAL COAGULATION FOR INTERSTITIAL CYSTITIS WITH HUNNER LESIONS CAUSE BLADDER CONTRACTION?

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HYPOTHESIS / AIMS OF STUDY

For interstitial cystitis (IC) with Hunner lesions, transurethral resection or coagulation (TUR/TUC) is recommended in AUA Guideline. It causes an obvious effect, although recurrence is highly possible. As bladder contraction is one of the troublesome problems after repeated TUR and TUC, even experts believe that repeated surgeries should not to be done to avoid bladder contraction. However, in my experience, repeated hydrodistension with TUC did not cause bladder contraction. We evaluated the effects and the side effects of repeated hydrodistension with TUC for IC with Hunner lesions.

STUDY DESIGN, MATERIALS AND METHODS

Forty-four IC patients with Hunner lesions underwent a total of 119 operations, from July 2005 to Sept. 2017. Forty-two were women. There were 20 patients who underwent surgery twice (group S), 17 patients at 3 times (group T) and 7 patients at 4 times (group F).

The maximum bladder capacity during hydrodistension was measured.

Patients were routinely followed up at months 2, 6, 12 after operation. Efficacy was assessed at these time points by O'Leary Sant symptom and problem scores, pain intensity on 0 to 10-point VAS, and 4 day's frequency volume chart (FVC).

RESULTS

The maximum bladder capacity during hydrodistension of group S, T, F were 431±120ml, 440±142ml and 372±142ml, respectively. There were no significant differences between 3 groups.

Preoperative average 24-hour urinary frequency was 24.3 24.9 in the S group, 15.4 5.7 in the T group and 16.7 8.1 in the F group.

Preoperative average voided volume (AVV) was 96 42 ml in the S group, 121 48 ml in the T group ($p<0.01$) and 125 49 ml in the F group ($p<0.01$). There was a significant difference between the T or F group and S group. Preoperative maximum voided volume (MVV) was 165 65 ml in the S group, 176 64 ml in the T group and 125 49 ml in the F group. There were no significant differences between 3 groups.

Preoperative ICSI, ICPI and pain score on VAS were 15.5, 13, 7.5 in the S group, 13.2, 10.6, 6.2 in the T group and 13, 9.4, 6.4 in the F group. There was a significant difference between the T or F group and S group.

At 2 months after surgery, there were no significant differences in frequency, AVV and MVV between three groups. ICSI, ICPI and pain score on VAS were 6.9, 4.3, 2.6 in the S group, 5.4, 2.9, 1.2 in the T group and 4.6, 2.1, 1.0 in the F group. Pain score in the T group and ICSI, ICPI and pain score in the F group significantly decreased compared to the S group. There was no significant difference between T and F group.

At 6 months after surgery, frequency, AVV and MVV in the T group increased significantly compared to the S group. ICSI, ICPI in the T and F group decreased significantly compared to the S group. There was no significant difference in pain score between 3 groups.

At 12 months after surgery, AVV in the T and F group, and MVV in the T group increased significantly compared to the S group. ICSI in the T and F group, and ICPI and pain score in the T group decreased significantly compared to the S group.

INTERPRETATION OF RESULTS

Repeated surgeries contributed to improvement of symptoms and bladder capasity. They did not cause worsening of symptoms and did not reduce bladder capacity.

CONCLUDING MESSAGE

Repeated hydrodistension with TUC for recurrence IC with Hunner lesions improves symptoms. It was not a direct cause of bladder contractility and it rather resulted in increased bladder capacity. However, a coagulation that is too deep may give the muscle layer damage and cause the contraction of the muscle.

Funding No **Clinical Trial** No **Subjects** Human **Ethics not Req'd** It is a retrospective study and iformed concent was obtained from all patients. **Helsinki** Yes **Informed Consent** Yes

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THERAPEUTIC EFFECT OF REPEAT PLATELET-RICH-PLASMA INTRAVESICAL INJECTIONS FOR IC/BPS REFRACTORY TO CONVENTIONAL TREATMENT

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HYPOTHESIS / AIMS OF STUDY

Interstitial cystitis/bladder pain syndrome (IC/BPS) is a disease of unknown etiology characterized by frequency nocturia and bladder pain. Although IC/BPS has been known for more than 100 years, current treatments are usually unsuccessful in achieving long-term bladder pain relief and irritable symptom improvement. Several intravesical or oral medications such as resiniferatoxin, pentosan polysulphate (PPS), amitriptyline, and cyclosporine have been tried, but the long-term therapeutic efficacy of these agents has not been proven. This study investigated the clinical efficacy of platelet-rich plasma (PRP) intravesical injection on patients with IC/BPS.

STUDY DESIGN, MATERIALS AND METHODS

Forty patients with IC/BPS received four monthly intravesical injections of 12 mL PRP extracted from 50 mL of the patient's whole blood. The primary end-point was the Global Response Assessment (GRA) at 3 months after the 4th PRP injection. Secondary endpoints included changes in O'Leary-Sant symptom score (OSS), visual analog scale (VAS) of pain, daily frequency, nocturia, functional bladder capacity (FBC), maximum flow rate, voided volume, post-void residual (PVR) volume from baseline to 3 months after the 4th PRP injection.

RESULTS

This study enrolled 40 patients (37 women and 3 men, aged 55.5±11.1 years) with cystoscopically proven IC/BPS. Patients received 4 intravesical injections of PRP every month, and were followed up at out-patient clinic at 1 month and 3 months after the last PRP injection. GRA improved after the 1st RP injection and the satisfaction persists till the primary end-point. The success rate was 45%, 57.5%, 67.6%, 72.0%, and 68.4% after the 1st, 2nd, 3rd, 4th, and 3 months after the 4th PRP injection, respectively. OSS and VAS also significantly decreased. The PVR did not change after repeated PRP injections, FBC increased and frequency and nocturia were decreased after PRP injections (Table 1). All patients were free of urinary tract infection and difficulty urinating.

INTERPRETATION OF RESULTS

The study results demonstrate that repeated intravesical injections of autologous PRP to increase bladder capacity and provide IC symptom improvement in patients with IC/BPS refractory to conventional therapy. Autologous PRP injection is safe and effective in selected patients. Although this pilot study lacked a placebo control, the improvements in IC/BPS symptoms and FBC after PRP treatment indicate the feasibility of such treatment for IC/BPS.

CONCLUDING MESSAGE

Repeated intravesical PRP injection is well tolerated and appears to be a safe and effective in medically refractive IC/BPS and provides significant symptom improvement.

FIGURE 1

Table 1. Global response assessment (GRA) of treatment, symptom score, and frequency volume records from baseline to 3 months after 4th PRP injection

	Baseline (1st PRP)	2nd PRP	3rd PRP	4th RP	1M after th PRP	3M after 4th PRP
GRA	0	1.23±1.17*	1.57±0.98*	1.76±0.96*	1.67±1.05*	1.84±0.83*
VAS	3.42±2.93	2.18±2.09*	1.97±2.29*	1.41±1.79*	1.21±1.64*	1.05±1.87*
OSS	18.8±7.23	14.8±6.73*	13.3±6.44*	12.6±7.00*	12.3±5.56*	10.6±6.76*
ICSI	8.85±3.88	7.05±3.57*	6.25±3.11*	5.68±3.51*	5.71±3.11*	5.58±3.53*
ICPI	9.73± 3.73	7.78± 3.68	7.07± 3.88	6.88± 4.18	6.58± 3.35	5.00± 3.50
Frequency	13.1±7.26	11.0±5.09	11.6±5.44	10.7±4.48*	10.3±3.73*	10.3±3.83*
Nocturia	2.45±1.26	2.48±1.22	2.20±1.04	1.91±1.10*	1.96±1.08*	2.05±1.43*
FBC (mL)	296±134	313±114	314±119	316±119*	326±101*	317±77.4
CBC (mL)	287±124	242±134*	196±96.7	284±128	218±108	275±120
Qmax(mL/s)	10.2±5.95	17.0±9.96*	16.5±10.4*	11.5±5.80*	20.4±13.2*	26.8±14.1*
Volume(mL)	216±109	221±130	171±93.5*	237±132	191±104	258±120
PVR (mL)	60.3±135	23.3±29.6	25.0±32.5	49.7±95.8	27.1±34.0	16.4±16.0

PRP: platelet rich plasma, OSS: O'Leary-Sant Score, ICSI: interstitial cystitis symptom index, ICPI: interstitial cystitis problem index, VAS: visual analog score, FBC: functional bladder capacity.

* Significant difference from the baseline data

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** Yes **Subjects** Human **Ethics Committee** Research **Ethics Committee**, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation **Helsinki** Yes **Informed Consent** Yes

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WHAT ARE THE MOST EFFECTIVE INTERVENTIONS FOR TREATMENT OF BLADDER PAIN SYNDROME/INTERSTITIAL CYSTITIS? A NETWORK META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS

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HYPOTHESIS / AIMS OF STUDY

Bladder pain syndrome (BPS) is a poorly understood bladder condition. According to the International Continence Society (ICS), BPS is defined as the complaint of suprapubic pain related to bladder filling, accompanied by other symptoms such as increased daytime and night-time frequency, in the absence of proven urinary infection or other obvious pathology.[1] BPS is also defined by the European Society for the Study of Interstitial Cystitis/Bladder Pain as pelvic pain, pressure or discomfort perceived to be related to the bladder, lasting for at least 6 months, and accompanied by at least one other urinary symptom.[2]

There is currently no definitive cure for BPS but a large number of treatments which aim to alleviate symptoms are employed with limited evidence. Previous research is hampered by its focus on numerous pairwise comparisons, which makes it difficult to identify the most effective treatments. This study aimed to bring together evidence for all available treatments that have been assessed in randomised controlled trials (RCT) by means of a network meta-analysis (NMA), which allow simultaneous comparisons of multiple interventions.

STUDY DESIGN, MATERIALS AND METHODS

We performed a NMA based on a systematic review of RCT of interventions for BPS in adults. RCTs were identified from existing Cochrane reviews and literature searches based on the Cochrane Incontinence Group Specialised Register, which contains trials identified from the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, MEDLINE In-Process, MEDLINE Epub Ahead of Print, ClinicalTrials.gov, WHO ICTRP and hand-searching of journals and conference proceedings. Searches were performed on 3 October 2017. We also perused the reference lists of relevant identified articles. We sought any intervention (conservative, pharmacological or surgical) which aims to alleviate symptoms in adults with BPS, interstitial cystitis (IC) or painful bladder syndrome, accepting the various clinical terms used to identify this clinical condition in the literature. Urethral syndrome was excluded. Valid comparators were placebo, sham, control or another treatment. Primary outcomes were patient-reported improvement, pain, frequency and nocturia at 12 months. Secondary outcomes included Interstitial Cystitis Symptom Index (ICSI), Interstitial Cystitis Problem Index (ICPI), functional bladder capacity and adverse events. Risk of bias of the included studies was assessed using the Cochrane risk of bias tool for RCTs. For each outcome random effects NMA models were fitted using WinBUGS 1.4. Three chains were used and models were run with a burn-in of 20,000 iterations and then for a sample of 30,000 iterations. Results for each treatment category were monitored versus control.

RESULTS

The review included 81 RCTs. Most included studies had small sample sizes (<50) with a short follow-up. Only six studies had a follow-up of 12 months or longer. Sample sizes ranged from 10 to 369 participants, with a median of 38. Follow up time ranged from 0 to 27 months, with a median of 3 months.

Included studies assessed 65 different active treatments, either alone or in combination. To simplify, these were grouped into 31 active treatment categories by mode of action, following treatment descriptions for BPS/IC by the 6th International Consultation on Incontinence wherever possible.[3] Included studies were of moderate to low quality with three-quarters of included studies being assessed as having unclear or high risk of bias on most bias domains. Reporting quality of existing trials was also generally poor. For example, the number of patients with available data and the definition of outcome measures were not consistently reported across studies.

Full results of the NMA will be available shortly, but provisional results for the proportion of patients cured are available. A network of 42 RCTs and 20 treatment categories was evaluated, but 13 treatment categories were represented by just one or two RCTs and 95% credible intervals were generally wide. There was evidence that three pharmacological treatment categories (anti-depressants, immune modulators, PDE5 inhibitors), one surgical category (neuromuscular blockade) and one conservative therapy (behavioural therapy) were effective versus control. Adverse events appear uncommon in most interventions assessed. Data on long-term outcomes were limited.

INTERPRETATION OF RESULTS

Some interventions appear to be more effective than others. However, there is considerable uncertainty around the estimates of effect. Longevity of treatment is unclear.

CONCLUDING MESSAGE

To the best of our knowledge, this is the largest NMA conducted to assess the effects of different interventions for the treatment of BPS. The number and size of available RCTs for each treatment category was small and there was a lack of clear evidence for the majority of treatments assessed, which rendered it difficult to draw firm conclusions. Larger, more focused trials are needed to improve the current evidence base.

REFERENCES

1. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardisation of terminology of lower urinary tract function: report from the Standardisation Sub-committee of the International Continence Society. Neurourol Urodyn 2002;21:167-78.
2. van de Merwe JP, Nordling J, Bouchelouche P, Bouchelouche K, Cervigni M, Daha LK, et al. Diagnostic criteria, classification, and nomenclature for painful bladder syndrome/interstitial cystitis: an ESSIC proposal. Eur Urol 2008;53:60-7.
3. Hanno P, Cervigni M, Dinis P, Lin A, Nickel JC, Nordling J, et al. Bladder pain syndrome. In: Abrams P, Cardozo L, Wagg A, Wein A, editors. Incontinence: 6th International Consultation on Incontinence, Tokyo, September 2016. Bristol, UK: International Continence Society (ICS) and International Consultation on Urological Diseases (ICUD); 2017:2206-301.

Funding NIHR (National Institute for Healt Research, UK) - Cochrane Incontinence Grant **Clinical Trial** No **Subjects** Human **Ethics not Req'd** It is secondary research (systematic review) and uses data from published studies. **Helsinki** Yes **Informed Consent** No

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ANXIETY SCORE DOES NOT INFLUENCE TREATMENT OUTCOME IN PATIENTS WITH INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME

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HYPOTHESIS / AIMS OF STUDY

Interstitial cystitis/bladder pain syndrome (IC/BPS) is a chronic syndrome of unknown etiology characterized by urgency, frequency and bladder pain without effective definite treatment. Patients always have moderate anxiety mood status. Physical and psychological status and treatment outcome are closely related. Anxiety is also the predecessor of depression. This study investigated the impact of anxiety severity on therapeutic results of IC/BPS patients.

STUDY DESIGN, MATERIALS AND METHODS

Seventy-five IC/BPS patients (68 female and 7 male) who received any kind of treatment were prospectively enrolled. The primary endpoint was changes of Beck's Anxiety Inventory (BAI) for anxiety mood before and 3 months after treatment. Secondary endpoints included the changes of Global Response Assessment (GRA), O'Leary-Sant score (OSS), and Visual Analog Scale (VAS). The clinical symptom scores were also compared with cystometric bladder capacity (CBC) under the urodynamic study.

RESULTS

All patients completed the study. The patients were divided into three groups according to their anxiety severity based on BAI: (1) 0-15 point (N=29, mean age, 52.3±13.3 years), (2) 16-25 point (N=19, mean age, 49.9±13.9 years), and (3) 26-63 point (N=27, mean age, 57.4±9.9 years, p= 0.113). The mean duration of IC symptoms was 97±75.2 months. Cystoscopic hydrodistention was performed in all patients, with a mean maximal bladder capacity (MBC) of 691±176 ml, and a mean glomerulation grade of 1.65±0.79. There was no significant difference of symptom duration, MBC and glomerulations among patient groups of different BAI severity. After treatment, the mean BAI decreased from 37.6±7.6 to 22.1±10.4 at 3 months in patients with severe anxiety score (P< 0.001). Patients with mild anxiety score did not show significant change in BAI after treatment. However, the improvement of ICSI, ICPI, VAS and GRA all showed significance after treatment in three groups, and there was no significant difference between groups. After treatment, Qmax improved only in BAI 0-15 points group (Table1). The changes of BAI after treatment was significantly associated with the changes of ICSI (r= 0.288), ICPI (r= 0.350), VAS (r= 0.300), and GRA (r= 0.347). The changes of BAI was associated with change of ICPI (r= 0.607), ICSI (r= 0.524) and VAS (r= 0.292). Among overall patients, 38(51%) had a GRA ≥2 after treatment. The BAI showed significantly improved in the patients with GRA≥2 (baseline, 23.7±13.2; 3M, 14.9±8.7, p< 0.01) but was not in patients with a GRA <2 (baseline, 21.8±12.5; 3M, 20.0±9.6, p= 0.01). We also found the change of VAS (baseline, 5.1±2.9; 3M, 1.8±2.0, p< 0.001), BAI (baseline, 22.0±14.1; 3M, 14.2±7.5, p= 0.05) and GRA (3M, 2.0±0.9, p< 0.001) significantly improved in the patients with change of OSS ≥7 points. Ultimately, when we predict the factors which affect the GRA by multiple linear regression, only OSS was significantly associated (β -.59, p < 0.05). Anxiety score, age, duration and VAS did not have significant association with the GRA after treatment (Table 2).

INTERPRETATION OF RESULTS

The results of this study suggest baseline BAI does not influence treatment outcome of IC/BPS. Regardless of the level of anxiety, IC/BPS patients had significant improvement in ICSI, ICPI, VAS, and GRA. The change of BAI was significantly greater in patients with a GRA ≥2. The improvement of GRA was mainly due to decrease of symptoms and problems of the bladder.

CONCLUDING MESSAGE

The improvement in physical and visceral distress symptoms of BAI is significantly associated with an increase of GRA after treatment, indicating that IC/BPS patients should be advised to receive regular and persistent treatment to achieve a better therapeutic outcome.

FIGURE 1

Table 1. Changes of measured parameters at baseline and after treatment

		BAI 0-15 (N=29)	BAI 16-25 (N=19)	BAI 26-63 (N=27)	P value between group
BAI	Baseline	11.1±3.0	19.2±2.6	37.6±7.6	.446
	3M	12.3±6.6	18.4±7.8	22.1±10.4***	
ICSI	Baseline	10.7±3.4	9.4±3.6	13.9±3.9	.537
	3M	8.0±4.0	6.8±3.6	8.7±4.5***	
ICPI	Baseline	10.5±4.1	9.6±3.7	12.9±3.1	.294
	3M	7.2±3.5***	7.7±4.8	8.5±4.8***	
VAS	Baseline	4.0±2.7	3.1±2.7	5.8±2.6	.809
	3M	2.0±1.8***	2.3±2.5	2.9±2.4***	
GRA	Baseline	0	0	0	.880
	3M	1.3±0.9	1.4±1.3	1.3±1.2	
Qmax (ml/s)	Baseline	13.1±8.4	14.0±7.1	17.2±6.8	.096
	3M	18.1±10.6**	14.0±7.0	17.6±9.0	
Volume (ml)	Baseline	202.9±118.4	221.6±86.0	209.4±79.7	.444
	3M	213.3±123.8	177.7±110.4	177.5±128.1	
PVR (ml)	Baseline	17.8±22.0	39.3±52.7	32.1±50.6	.051
	3M	21.9±37.2	19.1±28.9	44.4±58.5	
CBC (ml)	Baseline	220.7±121.4	261.0±92.5	238.8±114.6	.376
	3M	235.2±133.0	207.0±130.5	221.7±146.0	

*p< .05; **p< .01; ***p< .001

BAI: Beck's anxiety inventory, ICSI: interstitial cystitis symptom index, ICPI: interstitial cystitis problem index, OSS: O'Leary-Sant symptom score, VAS: visual analog score, GRA: global response assessment, Qmax: maximum flow rate, PVR: post-void residual volume, CBC: cystometric bladder capacity.

FIGURE 2

Table 2. Predicting Multiple Regression Analysis Impact GRA

Characteristics	β coefficient	p value	95% CI	
(constant)	.200	.704	-.848	1.248
Moderate Anxiety	.457	.121	-.124	1.038
Severe Anxiety	-.248	.364	-.790	.294
Age	.009	.339	-.010	.029
Duration	.001	.710	-.003	.004
OSS	-.083	<.001***	-.114	-.052
VAS	-.023	.612	-.111	.066
CBC	.002	.047*	.000	.004

*p< .05; **p< .01; ***p< .001

R^2=.43 , Adj. R^2=.36 , F=6.09 , p=.000

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Research **Ethics Committee**, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation **Helsinki** Yes **Informed Consent** Yes

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URODYNAMIC STRATIFICATION OF ELDERLY MALE PATIENTS WITH SYMPTOMS OF LOWER URINARY TRACT DYSFUNCTION; A MEDICAL SEPECIALISTS GRADING AND STAGING OF DISEASE.

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HYPOTHESIS / AIMS OF STUDY

Urodynamic grading of bladder outflow obstruction for elderly male with prostate enlargement is (ICS) standardized since 1997.(1) A clinical disease specific nomogram is available to graphically display the pressure flow relation.(2) This nomogram has been the basis for the ICS bladder outflow obstruction index (BOOI) and the ICS bladder contraction index (BCI). Elderly men with symptoms of lower urinary tract dysfunction (LUTS) have a significant chance that bladder outflow obstruction (BOO) is the cause. The growing prostate creates a slowly increasing resistance to the outflow tract, however the resistance is not exactly proportional to the size of the prostate. On the other hand, a reduced flowrate may be caused by an underactive detrusor contraction. Both, flowrate (including PVR) and prostate size have an intermediate sensitivity and specificity with regard to the gold standard diagnosis. Guidelines support the management of LUTS on the basis of subjective expression and interpretation of symptoms plus flowrate maximum. Urodynamic testing is avoided in practice for many reasons and therefore maximum free flowrate is commonly used as the predominant (or only) objective test to grade the dysfunction responsible for the symptoms. We have therefore precisely studied flowrate in comparison with pressure flow outcome and have explored the consequences of diagnosis, on the basis of flowrate, or on urodynamics in nearly 2500 men.

STUDY DESIGN, MATERIALS AND METHODS

We analysed 2459 men >45 year with LUTS. All these -consecutive- patients were referred and had bothering symptoms. Urodynamic pressure flow test was done after ICS standard cystometry and in the patients preferred position. We have not excluded measurements, but patients without free flow before urodynamics were not included. Pressure flow result is shown per linearized passive urethral resistance class (LinPURR) and per nomogram contraction class. Free flow study was produced by all included patients just before the cystometry. Not always representative (as reported by the patient), nevertheless all results (with volume over 50mL) were included, to present the most naturalistic set of patients.

RESULTS

The graphs show (upper left) that for the total group of patients absence of BOO (combining OBS grade 0 1 and 2, vertical) with reduced contractility (combining very weak and weak contraction classes) was present in 37.7% of patients. In 34% of all patients contraction was normal or strong,

without BOO (< OBS 3). BOO was confirmed in 28.7% of all these men combined with weak contractility in 4.7%. BOO was severe (grade OBS 5 or 6) in 3.3% of the patients. If flowrate was <10mL/s (in 457 men), again, 38.7% of men had no BOO and weak contraction, and 22% of these men had no BOO and normal contraction. 39.2% of these men had BOO; 5.8% in combination with weak contraction and for 6.8% the BOO was graded severe. In the group with flowrate >14mL/s (338 men) only 3 had severe grade of BOO (1%) and 85.6% of these men had no BOO and 56.2% had normal contractility.

INTERPRETATION OF RESULTS

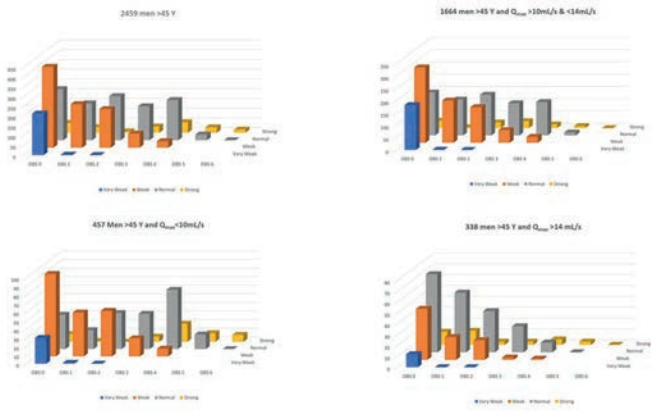
Flowrate is reduced in patients with BOO. Patients with a flowrate above 14mL/s rarely (14.4%) have BOO, which is virtually never high graded (1%). If the flowrate is <14mL/s roughly 35% of the patients has BOO and underactive detrusor. Of all patients with symptoms and flowrate 28,7% has BOO grade 3 or higher. If BOO grade >3 is taken as the threshold to advise surgical des-obstruction, only 3,3% of all patients would be advised positive for this. 71% of all patients would profit from conservative measures (with low intensity follow up) because no BOO is responsible for their symptoms, however >50% of these men without BOO has underactive detrusor, for whom no specific treatment is available. A proportion of men will have storage dysfunction (uncovered by the urodynamic testing), this is however not included in this analysis (that mimics the usual guideline practice advise). 25,5% of all men could safely continue, or start with specific medical treatment based on a moderate grade of BOO.

Conservative or medical management is usually safe and effective in elderly men with LUTD. However many men want reconfirmation of this when the treatment has been based on symptoms only (has been given ex-juvantibus). They persist anxiety and bother about their symptoms and ask for referral. Objective urodynamic stratification is the golden standard tool to diagnose the dysfunction and urologists are able to use this. ICS has been instrumental to develop the tools and techniques. As stated above: Many men can be reassured and may continue with conservative measures of medication on the basis of urodynamic grading of the dysfunction. Guidelines advise to consider des-obstruction for patients with persisting symptoms and reduced flowrate on the basis of indirect evidence, urodynamics would confirm this individually in around 30% of patients based on an objective measure.

CONCLUDING MESSAGE

Urodynamic objective grading and staging of the dysfunction, as developed by ICS, is very helpful in medical specialists perspective. Including urodynamic staging and grading of dysfunction in elderly male patients as a sine qua non in guidelines for medical specialist management would reduce unnecessary (potentially >60%) surgery in elderly men, referred with bothersome signs and symptoms of lower urinary tract dysfunction.

FIGURE 1



REFERENCES

1. Griffiths D, Höfner K, Mastrigt R van, Rollema HJ, Spångberg A, Gleason D: Standardization of Terminology of Lower Urinary Tract Function: Pressure-Flow Studies of Voiding, Urethral Resistance, and Urethral Obstruction. Neurourol and Urodynam 161-18 (1997).
2. Schäfer W. Analysis of bladder-outlet function with the linearized passive urethral resistance relation, linPURR, and a disease-specific approach for grading obstruction: from complex to simple. World J Urol. 1995;13(1):47-58. Review. PubMed PMID: 7773317.
3. Rosier PF, Kirschner-Hermanns R, Svihra J, Homma Y, Wein AJ. ICS teaching module: Analysis of voiding, pressure flow analysis (basic module). Neurourol Urodyn. 2016 Jan;35(1):36-8. doi: 10.1002/nau.22660. Epub 2014 Sep 11. PubMed PMID: 25214425.

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A NONINVASIVE UROFLOWMETER-CYSTOMETER (NUC), WHICH CAN MEASURE DETRUSOR PRESSURE AND IDENTIFY BOO WITHOUT USING A CATHETER

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HYPOTHESIS / AIMS OF STUDY

BOO (bladder outlet obstruction) is usually treated only after the patient presents with LUTS (lower urinary tract symptoms). However, by the time bothersome symptoms emerge bladder dysfunction may have progressed to the point where it may no longer be reversible. Using traditional invasive urodynamics to evaluate voiding function and bladder pressure is inconvenient for patient and practitioner, uncomfortable and frequently non-physiologic. We developed a device, which creates a closed system during voiding and thus measures bladder pressure without use of a catheter.

STUDY DESIGN, MATERIALS AND METHODS

A group of 33 male patients with known symptoms of BPH in a community practice were enrolled in this study. They were instructed to void into a device (NUC – Noninvasive Urtroflow-Cystometer), which is a closed airspace and can measure the pressure generated by the urine flow. This is possible by making a tight seal between the glans and the device by an intervening attachment called UED (urethral extender device). This creates a closed space between the meatus and the UED, by a mild negative suction pressure at the point of contact, with pressures between 150-300 mm Hg. The suction is created from a circular slit, which surrounds the opening into the measuring chamber.

The measuring chamber is able to analyze the backpressure created during voiding and generates pressure-time curves. This pressure is reflective of bladder pressure as the bladder pressure is exposed through an open urethra during voiding. When the back pressure reaches a preset level (i.e. – 30 mm Hg) a solenoid valve opens and releases the air displaced by the urine within the UED so the pressure returns to 0 mm Hg. This prevents an increase in backpressure in the bladder to the point of being noticeable or uncomfortable. The valve then closes and the process is repeated until the voiding is completed. Analysis of the pressure-time curves and the flow-pressure curves derived from the pressure-time curves, provides measure of urine flow rate (uroflowmetry), urethral resistance ("obstruction" to flow), bladder pressure (detrusor strength). The slope of the flow-pressure curves helps determine the relative contribution of urethral obstruction versus bladder weakness to diminished urine flow. When the flow-pressure curve is extrapolated to the X and Y-axes the maximum urine flow is noted at zero backpressure and the maximum bladder pressure extrapolates at zero flow (isovolumetric bladder pressure).

RESULTS

Each subject voided in the device at the sensation of full bladder (normals: n=2; patients: n=33). The graph below summarizes the data.

INTERPRETATION OF RESULTS

The data from our study identified easily 4 broad categories: normal subjects (normal flows, normal bladder pressures), compensated bladders (normal flows, high bladder pressures) decompensated bladders with reduced flows and lower pressures, and hypotonic bladders with reduced flows and reduced pressures. T-tests showed p values less than 0.001 for differences between the normal and the symptomatic subjects in all variables (flow, pressure and total volume).

CONCLUDING MESSAGE

The noninvasive uroflow-cystometer easily differentiated between normal and abnormal lower urinary tract function in men with bladder outlet obstruction and between distinct patient subpopulations. This device has the potential to significantly impact the standard of care for patients being evaluated for BPH with LUTS. The NUC identified obstructed subjects with normal flow that was the result of bladder pressure compensation, as well as obstructed subjects. This can lead to early medical intervention in the treatment of bladder changes related to bladder outlet obstruction.

FIGURE 1

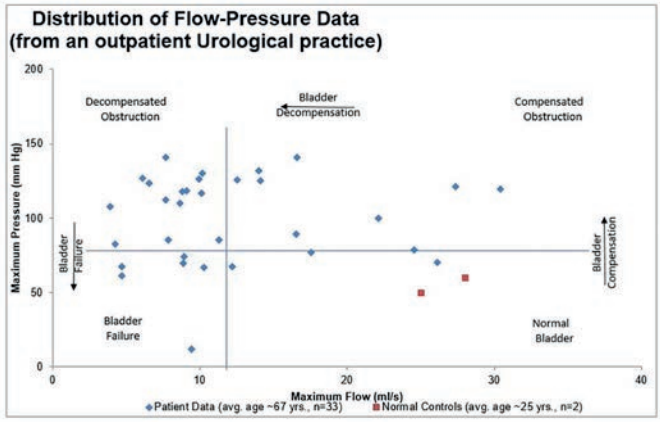
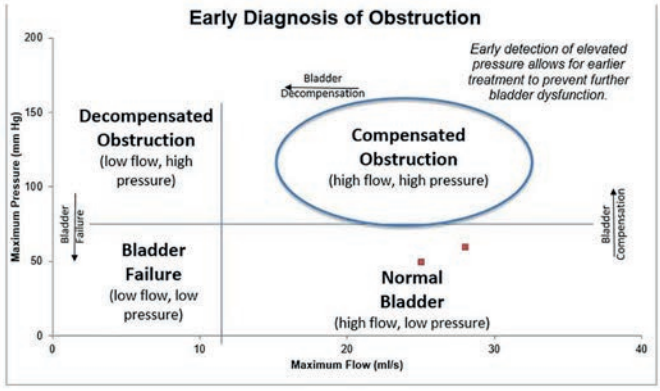


FIGURE 2



Funding BioFluid Technology **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Schulman Approved IRB #201607386 16th Feb 2017 **Helsinki** Yes **Informed Consent** Yes

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AUTOMATED QUANTIFICATION OF LOW AMPLITUDE RHYTHMIC CONTRACTIONS DURING URODYNAMICS IDENTIFIES INCREASING AMPLITUDE BUT NOT FREQUENCY WITH INCREASING VOLUME IN A SUBGROUP OF PATIENTS WITH DETRUSOR OVERACTIVITY

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HYPOTHESIS / AIMS OF STUDY

Detrusor overactivity contributes to overactive bladder in some patients and is diagnosed by visual identification of non-voiding contractions in pressure data from a urodynam-

ics (UD) study. These non-voiding contractions can be isolated, sporadic or periodic. The aims of the present study were 1) to implement a novel automated algorithm to objectively quantify low amplitude rhythmic contractions (LARC) during UD filling, 2) compare LARC frequencies and amplitudes at low and high volumes to quantify any changes that occur during filling and 3) determine whether participants with LARC at both low and high volumes correlated with a subgroup of patients with detrusor overactivity.

STUDY DESIGN, MATERIALS AND METHODS

UD pressure data from 95 adult patients were retrospectively analyzed by an automated Fast Fourier Transform (FFT) analysis algorithm. Three 205-second regions of interest (ROIs) were analyzed at low bladder volumes (beginning 0, 30 and 60 sec after the start of filling) and at high volumes (ending 0, 30 and 60 sec prior to the start of voiding) to identify three frequencies in the 1.75-6 cycles/minute range associated with the largest rhythmic amplitude peaks in vesical pressure (Pves) as shown in the example in Figures 1 and 2. Peak Pves amplitudes were analyzed to determine whether any significant rhythmic activity was present in Pves (Was there a peak in Pves?), and if that activity was independent of any rhythmic activity in the abdominal pressure (Pabd) (Was Pabd relatively flat compared to Pves?). Rhythmic frequencies and amplitudes were quantified for each patient in which significant and independent LARC were identified. The automated algorithm can analyze an individual UD study in less than 5 seconds, allowing for potential real-time data interpretation in the UD clinic.

RESULTS

A neurourologist/urodynamicist identified 52 out of 95 patients as having detrusor overacitvity based on a blinded analysis on the UD pressure data. The group identified with detrusor overactivity included 26 women and 26 men with an average age of 53±2 years, and included 28 individuals with neurogenic detrusor overactivity. The group of 43 participants without DO included 29 women and 14 men with an average age of 51±2 years.

The algorithm identified significant and independent LARC at both high and low volumes in 11 participants. All 11 of these participants were in the group identified with detrusor overactivity, resulting in a significant association (Fischer's exact test, p=0.0008) and a specificity of 100%. This group included 7 women and 4 men with an average age of 55±6 years, and included five individuals with neurogenic detrusor overactivity.

For the group of 11 participants identified with LARC at both low and high volumes, the slowest significant and independent LARC frequencies were not different at the low and high volumes (2.3±0.2 cycles/min and 2.6±0.4 cycles/min, respectively, n=11, p>0.05). However, the LARC amplitudes at the slowest frequencies nearly doubled, increasing from an average of 6.7±1.1 cm-H2O to an average of 12.0±2.5 cm-H2O (n=11, p<0.05) as the bladder volume increased.

INTERPRETATION OF RESULTS

The algorithm identified a subset of patients with detrusor overactivity (11 out of 52 = 21%) that exhibited quantifiable LARC throughout filling and developed greater LARC amplitudes at larger bladder volumes.

CONCLUDING MESSAGE

This automated algorithm demonstrated that LARC amplitude, but not frequency, increased with increasing volume in a subset of individuals with detrusor overactivity. The algorithm can be implemented to provide physicians with real-time quantification of any LARC during a UD study and will permit quantitative characterization of the development of LARC throughout the bladder filling phase. Furthermore, the algorithm could potentially be used to produce quantitative metrics to determine whether the degree of LARC (based on amplitude change from low to high volume) correlates with overactive bladder severity or response to treatment.

FIGURE 1

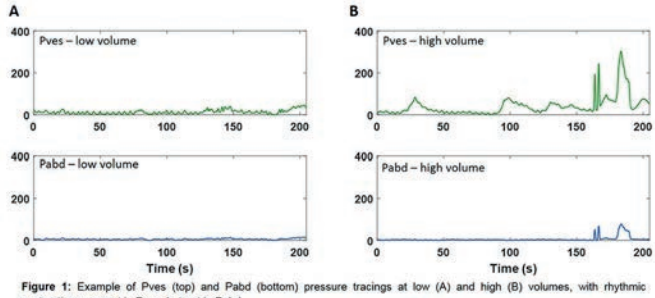

Figure 1: Example of Pves (top) and Pabd (bottom) pressure tracings at low (A) and high (B) volumes, with rhythmic contractions present in Pves, but not in Pabd.

FIGURE 2

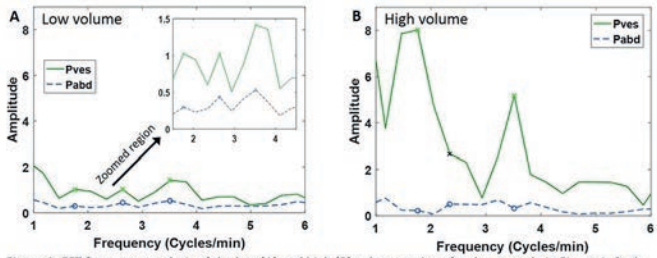

Figure 2: FFT frequency analysis of the low (A) and high (B) volume regions for the example in Figure 1. Both volumes have peaks at 1.75 and 3.5 cycles/min with significant increases in the amplitude at the higher volume

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IMPACT OF DIFFERENT SIZED CATHETERS ON UROFLOWMETRY AND PRESSURE FLOW STUDY IN ADULT MEN: A PROSPECTIVE RANDOMIZED STUDY

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HYPOTHESIS / AIMS OF STUDY

The aims of this study were twofold. A) To compare uroflowmetry parameters obtained during free uroflowmetry with those obtained during urodynamic pressure flow studies. B) To evaluate the effects of different size transurethral urodynamic catheters on pressure flow study parameters.

STUDY DESIGN, MATERIALS AND METHODS

This was a prospective, randomized, comparative study. Inclusion criteria: Consecutive adult males ≥18 years presenting to urology outpatient with lower urinary tract symptoms who, after initial work up were planned for urodynamic pressure flow study. Exclusion criteria: i) Patients with active UTI, hematuria, Bladder stones. ii)) Any positive history of stricture urethra, neurological illness, bladder/ prostatic malignancy. iii) Any prostate, bladder, urethral, meatal surgery or any endourolgical intervention or prior pelvic surgery. iv) If taking drugs likely to affect micturition, which could not be stopped, v) failure to void or voided volume less than 150 ml on free uroflowmetry, vi) refused to give informed consent

Eligible patients were randomized into one of two groups (Group 1, Group 2) using a computer-generated randomization table. No crossover was allowed after group allocation. Patients in group 1 underwent two urodynamic studies 45 minutes apart, one with a 5Fr catheter and the other with an 8Fr catheter. Patients in group 2 also underwent two urodynamic studies 45 minutes apart, but one with a 6Fr catheter and the other with an 8 Fr catheter. The order of catheter in group 1 (5Fr vs 8Fr) and 2 (6Fr vs 8Fr) were decided randomly. All urodynamic studies were performed in accordance with "Good Urodynamic Practice" recommendations of the International Continence Society. Those patients who i) could not void or voided less than 150 mL on urodynamic pressure flow study or ii) whose voided volumes in the free uroflowmetry and urodynamic pressure-flow studies varied by more than 30%, were subsequently excluded from study/analysis. Primary outcome measures for analysis included i)maximum flow rate (Qmax) ii) Pdet Qmax iii) Bladder outlet obstruction index (BOOI) and bladder contractility index (BCI). Statistical analysis was done with SPSS 20.0 (IBM SBSS20).

RESULTS

Of 184 patients screened, 128 patients were found eligible and were randomized to group 1 and 2 (64 each). Fourteen patients in each group were subsequently excluded leaving 50 patients in each group for analysis. The results are summarized in table 1 and 2.

INTERPRETATION OF RESULTS

All sizes of catheters used during pressure flow study (5Fr/ 6Fr/8Fr) significantly decreased Qmax when compared to Qmax obtained during free uroflowmetry. The impact of an 8Fr catheter was significantly more than a 5Fr or a 6Fr catheter with no significant difference between 5Fr and 6Fr catheter (Table 1) Similar results were noted for PdetQmax. An 8Fr catheter significantly increased PdetQmax when compared to either a 5Fr or a 6Fr catheter with no significant difference between 5Fr and 6Fr catheter. However, no significant upstaging was seen in terms of the number of patients who would be classified as true obstructed (BOOI index > 40) on using an 8Fr catheter when compared to a 5Fr or a 6Fr catheter. Similar findings were recorded using a cut off of 150 for BCI. (Table 2)

CONCLUDING MESSAGE

While catheters of different sizes significantly decrease Qmax when compared to free Qmax from a statistical standpoint, the catheter size (between a 5/6/8Fr) did not significantly alter the BOOI / BCI index and so all three catheter sizes would provide similar information to the clinician from a "urodynamically" obstructed or not obstructed standpoint.

FIGURE 1

TABLE 1	Group 1(n=50)	Group 2 (n=50)	
	Qmax (ml/s)		Qmax (ml/s)
FF	14.60±7.27	FF	13.54±6.35
5Fr	12.73±6.22	6Fr	11.26±5.44
8Fr	10.54±5.58	8Fr	9.65±5.21
P value: Over all	0.007	P value: Over all	0.003
FF vs 5 Fr/FF vs 8 Fr/5 Fr vs 8 Fr	<0.0001/<0.0001/0.0001	FF vs 6 Fr/ FF vs 8 Fr/6 Fr vs 8 Fr	<0.0001/<0.0001/<0.0001

FF= free uroflowmetry

FIGURE 2

TABLE 2		BOOI<40	BOOI>40	P value	BCI<150	BCI>150	P Value
Group 1	5Fr	25	25	1.0	32	18	0.81
	8Fr	25	25		31	19	
Group 2	6Fr	32	18	0.41	41	9	0.61
	8Fr	28	22		39	11	

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Institutional **Ethics Committee**, VMMC & Safdarjung Hospital, New Delhi, India **Helsinki** Yes **Informed Consent** Yes

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COMPARISON OF THE TECHNICAL QUALITY OF URODYNAMIC GRAPHS ACQUIRED VIA GOOGLE SEARCH ENGINE ON THE INTERNET WITH GRAPHS ACQUIRED VIA PUBMED.

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HYPOTHESIS / AIMS OF STUDY

Many (medical) students and residents and certainly also patients use the internet as a source of background information. A recent study reported the quality of health information regarding urolithiasis on the internet concluded however that a significant proportion of the information was biased.1 Urodynamic testing is done to objectively assess the dysfunction(s) that cause signs or symptoms of dysfunction, and requires physical measurements. Clinical measurements of (patho-) physiology comparable to urodynamics (e.g. lung-function, neurophysiology, cardio-physiology) are standardized and quality controlled. Urodynamics should be no exception with regard to standardisation and measurement quality. Urodynamic graphs are, apart from on internet sites, also published in the expert literature. We compared a sample of -peer reviewed- published urodynamic graphs with the technical quality of urodynamic graphs on the internet according to quality-items mentioned in the 'ICS Good Urodynamic practice 2016'.

STUDY DESIGN, MATERIALS AND METHODS

Google replies ≈600.000 results on 'urodynam*' and almost 1000 figures in the specific search option. Within the first 360 hits were 65 urodynamic graphs. PubMed replies >600 graphs when 'urodynam*' is searched in the (PubMed-) 'images' option. 36 within the first 400 figures were urodynamic graphs. Screenshots of these are saved march 11, 2018. Almost all these urodynamic graphs on internet are published before the publication of the ICS Good Urodynamic Practice 2016, in June 2017, although criteria for technical quality have been available in the earlier ICS urodynamic practice standard of 2002. Good urodynamic practice necessitates to control that initial –baseline- pressures are in the physiological range and that filling sensations and permission to void are indicated. Furthermore vesical and intraabdominal pressures should respond with equal amplitude (balanced) on abdominal pressure rises (coughing, talking, breathing, moving) and should measure an 'alive'-signal (breathing rhythm visible) throughout the test and furthermore: catheters should not slip out during the test.

RESULTS

11-14% of the graphs complied positive with all quality control items. Especially the frequent observation of baseline pressures outside the expected range, on the other hand, gives cause for concern as well as the number of graphs with pressures not or not adequately responding to abdominal (peak) pressure incidents. Sensation of bladder filling is relevant, both as a measure for bladder afferent abnormalities as well as a guidance to prevent overfilling, but is very frequently not visibly marked on the graphs. There was no difference between the graphs retrieved with Google or those obtained via PubMed.

INTERPRETATION OF RESULTS

Especially systematic zeroing to atmosphere seems not adhered to. Baseline pressures visible on the graphs are too low and or very uneven in almost 80% of shown cases/traces. When pressures are nevertheless responding in a balanced way (which has been the case in ≈65% of graphs) this should not have consequences for the pressure pattern of the cystometry. If pressures are used however, for leak-point pressure, detrusor (over) activity pressure, compliance or for pressure flow -analysis, the resulting detrusor pressures have become unreliable towards the known reference pressures. None of the legends provided with the graphs has included a comment on the quality of the graph. Regrettably, peer review has not demonstrably resulted in relatively more good quality urodynamic graphs. Urodynamic graphs available on the internet (sometimes specifically published with the goal to educate) and or graphs published in the peer reviewed medical literature are frequently not adhering to the ICS standard and therefore not suitable for (self-) education of urodynamic patterns. Many graphs do not help increasing the understanding of lower urinary tract physiology and also not the better understanding of lower urinary tract patho-physiology and dysfunctions, because of technical faults.

CONCLUDING MESSAGE

Many urodynamic graphs, both on internet as well as in scientific literature show imperfections when compared with good urodynamic practice criteria. Overall, only a minority of measurements that are (electronically) published were of good quality. The technical quality difference between peer reviewed and not peer reviewed urodynamics is negligible and the absence of explanation and discussion of visual (technical) features in the legends of the graphs hinders (self) education.

The table shows the percentages of graphs with the (good) quality features, mentioned here above present:

* both ≈80% when end of filling is interpreted as 'permission'
**during entire measurement.

FIGURE 1

	Total N	Baseline pressures	Filling sensations	Permission to void*	Balanced response	Alive signal**	Catheter slipped out	Overall good Q
PubMed	36	15%	25%	10%	62%	77%	5%	11%
Google	65	20%	22%	15%	66%	83%	6%	14%

REFERENCES

1. Chang DT, Abouassaly R, Lawrentschuk N. Quality of Health Information on the Internet for Urolithiasis on the Google Search Engine. Adv Urol. 2016;2016:8243095. doi: 10.1155/2016/ 8243095. Epub 2016 Dec 4. PubMed PMID: 28044076; PubMed Central PMCID: PMC5164884

2. Rosier PFWM, Schaefer W, Lose G, Goldman HB, Guralnick M, Eustice S, Dickinson T, Hashim H. International Continence Society Good Urodynamic Practices and Terms 2016: Urodynamics, uroflowmetry, cystometry, and pressure-flow study. Neurourol Urodyn. 2017 Jun;36(5):1243-1260. doi: 10.1002/nau.23124. Epub 2016 Dec 5. Review. PubMed PMID: 27917521.
3. Schäfer W, Abrams P, Liao L, Mattiasson A, Pesce F, Spangberg A, Sterling AM, Zinner NR, van Kerrebroeck P; International Continence Society. Good urodynamic practices: uroflowmetry, filling cystometry, and pressure-flow studies. Neurourol Urodyn. 2002;21(3):261-74. PubMed PMID: 11948720.

Funding Institutional **Clinical Trial** No **Subjects** None

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URINE FLOW RATE SHAPE TEMPLATE AND INTERMITTENT FLOW IN MALES

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HYPOTHESIS / AIMS OF STUDY

Uroflowmetry serves as a preliminary urodynamic test for physicians to indicate the possible cause of lower urinary tract symptoms. Alongside the most researched parameter maximum flow rate (Qmax), the shape of urine flow rate curve is also reported to associate with one or more voiding abnormalities [1]. Therefore, this novel study aims at by mathematically generating free-flow shape template in specified diagnostic groups, bladder outlet obstruction (BOO) and detrusor underactivity (DU), to assess its possibility for non-invasive diagnostic use.

STUDY DESIGN, MATERIALS AND METHODS

Free-flow data of 273 adult male patients who had also undergone PFS were analysed in this research. Based on their PFS record, these patients are divided into three groups: 104 BOO, 93 DU, and 76 normal (DU and BOO disease free) for reference. For each flow data, the starting and ending point has been selected by the threshold value of 0.5ml/s, then 2 seconds averaging window filter has been applied as suggested by ICS good urodynamic practice [2].

For the accuracy of the shape template, the intermittent flow data is not considered in template generating. ICS defines intermittent flow shape as flow stopping and starting during a single void [3]. However, an early or end dribble is normally included in the flow curve, as it is a part of voiding, the shape could therefore be classified as intermittent even the rest of flow is bell-shaped. We therefore detect intermittent flow on criteria of flow rate<0.5ml/s in the 0.5% to 98% volume void part, and generate flow shape template on non-intermittency data in the same area following the steps listed below:

1. Normalise flow curve into amplitude of 1 and samples of 1000, by dividing whole flow curve by Qmax and resampling of 1000 samples.

2. Calculate the mean values on each sample point in normalised flow curves in both diagnostic groups

3. Divide the whole generated data sequence by the maximum value in both diagnostic groups

Then the calculated data sequences are the shape template for BOO and DU. To assess the diagnostic usage of the template, all BOO and DU non-intermittent flow data in 0.5%-98% volume voided area are normalised and calculated the ratio of sum square errors (Res) on each re-sample point comparing with BOO template and comparing with DU template.

Intermittency detection and template generation were calculated in Matlab 2017a. Statistical analysis was performed in SPSS version 24, Mann-Whitney U test and T-student test were performed as appropriate. A statistically significant difference was considered as P value<0.05.

RESULTS

In total of 197 DU and BOO data, 75 data has been detected as intermittent, the rest 71 BOO and 51 DU non-intermittent data are employed for the template generating. The templates for each diagnostic group are presented as in figure 1.

Figure 1 BOO and DU flow shape template

The Res value is found having significant statistical difference between DU and BOO groups, with P=0.005. In receiver operating characteristic (ROC) analysis, area under curve (AUC) is 0.676 with 71% sensitivity and 63% specificity.

INTERPRETATION OF RESULTS

In this study, we found the flow shape template, generated by normalised flow curves, has a shape difference between two diagnostic groups. As presented in figure 1, the BOO template shows an asymmetric shape with maximum amplitude value appears in the first half and prolonged falling slope, while the DU template is almost a bell shape with maximum amplitude value located nearly at centre. The main differences between two templates are the maximum value location and the descending speed in falling slope.

The ICS definition on intermittency did not specify the starting and ending point to count stopping flow, and this could result in categorising flow curve with very small volume of starting or ending dibbles as an intermittent curve. In our study, we found it would be more accurate to only count in 0.5% to 98% volume voided area for intermittency detection.

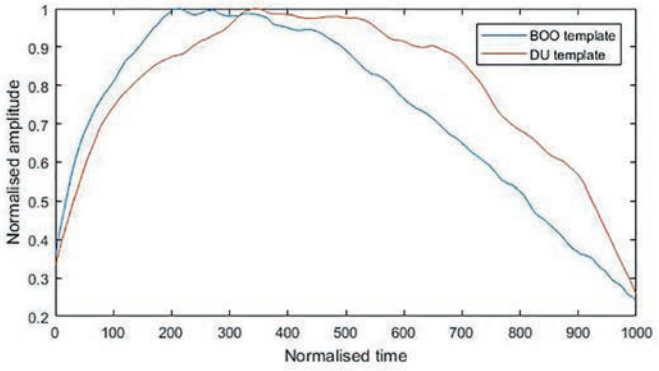
The parameter Res generated in our study could serve as an additional non-invasive indicator for differentiating non-intermittency DU and BOO flow in male. Although the diagnosing power could not be compared with simple Qmax<10m-

l/s for selecting male with BOO, the diagnosing accuracy for this new proposed parameter could be enhanced with other non-invasive indicators. It also shows the promise to explore the shape difference in other symptomatic groups, and its further application on diagnostic usage.

CONCLUDING MESSAGE

This study finds the shape difference between DU and BOO in males and proposes a novel non-invasive indicator for differentiating DU from BOO if the flow is non-intermittent. Further research will analyse the shape template difference in other diagnostic groups, and explore the possibility of non-invasively diagnosing DU by combining other non-invasive parameters.

FIGURE 1



REFERENCES

1. Abrams P, Cardozo L, Wagg A, Wein AJ. Incontinence: 6th International Consultation on Incontinence, Tokyo, September 2016. ICUD-ICS 2017.
2. Schäfer W, Abrams P, Liao L, Mattiasson A, Pesce F, Spangberg A, Sterling AM, Zinner NR, Kerrebroeck PV, International Continence Society. Good urodynamic practices: Uroflowmetry, filling cystometry, and pressure-flow studies. Neurourol Urodyn. 2002;21(3):261-274.
3. Gammie A, Yoshida S, Steup A, Kaper M, Dorrepaal C, Kos T, Abrams P. Flow time and voiding time – definitions and use in identifying detrusor underactivity. Neurourol Urodyn. 2016;35:s68.

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TECHNICAL PERFORMANCE OF THE 5 FRENCH T-DOC® AIR-CHARGED CATHETER FOR URODYNAMIC STUDIES

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HYPOTHESIS / AIMS OF STUDY

Urodynamics (UDS) is a branch of diagnostic studies devoted to the functional assessment of the lower urinary tract (LUT). Air charged catheters (ACC) are one type of assessment tool used in UDS to quantify pressures acting on the bladder, urethra and abdomen. For the first time, a 5Fr ACC is being developed for UDS studies. Up till now, ACC have only been available in a 7Fr size. A 5Fr catheter may be more suitable in size for some pediatric populations. ACC have less motion artifact than water catheters, important for pediatric patients who are often unable to remain still during UDS [1]. The aim of this study is to assess the potential clinical suitability of the new 5Fr ACC through five common UDS characteristics: pressure linearity, pressure offset, frequency response, pressure drift, and infusion rate [2].

STUDY DESIGN, MATERIALS AND METHODS

For this study, 184 total T-DOC® 5Fr ACC were used in four tests to characterize the observed parameters. For the first test (n=118), pressure offset and linearity data was obtained by inserting each catheter's pressure sensing balloon into a custom pressurized chamber, and catheter pressure read by a transducer (Digiquartz® Model 745, Paroscientific Inc, Redmond, WA). The balloon was charged according to the manufacturer's instructions, and influenced by step pressure changes in the chamber. Offset was calculated by taking the difference between applied pressure and pressure detected by the transducer. Regression analysis was performed to determine the linearity of the detected catheter pressure over increasing chamber pressure. Data for the second test (n=40), frequency response, was collected by placing a charged ACC sensor balloon inside a water column. The column was rigidly fixed to a pressure pulse generator (PPG601A, Flometrics, Carlsbad, CA) that introduced sinusoidal pressure waves with a sweep function of frequencies from 1 to 30Hz. A 50% amplitude attenuation (-6db) frequency was used to identify the functional bandwidth of the catheter frequencies [1]. The third test (n=5), pressure drift, used a custom pressure chamber held at 50 cmH2O, inside a water bath at 37°C, for 2 hours with catheter pressures recorded at t=0, 1 and 2 hours. The fourth test (n=15), infusion rate, was a simulated bladder infusion (Nexam Pro with 5-roller pump, MMS, Enschede, NL), that used a calibrated scale for post-infusion comparison. Each tested rate was infused for 5 minutes to attain a time-averaged infusion volume, except at 5mL/min which was infused for 20 minutes as per acceptability guidelines for low-infusion rates [2]. Each parameter is reported as mean ± standard deviation. Using a two-tailed z-test at a 95% confidence interval, the available data for frequency response and pressure offset were found to have adequate sample sizes. The infusion rate accuracy and pressure drift tests were

part of a pilot study and significant conclusions cannot be made about these data sets at this point.

RESULTS

The 5Fr ACC showed linearity of 0.99 ± 0.01, between 136 to 272cmH20, with a r^2 value of 1.00. The offset was shown to be -0.18 ± 1.09%, -1.03 ± 0.83%, -1.65 ± 0.65% at pressures of 136, 204 and 272cmH2O respectively. The catheters demonstrated an increased offset value, but decreased variability, as the catheters reached the maximums of their test range. The frequency response test demonstrated an immediate amplitude decay. The initial output voltage signal was attenuated by 50% at 7.13 ± 0.88Hz. The pressure drift test showed a slow pressure decay over a two-hour period with a reduction in measured pressure of 0.48 ± 1.08% at 1hr and –0.36 ± 1.46% at 2 hr. The infusion rates of 20-70mL/min produced offsets between 0.43% and 1.54% in total volume while at 5mL/min yielded on average -0.14mL/min offset [2]. The mean test results are illustrated in figure 1 with graphs A-D corresponding to tests 1-4 respectively.

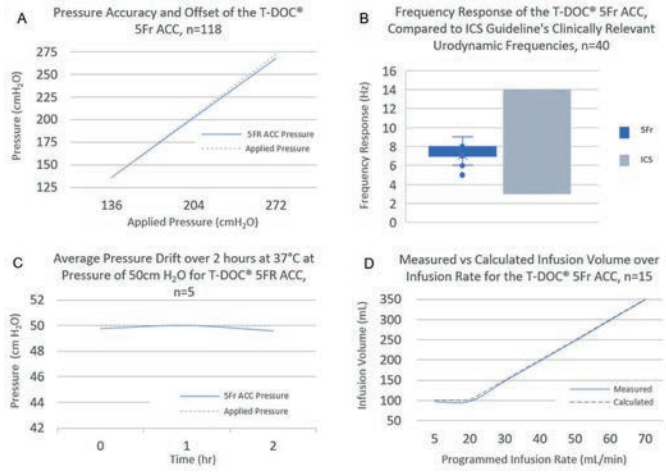
INTERPRETATION OF RESULTS

A linearity of 0.99 suggests that the pressure read from this catheter very closely follows the applied pressure, but was usually slightly lower than the actual applied pressure. The ICS guidelines for urodynamic equipment suggests that the sum of all pressure offsets should not affect pressure accuracy by more than 3% [2]. Most UDS studies do not run longer than one hour, and UDS pressures seldom hold at or above 200 cmH2O. Using the root sum of squares method, the combined pressure drift and linear offset of this catheter, stated after one hour at a pressure of 203 cmH2O is -1.18%. While the pressure drift test was a pilot study and more data is needed to draw a conclusion, the results obtained indicate acceptable total pressure offset. A frequency response of 7.13Hz adequately captures most events in a UDS study [1]. Previous studies on commercially available ACC deemed to capture adequate clinical data, reported frequencies of 3 and 5 Hz [1][3]. The infusion rates from this study indicate acceptable infusion from 5mL/min to 70mL/min, which should fulfill the needs of most UDS studies [2].

CONCLUDING MESSAGE

The data used in this study for pressure linearity, pressure offset and frequency response suggest that the T-DOC® 5Fr ACC will be suitable for use in UDS studies. More data is needed to draw significant conclusions about the pressure drift and infusion rate.

FIGURE 1



REFERENCES

1. Cooper M.A., Fletter P.C., Zaszczurynski P.J., Damaser M.S. Comparison of Air Charged and Water Filled Urodynamic Pressure Measurement Catheters. Neurol Urodyn. 2011; 30: 329-334.
2. Gammie, A., Clarkson, B., Constantinou, C., Damaser, M., Drinnan, M., Geleijnse, G., Griffiths, D., Rosier, P., Schäfer, W., Van Mastrigt, R., (The International Continence Society Urodynamic Equipment Working Group). International Continence Society Guidelines on Urodynamic Equipment Performance. Neurol Urodyn. 2014; 33: 370-379.
3. Couri BM, Bitzos S, Bhardwaj D, Lockhart E, Yue A, Goping I. Performance analysis of the T-DOC® air-charged catheters: An alternate technology for urodynamics. Neurol Urodyn. 2018; 37:619-625.

Funding This study was funded by Laborie Medical Technologies (LMT), owner of T-DOC® air-charged catheters. Tests were performed by LMT and Biomerics LLC. All authors work for LMT. **Clinical Trial** No **Subjects** None

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INCIDENCE AND PREDICTORS OF POSITIVE URINE CULTURE AND URINARY TRACT INFECTIONS AFTER URODYNAMICS. GETTING INTO THE ANTIBIOTIC PROPHYLAXIS DILEMMA.

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HYPOTHESIS / AIMS OF STUDY

Antibiotic treatment and prophylaxis before and after urodynamic studies (UDS) are controversial. We review the incidence of positive urine culture (UC) and urinary tract infections (UTI) after UDS and analyze predictors.

STUDY DESIGN, MATERIALS AND METHODS

A retrospective research on UDS was performed between March 2015 and January 2018 (490 patients). Patients who had at least 1 month follow-up were included for analysis (358). All patients had UC taken before UDS. UTI risk factors were assessed. Positive UC was defined as > 1000 CFU/ml. Asymptomatic bacteriuria (AB) was defined as a positive UC without UTI symptoms. UTI was defined as a positive urine culture plus UTI symptoms. Patients with negative UC did not receive antibiotic prophylaxis. Patients with AB received 3 takes of antibiotic prophylaxis before the study. We did not perform UDS on patients with UTI. UTI was registered up to 30 days after the UDS. Chi-square test, and logistic regression were used for analyzing predictors of positive UC and UTI after UDS.

RESULTS

Analysis included 358 patients. Mean patient age was 58 (18-92). The univariate analysis, showed that intermittent self-catheterization (54.5%), indwelling catheter (65.4%), recurrent UTI (55.8%) and AB before UDS (38.2%) were risk factors for developing positive UC after UDS ($p<0.0001$). Neither sex nor diabetes were predictors of positive UC or UTI after UDS.

In the multivariate analysis, all predictive factors for positive UC after UDS such as ISC, indwelling catheter, recurrent UTI and AB remained significative with OR 4.3 (IC 95%: 2,1-8.9), 9.8 (IC 95%: 4-24), 4.2 (IC 95%: 2-8.8) and 1.9 (IC 95%: 1.1-3.6) respectively.

After UDS, only 14 patients (3.9%) with positive UC developed UTI symptoms. We did not find any significant predictors of UTI due to the low incidence of patients with symptoms. All infected patients received oral antibiotics and none required hospitalization.

INTERPRETATION OF RESULTS

Out of all variable studied, ISC, indwelling catheter, recurrent-UTI and AB before UDS were significant predictors of positive UC after UDS in both uni and multivariate analysis. UTI incidence after UDS was low (3,9%), and infections were indolent.

CONCLUDING MESSAGE

Antibiotic prophylaxis is not necessary in patients with negative UC before UDS but should be strongly considered if there is a risk factor present.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Did not require approval **Helsinki** Yes **Informed Consent** Yes

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FLOW RESISTIVE FORCES INDEX (QRF): A NOVEL APPROACH FOR IMPROVING THE DIAGNOSTIC ACCURACY OF UROFLOW TEST.

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HYPOTHESIS / AIMS OF STUDY

In an attempt to improve the diagnostic accuracy of uroflowmetry by utilizing all the available information contained in the uroflow curve (voided volume, flow time, Qmax, Qave, time to peak flow), we developed a mathematical formula incorporating these parameters, to calculate Flow Resistive Forces Index (QRF), a novel measure of urethral resistance and assessed its clinical applicability vs Qmax.

STUDY DESIGN, MATERIALS AND METHODS

Main idea was based on the concept that, in terms of hydrodynamics, voiding occurs when a resultant force produces the impulse required to change the momentum of a given volume of urine, triggering transition from the stationary to the flowing state. Central pillars of our theoretical model were, the impulse-momentum principle deriving from Newton's second law of motion which, when applied to liquids states that, the sum of forces acting on a flowing fluid volume relate to its acceleration by: Faverage= V x aaverage and, the temporal profile of uroflow curve, that is bell shaped comprised of an ascending and a descending limb depicting the time sequence of events over the course of micturition, marked by steeply increasing/accelerating flow to a maximum value (Qmax) that then, gradually reduces/decelerates until termination. The resultant, that is net or total force applied to a given volume of urine during voiding, is composed of individual forces acting in opposite directions as: 1) Expulsive Forces (promote voiding/accelerate urine flow) and 2) Resistive Forces (impede voiding/decelerate flow). We regarded Detrusor pressure as the main impulsive force reflecting the pump function of the bladder and assumed that forces resisting outflow can be represented and quantified by Urethral resistance factor, that is considered the most reasonable estimate of urethral resistance, is applicable to both genders and can be calculated by the equation: URA=[(1+4dQ2Pdet)1/2-1]/2dQ2 deriving Pdet=(2dQ2URA +1)2 -1/4dQ2 (d=3.8x10-4) .Thus, total Faverage : = Fexpulsive – Fresistive= average Detrusor Pressure (Pdet) – average Urethral Resistance (R).

The equation was developed in three consecutive steps. In 1&2, average acceleration was calculated by individually measuring flow acceleration and deceleration deriving Eq-1 (aave = Qmax(tft-2tpf)/2tft) and by applying the impulse-momentum and Pdet formulas to extract Eq-2 (aave= dQave2 Rave2/V) [Qmax=maximum flow rate, Qin=initial flow (onset of voiding)[≈0], t0=time of initiation of urination[≈0], tpf = time to peak flow, Qfin=final flow[termination of voiding ≈0], tft=flow time, d=3.8x10-4, Qave= average flow rate, Rave = average urethral resistance, V= voided volume]. In step3, combining Eqs 1&2 and solving for Rave, the

QRFindex equation which expresses the mean resistance to urine was formulated . Subsequently, we applied QRF to a cohort of 84 patients (61 males-23 females) complaining of voiding dysfunction symptoms, who underwent uroflow test followed by pressure-flow study and were classified according to Schafer LinPURR nomogram as unobstructed (LinPURR: 0-1) or obstructed (LinPURR: 2-6). Although LinPURR grading is basically applicable to men, we decided to employ it in females, since there is no consensus on how to properly determine bladder outflow obstruction in women. Statistical analysis was performed by using the SPSS-22® and MedCalc® statistical packages (p<0,05).

RESULTS

Overall, urodynamic obstruction was diagnosed in 43,5% of the patients: 50,8% males [1 in 2] and 25% [1 in 4] females (x2=4,67-p=0,03). On univariate analysis, QRF values were significantly higher in obstructed vs unobstructed patients while, bivariate linear correlations, binary logistic regression model & ROC curve analyses, showed that in both sexes (mostly in men), QRF was a strong independent predictor of bladder outflow obstruction, significantly differing from Qmax that was weakly associated to this condition. Optimal QRF cutoff points: >2,8 in men - > 3,4 in women.

INTERPRETATION OF RESULTS

In both sexes (predominantly in men), QRF index was a highly significant predictor of bladder outflow obstruction diagnosis (exhibited excellent diagnostic performance characteristics),significantly outperforming in discriminative accuracy Qmax, the currently most widely used urethral resistance estimator.

CONCLUDING MESSAGE

The proposed mathematical formula derives a novel index (QRF) that highly accurately predicts bladder outflow obstruction, significantly outperforming Qmax. Relatively small cohort size, single center origin, lack of control group and employment of Schafer nomogram in females, were potential limitations. As this index seems to markedly improve the diagnostic ability of uroflow testing, we anticipate that with further clinical evaluation and validation, it might become a valuable complement to urodynamics armamentarium.

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Naval Hospital Of Athens, Office of Education and Research **Helsinki** Yes **Informed Consent** No

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COMPARISON OF URINARY TRACT INFECTION INCIDENCES AFTER URODYNAMIC EXAMINATION WITH OR WITHOUT PRIOR ANTIBIOTHERAPY OF ASYMPTOMATIC BACTERIURIA

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HYPOTHESIS / AIMS OF STUDY

Prophylactic antibiotherapy before urodynamic examination (UDE) in case of asymptomatic bacteriuria remains controversial (1,2). In the context of the worldwide rise of bacterial resistance triggered by unnecessary antibiotherapies, it seems pivotal to avoid their use as much as possible. In this prospective study, we aimed at comparing the incidences of urinary tract infection (UTI) within one week after UDE between two groups of patients. In the first group (group A), the patients with asymptomatic bacteriuria one week before UDE were treated according to antibiogram prior UD. In the second group (group B), none of the patients were treated for asymptomatic bacteriuria.

STUDY DESIGN, MATERIALS AND METHODS

Inclusion criterium was a neuro-urology visit with UDE. Exclusion criteria were cancellation of the UDE (refusal of patient or ongoing UTI), or performance of Botox® injections on the same visit. In all patients, a catheterized urine sample was acquired just before urodynamic examination for bacterial culture. Patients were then contacted per phone call seven days after UDE and asked whether they had presented in the past week one of the following symptoms: turbid and foul smelling urine, discomfort or pain at kidney or bladder level while voiding, unusual urinary incontinence, fever, spasticity, autonomous hyperreflexia, fainting, lethargy or unwell being. Symptomatic patients were treated according to antibiogram of a new urine culture.

RESULTS

In total 156 patients were screened out of which 151 were included among which 46 belonged to group A and 105 to group B. Both groups were comparable in terms of gender, age, neurogenic bladder rate and voiding mode. Patients with asymptomatic bacteriuria on the day of UDE reached 22,0 % in group A and 29,5% in group B. After one week, 15 patients could not be reached per phone call (5 in group A and 10 in group B) and 3 patients presented with UTI symptoms, while no patient presented fever. Among them, 2 patients (one in each group) had a urine-culture proven UTI both with a non-neurogenic bladder. UTI incidences after UDE reached 2,44% and 1,05% in groups A and B respectively.

INTERPRETATION OF RESULTS
Although the prevalence of asymptomatic bacteriuria was high among patients scheduled for UDE, UTI incidence after UDE was lower than 1,5% and no febrile UTI arose. Furthermore, prophylactic antibiotherapy in case of asymptomatic bacteriuria did not reduce UTI incidence after UDE.

CONCLUDING MESSAGE
According to our results, it seems safe to stop treating asymptomatic bacteriuria prior to UDE.

REFERENCES
1. Cameron et al. Neurourol Urodyn. 2017 Apr;36(4):915-926
2. Weglinksi et al. Med Mal Infect. 2016 Sep;46(6):300-7

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Chuv Lausanne **Helsinki** Yes

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PRE-OPERATIVE URODYNAMIC EVALUATION IN FEMALE MEDICARE PATIENTS UNDERGOING A STRESS URINARY INCONTINENCE PROCEDURE: RATES BEFORE AND AFTER THE VALUE TRIAL

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HYPOTHESIS / AIMS OF STUDY
Published in 2012, the ValUE Trial was a multi-center, randomized non-inferiority trial involving women with uncomplicated, demonstrable stress urinary incontinence to compare the outcomes after preoperative office evaluation and urodynamic tests or evaluation or only. This trial concluded that for women with uncomplicated, demonstrable stress urinary incontinence, preoperative office evaluation alone was not inferior to evaluation with urodynamic testing (UDS) for outcomes at 1 year [1]. Additionally, secondary analysis of the ValUE trial showed that 13-33 million dollars could be saved annually by not performing preoperative UDS [2].

The purpose of our investigation is to determine the trends and geographic patterns of pre-operative UDS testing in the United States for female Medicare beneficiaries with a diagnosis of stress urinary incontinence in 2011 and in 2013, before and after the publication of the ValUE trial.

STUDY DESIGN, MATERIALS AND METHODS
Using The Atlas Rate Generator exploring a 100% Medicare claims data, we identified females with a diagnosis of SUI by ICD-9 code (625.6) and a CPT code for either urethral bulking (51715) or urethral sling procedure (57288), within 306 hospital referral regions (HRR). We then identified the proportion of those who also had a CPT code for UDS within one year prior to their SUI procedure. See Figure 1 for the complete list of included CPT codes for UDS.

We collected data for 2011 and 2013, before and after the publication of the ValUE trial.

RESULTS
Complete 2011 and 2013 data was available for 151 of the 306 HHRs. Figure 2 displays the results for 2011 and 2013. The national percentage of pre-operative UDS evaluation was 53% (16020/30131) in 2011, compared to 55% (11,772/21579) in 2013, after the publication of the ValUE trial (p=0.157). In 2011, the highest percentage of UDS testing in was performed in Monroe, LA at 81% (48/59) and the lowest in Jonesboro, AR at 22% (14/64).

In 2013, following the publication of the ValUE trial, the highest percentage of UDS testing was performed in Longview, TX at 88% (43/49) and the lowest in Springfield, MO at 22% (22/99). Only 40% (61/151) of HHRs decreased their use of UDS, while 52% (79/151) increased UDS rates, and 8% (11/151) HHRs stayed the same.

INTERPRETATION OF RESULTS
There is significant regional variation in utilization of UDS in those undergoing a SUI procedure. Nationally, the overall rates of UDS, diagnostic testing did not increase or decrease significantly from 2011 to 2013. When evaluating at the HRR level, a larger proportion of HRRs demonstrated increased or unchanged rates after the publication of the ValUE trial results. Our results contrast those found in a prior smaller study of 387 patients at a single institution, where following the publication of the ValUE trial results, the percentage of patients undergoing pre-operative UDS testing dropped to 41% from 70% [3].

It should be noted that we were unable to differentiate between UDS testing and surgery performed by urologists versus urogynecologists. In addition, we were unable to account for which patients would be considered complex and thus warrant UDS prior to an incontinence procedure. However, we presumed there would be a similar proportion of patients considered complex in 2011 and 2013.

The strengths of our study include the fact that 100% of Medicare female beneficiaries were included. Limitations of our study include the fact that The Atlas Rate Generator is only able to provide information of Medicare claims data, thus our conclusion will be unable to generalize to younger patients. In addition, we would be unable to account for coding errors with the claims data.

CONCLUDING MESSAGE
Following the publication of the ValUE trial, there was no significant change in pre-operative UDS testing for Medicare beneficiaries prior to female incontinence procedure. Further research is needed to investigate the differences in pre-operative UDS testing after the publication of the of the AUA/SUFU SUI guidelines, as well the rates of UDS testing in populations other than Medicare beneficiaries.

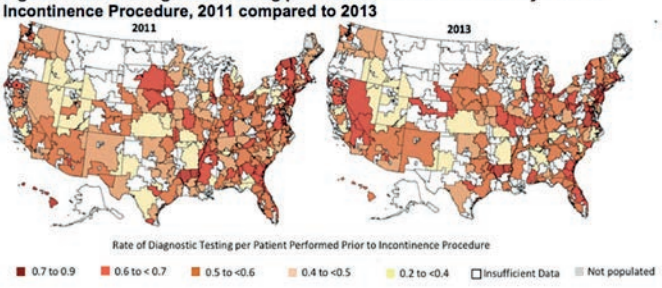
FIGURE 1

Table 1. CPT codes of Urodynamic Procedures Performed Prior to Stress Incontinence Procedure

UDS Procedure	CPT Codes
Urodynamics	51728, 51729
Complex cystometrogram	51726
Simple uroflometry	51736
Pressure-flow study	51797
Cystogram	51600
EMG	51784, 51785
Simple cystometrogram	51725
Cystography	74430

FIGURE 2

Figure 1. Rate of Diagnostic Testing per Female Medicare Beneficiary Prior to Incontinence Procedure, 2011 compared to 2013



REFERENCES

1. Nager CW, Brubaker L, Litman H. A Randomized Trial of Urodynamic Testing before Stress-Incontinence Surgery. N Engl J Med 2012; 366:1987-1997. DOI: 10.1056/NEJMoa1113595
2. Norton P, Nager CW, Brubaker L. The Cost of Preoperative Urodynamics: a secondar Analysis of the ValUE Trial. Neurourol Urodyn. 2016 January; 35(1):81-84. DOI:10.1002/nau.22684:
3. Llody JC, Dielubanza E, Goldman, HB. Trends in urodynamic testing prior to midurethral sling placement - What was the value of the VALUE trial? Neurourology and Urodynamics. 2017;1-7

Funding None **Clinical Trial** No **Subjects** None

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USE OF THE VBN MATHEMATICAL MODEL TO ACCOUNT FOR VOIDS IN WOMEN WITH HIGH FLOW RATE AND LOW DETRUSOR PRESSURE

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HYPOTHESIS / AIMS OF STUDY

Women sometimes void with high flow rate and low detrusor pressure (Qp) during urodynamic studies. A presumed mechanism is complete pelvic floor relaxation. However, during a normal void, forces possibly affecting the urethral flow include not only pelvic floor muscle relaxation but also urethral wall elasticity, sphincters tone, and possible abdominal straining. The flow governing zone is the location of the main sonic transition and may be deduced from pressure-flow studies (PFs) [1]. Our hypothesis was that the primary mechanism resulting in a Qp void was an increased urethral wall expansibility, with an amplitude inversely proportional to the density of urethral elastic fibers.

STUDY DESIGN, MATERIALS AND METHODS

From urodynamic recordings of 222 women investigated for various lower urinary tract symptoms and no obstruction, 27 women exhibited a high flow/low (Qp) voiding pattern during their PFs study. Of note, those urodynamic studies were carried out with a 7 Fr triple lumen catheter allowing for urethral pressure recording.

More expansible urethra was described in the VBN mathematical model of micturition [2] by multiplying the standard elasticity by a parameter called urethral resistance to dilatation (URD) whom value was lower than one in a Qp void.

RESULTS

In the 27 women, mean age was 66±11 years, range [42-88], predominant urinary complaint was stress urinary incontinence (9), mixed incontinence (9), frequency (5), urgency (2) and recurrent urinary tract infection (2). Urodynamic diagnoses were detrusor hyperactivity with impaired contractility (5), intrinsic sphincter deficiency (11), voiding with only relaxation of the urethra (9) and "normal" (2). Mean pdet.Qmax was 7.5±4.7 cm H2O with an associated high flow rate: Qmax = 27±6 mL/s. Bladder voiding efficiency (BVE) was > 90% and no abdominal straining was observed during the intubated flow.

Urodynamic diagnoses were detrusor hyperactivity with impaired contractility (5), intrinsic sphincter deficiency (11), voiding with only relaxation of the urethra (9) and "normal" (2). Introducing URD in the VBN computations allowed a good fitting with the recorded curves; figure shows computations with 2 values of URD for a Qp voiding. Mean value of URD for the 27 women was 0.36 ± 0.27.

INTERPRETATION OF RESULTS

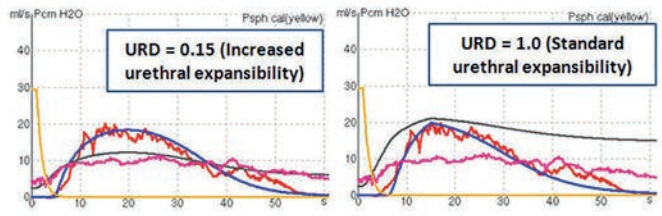
In the absence of obstruction, the sonic transition in women is located at the meatus (outside of the abdominal compartment) [3], so the driving pressure is the bladder pressure in addition to an altitude component, which is due to the difference in height between the bladder and the urethral meatus when the urethra is well-supported. That last component cannot be negligible in Qp voidings because the detrusor pressure is very low. If the sonic transition remains at the meatus, variations in flow are due to local changes in urethral wall elasticity. Modeling allows an explanation of this intriguing high flow/low pressure voiding phenomenon, which involves a marked change in the elasticity of the urethral wall. Future studies will focus on histological urethral wall changes to possibly confirm these modifications in urethral elasticity.

CONCLUDING MESSAGE

Mathematical modeling of micturition allows proposing an explanation of voidings with high flow rate and low detrusor pressure in women which would be an increased expansibility of urethral wall.

Legend of the figure: A good fitting between recorded and computed curves is only obtained with introduction of an increased urethral expansibility.

FIGURE 1



REFERENCES

1. Griffiths DJ. The mechanics of the urethra and of micturition. BJU 1973; 45: 497-507
2. Valentini FA, Besson GR, Nelson PP, Zimmern PE. Clinically relevant modelling of urodynamics function: The VBN model. NAU 2014; 33(3): 361-66. doi 10.1002/nau.22409
3. Besson G, Valentini FA Nelson PP. Progress in the theory of flow through the urethra during micturition. in ICS 26th Annual Meeting 1996; 39-43. G.Barbalias ed.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** It involved retrospective analysis of urodynamic studies from a database. **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "CONTINENCE CARE PRODUCTS / DEVICES / TECHNOLOGIES"

DEVELOPMENT AND EVALUATION OF A CONTINENCE PRODUCT DECISION AID FOR PRODUCT USERS AND CLINICIANS

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HYPOTHESIS / AIMS OF STUDY

For people with intractable incontinence, products to contain leakage are fundamental to health-related quality-of-life, but many users and healthcare professionals are unaware of the options. Despite the potential harm associated with poorly managed leakage (e.g. social isolation, carer workload and skin-damage), little evidence-based guidance on choosing products exists (1,2). Therefore, the aim of this study was to develop and evaluate a continence product decision aid (CPDA) to support product users and clinicians to make continence product decisions.

STUDY DESIGN, MATERIALS AND METHODS

Informed by international patient decision aid development guidance (3), work was undertaken in 4 phases.

I. Evidence and expert opinion: Literature review and consultation with specialist continence clinicians to establish the evidence base.

II. Prototype: Draft CPDA developed with iterative feedback from continence specialists (n=7).

III. Alpha testing: CPDA materials and a feedback questionnaire were provided to product users (n=10) with incontinence experience and specialist and non-specialist clinicians (n=11) to assess usability and acceptability.

IV. Beta testing: Field testing with men (n=50) post-radical prostatectomy to evaluate usability and acceptability. Men received usual care, with (n=34) or without (n=16) the CPDA. Participants completed the Decision Conflict Scale (range of 0-100; scores lower than 25 are associated with confident decision-making and scores of 37.5 or higher are associated with decision delay or implementation delay) and a bespoke feedback questionnaire.

RESULTS

An algorithm differentiating patients by sex, mobility, carer dependency, cognition and type/level of leakage, leading to 24 user groups was developed. For each group, a booklet containing a 'traffic-light' option grid and product information sheets guides appropriate product choice (Figure 1). All but one of the users and all clinicians interviewed stated that the CPDA provides a useful guide for product choice. The men who bought products and received the CPDA reported more confidence in their knowledge, clearer values, and felt more supported and less uncertain than men who did not receive the CPDA (Figure 2). In particular, men stated that they had greater confidence in their knowledge of product options available to them, the risks and benefits of those options and what is the best choice for their own circumstances. There was a difference in the percentage of participants reporting that they knew the risks or side effects of products if they received the CPDA (71%) compared to if they did not receive the CPDA (13 %).

INTERPRETATION OF RESULTS

The study highlighted the complexity of choosing the optimal continence management products caused by the combination of variation in incontinence, co-morbidities, daily activities and personal preferences. The CPDA was found to be usable, acceptable and to reduce product choice decision conflict with men post-radical prostatectomy.

CONCLUDING MESSAGE

The CPDA is the first comprehensive, theory and evidence-based intervention to help guide users and clinicians to combine the best available evidence with individual circumstances when making product choice decisions. Further evaluation is required with different groups to determine

impact on continence related quality-of-life and the CPDA is currently being modified for use by people with dementia. An online version has been is available at www.continence-productadvisor.org.

FIGURE 1

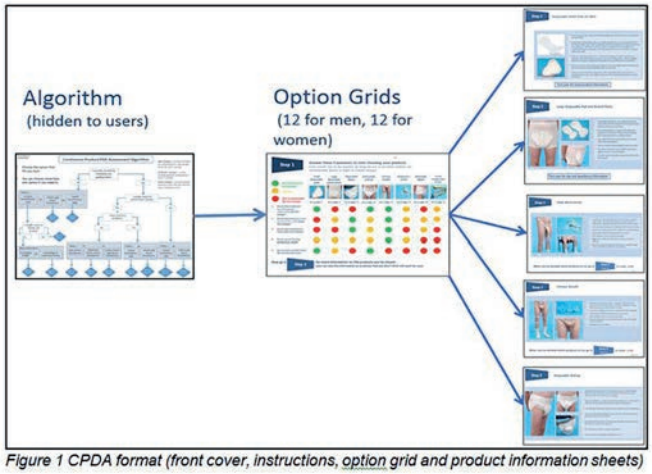

Figure 1 CPDA format (front cover, instructions, option grid and product information sheets)

FIGURE 2

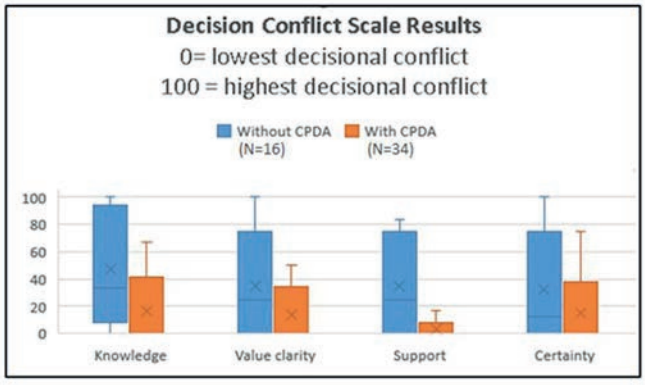

Figure 2 Decision Conflict Scale Results

REFERENCES

1. Drennan V, Cole L & Iliffe S (2011) A taboo within a stigma? A qualitative study of managing incontinence with people with dementia living at home. BMC Geriatrics 11: 75
2. Dingwell L & Mclaffety E (2006) Do nurses promote urinary continence in hospitalized older people?: An exploratory study. Journal of Clinical Nursing 15: 1276–1286
3. Elwyn G, O'Connor A, Stacey D et al (2006) Developing a quality criteria framework for patient decision UOS-211127aids: online international Delphi consensus process. BMJ 333:417

Funding This work was funded by the Movember Foundation in partnership with Prostate Cancer UK as part of True NTH programme **Clinical Trial** No **Subjects** Human **Ethics Committee** NHS South Central - Berkshire Research **Ethics Committee Helsinki** Yes **Informed Consent** Yes

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INTERMITTENT CATHETER CHOICE IMPACTS QUALITY OF LIFE: CLINICAL STUDY ON SAFETY AND PREFERENCE OF SINGLE VS. REUSE CATHETERS.

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HYPOTHESIS / AIMS OF STUDY

Intermittent catheterization (IC) is common bladder management for individuals with Spinal Cord Injury (SCI) and neurogenic lower urinary tract dysfunction (NLUTD). At present, there is an ongoing debate whether catheter reuse is as safe as single-use catheterization as there is a general lack of clinical evidence [1]. The aims of this study were to explore real life patient-related clinical data on safety and satisfaction of reuse vs. single-use catheters for IC in male and female patients.

STUDY DESIGN, MATERIALS AND METHODS

This was a prospective, multi-center, clinical trial conducted in the United States and in Australia. Sample size was set to 20 patients per country, considering comparisons of proportions between reuse vs. single-use catheters of approximately 60% vs. 10% (90% power, 5% 2-sided level of significance). The target population comprised people who currently practiced catheter reuse, and who agreed to prospectively evaluate single-use hydrophilic-coated (HC) catheters for 4 weeks. Participants reported outcomes which included the Intermittent Self-Catheterization Questionnaire (ISC-Q) to study patient satisfaction and health-related quality of life (HRQoL) [2]. Safety measures included bacteria contamination of reused catheters (detected by culturing and/or scanning electron microscope (SEM)) and patient-reported urological complications.

RESULTS

The study cohort consisted of 39 patients (Australia n = 18, United States n = 21). The mean age was 55 (SD = 13) years and the male/female distribution 69%/31%. All patients practiced IC due to non-neurogenic (n=13) or NLUTD (n=26). The majority (79%) had normal hand function and had practiced IC for a mean time of 10 years (SD = 9). All practiced self-catheterization with a mean of 6 times daily (SD = 2). Urethral sensitivity was normal in 31%, reduced in 38%, and lacking in 31%. At inclusion, all patients reused catheters for a mean of 21 days (SD = 48) per catheter. Reused catheter types were plastic (e.g. vinyl or PVC) 44%, red rubber (latex) 10%, and silicone 46%. Lubricants were used by 85%. Catheter cleaning was practiced by 92%; soap and water (44%) or running water (44%) were mainly used as cleaning methods.

A total of 36 patients completed the prospective test period and the mean ISC-Q score increased from 58.00 (SD = 22.57) to 67.19 (SD = 17.70) when patients switched to the single-use HC catheters (Figure 1). This corresponds to a statistically significant change of 9.42 (SD = 22.29) units (p = 0.0101) and a 20% increase in HRQoL. Higher scores were reported for the single-use HC catheters for all ISC-Q domains, i.e. better 'ease of use', 'convenience', 'discreetness', and 'psychological' were reported for single-use HC (Figure 2). Additional patient reported outcomes, specifying catheter satisfaction and comfort, also revealed significant differences in favor of single-use HC catheters when compared to reuse catheters. For example, fewer patients reported discomfort or pain with the single-use HC as compared to the reuse catheter (33% vs. 44%, p-value 0.0192). More patients reported that they were satisfied or very satisfied with the single-use HC as compared to the reuse catheter (83% vs, 54%, p-value = 0.0241). At the end of the study, 83% (95%CI [67%, 94%]) preferred to continue using single-use HC catheters.

All collected reused catheters (100%) were contaminated by debris (e.g. urine residuals). In 29 out of the 39 (74%) (95%CI [58%, 87%]) collected reused catheters, bacteria contamination was verified by either culturing or SEM. The most common detected species were Staphylococcus, Enterococcus, Pseudomonas, and Klebsiella. No bacteria contamination was detected in the single-use HC catheters (i.e. control group).

At the start of the study, 64% (n = 25) of the patients reported to have experienced urological complications in the last 12 months, mainly urinary tract infections (UTI). During the prospective test period, 75% (n = 27) were free from urological complications (p = 0.0007, Binomial test).

INTERPRETATION OF RESULTS

Results show a strong preference for IC with single-use HC catheters when compared to catheter reuse. Single-use HC catheters were also associated with a higher health-related QoL. Catheter reuse pose a potential patient safety issue as high levels of bacteria and debris contamination were detected on the collected reused catheters. Based on these results, clinicians should prescribe single-use IC and HC catheters should be the first and standard choice for catheter type.

CONCLUDING MESSAGE

Single-use HC catheters improved QoL and were preferred over catheter reuse among people practicing IC. Catheter reuse may pose a potential patient safety concern through biofilm colonization as well as reducing IC acceptance by people with NLUTD.

FIGURE 1

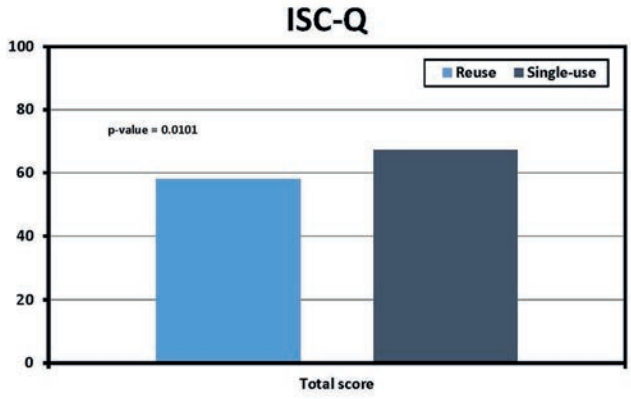

Figure 1: Mean ISC-Q total score.
NB. High score indicate greater satisfaction/quality of life within domain (Max = 100).
P-value from Wilcoxon signed rank test. 2-sided.

FIGURE 2

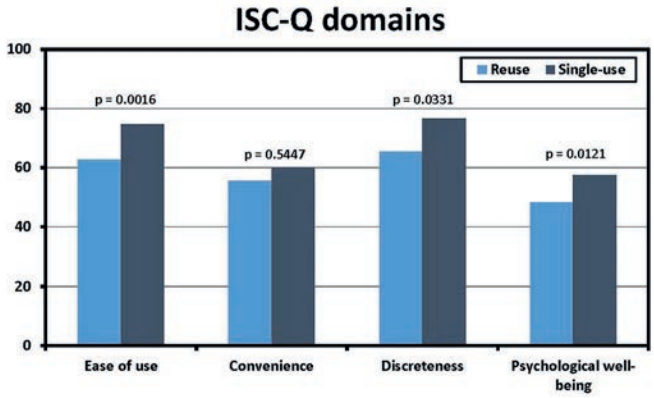

Figure 2. Mean ISC-Q domain scores
NB. High score indicate greater satisfaction/quality of life within domain (Max = 100).
P-values from Wilcoxon signed rank test. 2-sided.

REFERENCES

1. Christison K, Walter M, Wyndaele JJM, Kennelly M, Kessler TM, Noonan VK, Fallah N, Krassioukov AV. Intermittent catheterization: The devil is in the details. J Neurotrauma. 2017 Nov 6. doi: 10.1089/neu.2017.5413.
2. Pinder B, Lloyd AJ, Elwick H, Denys P, Marley J, Bonniaud V. Development and psychometric validation of the Intermittent Self-Catheterization Questionnaire. Clin Ther 2012;34(12):2302-2313

Funding The study was funded by Wellspect HealthCare, DENTSPLY IH AB (Sweden) **Clinical Trial** Yes **Registration Number** The clinical study is registered in clinicaltrial.gov with the identifier NCT02129738 **RCT** No **Subjects** Human **Ethics Committee** Approved by: University of Pennsylvania IRB (#820448), Medical College of Wisconsin/Froedtert Hospital IRB (PRO00022345) and Western IRB (PRO No 20140762), South Eastern Sydney Local Health District (HREC ref no 14/113), Metro South Hospital and Health Service (HREC/15/QPAH/819) and The Alfred Hospital **Ethics Committee** (271/14) **Helsinki** Yes **Informed Consent** Yes

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POST-ACUTE CARE URINARY DIARY: FEASIBILITY AND ACCEPTABILITY ASSESSMENT

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HYPOTHESIS / AIMS OF STUDY

The aim of this study was to test the feasibility and acceptance of a urinary diary to assist with bladder self-management (SM) for long-term urinary catheter users prior to discharge from post-acute care. The greater risk of urinary tract infection (UTI) associated with urinary catheterization has been well documented and individuals dependent on long-term urinary catheterization are at high risk for UTI's. Education and catheter training for this population is often initiated while in post-acute care. Because hospitalization time is often brief, it is important that patients develop strategies to prevent chronic complications such as UTI's prior to discharge. The use of a urinary diary has been reported as an effective intervention for individuals to reduce UTI's for persons within the community setting. These reported findings help to support diary use in the post-acute care setting.

STUDY DESIGN, MATERIALS AND METHODS

This descriptive feasibility study was conducted at a rehabilitation center. Subjects requiring long-term catheterization for bladder management were recruited from a post-acute care unit. Following informed consent, demographic and clinical data were collected via medical chart review and face to face interview. Subjects were then asked to complete a urinary diary and urinary journal for three consecutive days. Each participant received the urinary diary in two formats: paper and online. The urinary diary prompted the participants to document fluid intake, urine output, color of urine and to complete the urinary journal. Participants used the urinary journal to document more details about "what was noticed" and "what was going on or done about it". Staff and/or family caregivers could assist in diary completion. At the end of the 3 days, subjects completed a feasibility assessment and data were collected from the urinary diaries related to completeness. Demographic, clinical, and urinary diary data were analyzed using descriptive statistics. Differences between the paper format of the urinary diary and the online format were examined for amount of recorded data. Comment data from the feasibility assessment were analyzed using simple coding by the principal investigator and faculty advisor.

RESULTS

Six subjects completed the feasibility study. The sample included 3 men (50%) and 3 women (50%), mean age 43.7 years (range 23-66). Participants primary diagnoses were spinal cord injury (n=4), Multiple Sclerosis (n=1), and other (n=1). The spinal cord injured participants included cervical injuries (n=2) and thoracic injuries (n=2). Fifty percent of the participants (n=3) had no bladder sensation, one participant had partial sensation and two had full sensation. All participants plan of care for discharge included continued use of long-term urinary catheterization. Current bladder management methods included urethral urinary catheter (n=3), clean intermittent catheter (n=2) and a combination of clean intermittent and condom catheter (n=1).

Comparing the amount of data from the online and paper formats of the urinary diary, we found that all participants (n=6) had complete entries in the paper format while only one participant had complete entries in the online format for the three consecutive days. Missing data for the online format were noted to increase for diary day two and three. One participant did not access the online diary after completing orientation.

We found in the feasibility assessment that all participants agreed (n=3) or strongly agreed (n=3) that the urinary diary documentation was useful. Participants satisfaction with the urinary diary ranged from strongly agree (n=4), agree (n=1) and neutral (n=1). Fifty percent of the participants (n=3) were not able to enter any data online. Three participants reported to PI that they needed assistance from caregivers to enter data online and that caregivers were more likely to help with the urinary diary in the paper format. In the comments section participants reported that the paper format was "easily available," "easier to use" and "easier and faster" to complete. A common theme identified within the comments section was that all participants reported increased awareness related to: fluid intake and types of fluid (n=5); urine and urine output (n=3); increased caregiver awareness (n=2); adjusting fluid intake based on diary information (n=4). Two participants reported being diagnosed with a UTI after completing day one of the urinary diary, and these participants reported being more aware of their own urine and the changes that occurred with a UTI. Many of the participants identified that the nursing staff had monitored their fluid intake and urinary output but did not consistently share that information with them.

INTERPRETATION OF RESULTS

Comparing the use of the online urinary diary and paper urinary diary revealed that subjects completed the paper format diary more accurately with less missing data due to ease of use. Participants who were not able to independently document online were able to complete the paper format of the urinary diary with assistance from healthcare staff and family caregivers. All the participants reported a decrease or lack of involvement in monitoring their own fluid intake and urinary output before beginning the study. Importantly participants commented that they had increased communication with hospital staff related to fluid intake and urine output during the time of the study. This was particularly true for individuals with lower levels of independence and using a urethral catheter who needed help with the urinary diary documentation.

CONCLUDING MESSAGE

To our knowledge, this is the first study assessing the feasibility of a self-management intervention in the post-acute care setting for long-term urinary catheter users. This study supports post-acute care use of a urinary diary as a self-management strategy to increase patient awareness and active participation in their bladder management. The use of the urinary diary in the paper format was identified as the preferred method based on findings related to the amount of recorded data and participants' comments. Further research is needed to validate the use of a urinary diary during the patient transition time before and after discharging from post-acute care. It is possible that the use of a urinary diary may have a positive impact on patient knowledge, bladder management, and confidence leading to a conceivable decrease in complications.

Funding No funding **Clinical Trial** No **Subjects** Human **Ethics Committee** University of Nebraska Medical Center and Madonna Rehabilitation Hospital **Helsinki** Yes **Informed Consent** Yes

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PERCEPTION OF INTERMITTENT SELF-CATHETERIZATION BY UROLOGISTS: PRELIMINARY RESULTS OF A SURVEY AMONG THE FRENCH ASSOCIATION OF UROLOGY

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HYPOTHESIS / AIMS OF STUDY

Intermittent self catheterization (ISC) is the gold standard for the management of urinary retention. Patient's perspectives of ISC and adherence to this technique have already been reported in the literature. However, no data exists regarding the viewpoint of the professional caregivers including nurses and doctors.

The aim of the study was to explore the opinion of the urologist on self-catheterization and to evaluate the need for dedicated nurses specialized in ISC through a self-administered questionnaire.

STUDY DESIGN, MATERIALS AND METHODS

A questionnaire was designed by a panel of expert urologists and nurses to explore the opinion of the professional caregiver on self-catheterization and to evaluate the need for specialized education/or teaching of nurses in ISC. The questionnaire consisted in 52 multiple choice questions that assessed 6 dimensions: demographical data (6 questions), knowledge about ISC (15 questions), decisive factors to offer ISC to patients (11 questions), reasons for not offering ISC to patients (5 questions), ISC as a treatment option for themselves (3 questions) and professional experience with ISC (12 questions). Participants were asked to rate each item from 1 (no influence/strongly disagree) to 5 (major influence/strongly agree). A total score was calculated as the equal average of the ratings (RA, rating average) per question. The link to the questionnaire was sent to the members of the French Association of Urology (AFU) in 2018 and was made available online by using Surveymonkey website (https://www.surveymonkey.com).

The statistical analysis was carried out by using SPSS version 19.0. The results were presented in mean + 95% -confidence interval and percentages. The results were interpreted using the one-sample Student's t-test.

RESULTS

Demographical data

Questionnaires were sent to the 1607 available email addresses of urologists. The overall survey response rate was 12.8% (preliminary results). 50% (n=64) of urologist responders worked in a private hospital setting, 16% (n=20) in a public hospital, 26% (n=34) in a university hospital, 7% (n=9) in a mixed practice (other: 1%). When asked about their experience, 5.5% (n=7) were resident urologists, 28.1% (n=36) had less than 10 years of experience, 42.2% (n=54) had between 11-25 years of experience and 24.2% of the respondents had more than 25 years of experience. 61.7% (n=79) of the urologist responders offered ISC to 1 to 3 new patients each month and 5.5 % (n=7) never offered ISC to patients. Only 47.7% (n=61) of the urologists reported to have a permanent dedicated nurse in their team in order to teach ISC. 25% (n=32) of the participants reported to have a dedicated nurse to their disposal 'most of the time', and 14.8% (n=19) did not have a dedicated nurse.

Decisive factors to offer ISC to patients

Older age was an influencing factor (age between 55-75 had a rating average of 1.68 [0.67-2.7] and age >75 years old 2.94 [1.70-4.18]). Hand function (RA 4.24 [3.40-5.08]), tremor (RA 3.77 [2.87-4.66]), visual handicap (RA 3.35 [2.13-4.56]) and decreased mobility of the patient (RA 3.05 [1.81-4.28]) were rated as factors influencing the decision to propose ISC to a patient. Reduced mobility and impaired cognitive function were scored with a rating average of 3.04 [1.81-4.28] and 4.09 [3.06-5.12] respectively.

Decisive factors for not offering ISC to patients

36% (n=46) of the respondents thought that patients refused ISC (RA 2.23 [1.96-2.51]). The statement that ISC was repulsive and invasive was scored with a rating average of 3.19 [2.17-4.20] and 3.39 [2.43-4.34] respectively. The need for time and for explanation to convince patients to perform ISC was not perceived as an issue for respectively 64.8% and 63.7% of the respondents (2.28 [1.19-3.45] and RA 2.32 [1.19-3.44]).

Knowledge about ISC

75.8% (n=97) of the urologists considered their knowledge related to ISC to be sufficient, but 42.2% (n=54)reported that they would have offered ISC to more patients if they had had a better knowledge related to ISC.

Professional experience with iSC

When asked if urologists would be more eager to propose ISC to patients if they had a specialized nurse at their disposal, 33.0% of the study population fully agreed (RA 1.87 [1.08-2.66]). 14.9% of the participants thought that they would consider teaching self-catheterization to more patients if they had some kind of financial compensation (RA 2.03 [0.90-3.17]).

ISC as a treatment option for themselves

Only 32.8% of the respondents disagreed with the fact that ISC was considered 'invasive' (RA 2.53 [1-5]) (4.7% (n=6) fully disagree). 25.8% (n=33) of the questioned urologists did not find ISC repulsive (RA 1.99 [1-5]).

When asked what kind of catheterization they would have preferred for themselves, 97.7% would choose self-catheterization, and nobody would choose an indwelling catheter.

INTERPRETATION OF RESULTS

It is clear that age has to be considered when proposing ISC. The self-catheterization becomes less convenient with age due to co-morbidities (e.g. tremor, vision impairment) or loss of the skills needed to perform ISC. Performing ISC involves a number of key skills: organizational skills (preparation of materials), broad motor skills (when and how to sit and stand), fine motor skills (hand dexterity), and sensory input (perception and interpretation of sensory input). The survey shows that, in order of importance, impaired hand function, tremor and decreased vision are factors that influence the decision to propose ISC.

Factors such as mobility and central obesity may interfere with positioning for introducing the catheter into the urethra. Our results show that diminished mobility is perceived as less important than fine motor skills.

A major part of the urologists thinks that patients perceive ISC as invasive and repulsive but patients report the self-catheterization as easy, mostly painless, not interfering with their daily life activities and a serious improvement of their life quality.

Two out of ten urologists think that a financial compensation would give them more incentive to propose ISC to patients. More than half of the participants think they would offer ISC to more patients if they had a specialized nurse to their disposal.

It is clear from this survey that not only financial factors play a role, but also the presence of expertise and time for a qualitative ISC care. This indicates the need for training courses and dedicated nurses.

CONCLUDING MESSAGE

In order of importance, impaired hand function, tremor and decreased vision are factors that are of paramount importance in the decision to propose ISC to patients. Other factors include cognitive status of the patient, impaired mobility and older age. A surprisingly high number of urologists still think that patients perceive this procedure as invasive and repulsive, but this perception is not supported by literature. A financial compensation for ISC is desirable, but it is clear that not only financial factors play a role, but also the presence of expertise and time for qualitative ISC care. Herein lays a potential role for dedicated nurses.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Ghent University Ethical Committee **Helsinki** Yes **Informed Consent** No

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PREFERENCES FOR CONTINENCE CARE AT END OF LIFE: A QUALITATIVE STUDY

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HYPOTHESIS / AIMS OF STUDY

Functional dependence at the end of life often leaves individuals requiring help for personal care with bladder and bowel control. Urinary incontinence (UI), constipation and faecal incontinence (FI) are common at the end of life, occurring in up to 77% of older patients with cancer receiving palliative care [1]. Evidence suggests that the burden of incontinence for nursing home residents and those dying in their own home may surpass that of pain. A study of 213 cancer patients receiving palliative care were asked to rate their sense of dignity on a seven-point scale; those who indicated that 'loss of dignity was a significant concern', were statistically significantly more likely to have difficulty with bowel functioning and heightened dependence [2]. A review of textbooks and articles found a common sense approach to continence care at end of life, with little research-based evidence [3]. Generic end of life guidance states that symptom management should focus on minimising the impact of symptoms to maintain quality of life in accordance with the patient's values and preferences. While the importance of maintaining dignity at the end of life is clear, very little is known about patient preferences for continence care. This qualitative study sought to examine the continence care preferences of people receiving palliative care in order to understand what approaches to care and what care aims were important to them.

STUDY DESIGN, MATERIALS AND METHODS

This qualitative, exploratory study used individual semi-structured interviews. Adult participants were recruited using purposive sampling. Participants were patients in receipt of palliative care either in tertiary palliative care or hospice palliative care units. Participants had sufficient cognitive function to take part, as determined by their treating physicians and nurses' clinical judgement and by their ability to complete a 30 minute interview. All participants were in receipt of some care for either bladder or bowel continence or constipation. Informed consent for all interviews was gained. Interviews focused on continence care preferences of the participants and were conducted until saturation was reached. Interviews were recorded and transcribed verbatim. Following a conventional content analysis approach, two researchers coded the interviews independently, and then collaborated to develop the coding framework and identify categories and themes.

RESULTS

Seven men and seven women were interviewed (mean age, 73 years). Six participants were recruited from the tertiary palliative unit and eight were from the hospice palliative unit. Current bladder/bowel issues included: urinary incontinence (3), fecal incontinence (2), double incontinence (4), constipation (2), urinary retention (2), and urinary incontinence with constipation (1). Thirty-four codes were identified and subsequently collapsed into 7 categories and 3 themes. The three overarching themes were: "Losing control", "Finding a way to manage", and "Caregivers can help and can hinder". Themes, categories and exemplar quotes are in Table 1.

INTERPRETATION OF RESULTS

Loss of dignity was commonly reported but, in contrast to previous research, it was not perceived as greatly important at end of life compared to other issues participants faced. They did not want to surrender dignity and would try to preserve it in challenging situations. However, their illness was seen as "a journey," and dignity could be surrendered in order to address more important concerns such as managing pain and staying clean. Kindness and communication skills of healthcare providers as formal caregivers was important to preserving dignity and maintaining quality of life. Almost all participants had used pads, and although not ideal, many found them a suitable way to manage continence. Catheters were perceived to be an unacceptable option, but at times, this was seen as a convenient solution, which increased comfort. Participants had little recollection of alternative treatments being offered. They were rarely consulted about management preferences but when asked, felt their preferences were followed. Patients commonly trusted the healthcare professionals' opinions or did not want to think about the problem, accepting what was offered as a solution as long as it worked. What might be considered less than optimal management by health care professionals (e.g. containment rather than toileting) was accepted and sometimes the choice of participants. To ensure best patient care, healthcare professionals need to ask patients about what is most important to them and prioritize this.

CONCLUDING MESSAGE

Patients at end of life were willing to give up elements of dignity to achieve efficient continence care and remain clean. Other symptoms were prioritized by participants ahead of achieving continence. If containment strategies may alleviate or prevent patient distress, pain or discomfort, then it should be offered. Healthcare professionals should incorporate patient preferences as best they can when treating incontinence at end of life.

FIGURE 1

Themes	Categories and Exemplar Quotes
Losing control: This describes the participant's physiological feelings of reduced control over their bladder and bowels, as well as the loss of their overall state and quality of life.	**Losing control over bladder and bowel:** "I can't feel and I have no control to stop or start" (C1) **Discomfort, bother and pain:** "...keep it under control. To not wait too long to ask for something for pain because having to wait for it the pain gets a lot worse." (C12) **Challenges to Dignity:** "...you get kind of used to it [to] the loss of dignity because you do it out of necessity" (C8)
Finding a way to manage: In an attempt to reduce symptoms and improve quality of life at end of life participants tried a variety of interventions in search of the best and/or easiest one, but did not always understand what physicians and nurses were recommending.	**Management/interventions:** "...well [the catheter] has been a lifesaver really because the pain with trying to get off the bed was getting to the point where it just wasn't worth it any longer and I wasn't sure what to do." (C2) **Not knowing the options:** "With regard to the bowels when I took the option of taking the radiation treatment no one told me that in many cases the adjacent bowel areas will be affected." (C11) **Easiest way:** "I found these [pull-ups] quite quickly and I didn't really look for any other options." (C2)
Caregivers can help and can hinder: Those taking care of the participants were shown to have positive and negative effects on their care, not just physiologically, but socially and emotionally as well.	**Effects of caregivers:** "It is the way they go about telling me, that's probably the best; it's not just for you it's for everyone. It will keep your family up to speed, everybody gets it." (C10) "[She] brought it ...all the [other nurses] and they stood there and they actually laughed at me. I just thought that's not respectful, like you were never taught respect to be that way, our respect was to be respect, right?" (C10)

REFERENCES

1. Van Lancker A, Velghe A, Van Hecke A, et al. Prevalence of symptoms in older cancer patients receiving palliative care: a systematic review and meta-analysis. J Pain Symptom Manage. 2014;47(1):90-104.
2. Farrington N, Fader M, Richardson A. Managing urinary incontinence at the end of life: an examination of the evidence that informs practice. Int J Palliat Nurs. 2013;19(9):449-456.
3. Chochinov HM, Hack T, Hassard T, Kristjanson LJ, McClement S, Harlos M. Dignity in the terminally ill: a cross-sectional, cohort study. Lancet. 2002;360(9350):2026-2030.

Funding First Quality **Clinical Trial** No **Subjects** Human **Ethics Committee** University of Alberta Health Research Ethics Board **Helsinki** Yes **Informed Consent** Yes

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ACCURACY OF PAD COUNT IN THE ASSESSMENT OF URINARY INCONTINENCE SEVERITY: EVIDENCES FROM A LARGE-SCALE MULTICENTER PAD TEST STUDY

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HYPOTHESIS / AIMS OF STUDY

In order to treat patients with urinary incontinence (UI), a baseline and post-treatment comprehensive assessment is required including first of all an objective quantification of the degree of involuntary leakage [1]. The evaluation of the degree of UI is a key aspect of the UI management with containment products in order to personalize the choice of a well-fitted product as much as possible. We reported that after adapting the products prescription to the objectively measured leakage volume, the appropriateness of pads use was significantly improved [2]. Similarly, an accurate measure of UI severity is of utmost importance in order to choose the best pharmacological or surgical treatment and to compare the outcomes of different treatment strategies.

Pad test is recognized as a robust and reproducible tool for the measurement of the degree of UI [2]. On the other hands, the number of pads used per day is widely used as an estimation of UI severity and has shown to be a reliable measure of urine leakage volume in an ambulatory setting [3]. While pad tests are somewhat cumbersome and time-consuming, pad count recorded by the patients/carers for 24 hours or some days is definitely a more streamlined method.

The objective of this study was to determine in a very large population of community-dwelling incontinent patients, the accuracy of pad count as measure of the degree of incontinence, using data from a multicenter, large-scale, pad test study.

STUDY DESIGN, MATERIALS AND METHODS

The "Determining the Individual Appropriateness of Pads Provision and Enhancing its Realization" (DIAPPER) pad test study has been the largest published study evaluating the appropriateness of continence products prescription [2]. It has been an Industry-supported research performed in five continence services of Italy. In the present study, data obtained from the first cross-sectional part of the study were used for the analyses.

Briefly, patients suffering from UI and provided with absorbent products were included from 01/2012 to 03/2016. All patients or their caregivers have been invited to perform a 48-hour pad test in their usual home environment and to fill in a diary with detailed information on pad usage, including number of changes. Patients/cares not willing to participate, incomplete filled diary, and/or not adequately performed pad test were criteria for exclusion.

At visit 1, patients/carers were carefully instructed on how to perform the pad test. Patients had to complete the pad test performing usual daily activities, and using their usual pads and changing them as they would regularly. At visit 2, the diary were analysed by the continence professionals and the following data were recorded: number, design and size of used products, wearing time (WT) and net pad weight gain (PWG) of each product, total amount of urine lost in 48 hours (48PWG). Pads size was based on the absorption level they are intended for, defined as follows: up to 200 g/pad (light UI); from 200 to 350 g/pad (moderate UI); 350 to 500 g/pad (severe UI); >500 g/pad (very severe UI).

Descriptive statistics for each of the three measures of UI (PWG, 48PWG, 48-hour pad count) were computed. Pearson's correlation coefficients between all variables were calculated. To investigate patients' characteristics influencing pad count, univariate and multivariate logistic regression analyses were conducted using LOGIT and GLM model. Included variables have been age, gender, body weight, waist circumference, health district of residence, type of main activity during the study days (walking, sitting, lying), level of autonomy (autonomous or assisted) and mobility (ambulatory, partially ambulatory, bedridden), skin health status (healthy, inflamed, ulcerated), use of diuretics (yes, no), number, design (rectangular, shaped, brief, pull-on, bed pad) and size of used products, mean wearing time (WT) and mean PWG, 48PWG. Differences were considered to be significant when $P < 0.05$.

RESULTS

Out of 19,675 screened patients, 14,493 patients/cares (94.2%) completed correctly the pad test and were included in the final analysis, using overall during the study days 98,362 continence products. Males and females represented the 26% and 74%, respectively, of the total population. Mean age was 78±15 years (79±14 for males, 74±19 for females).

Mean 48-hour pad count was 6.8 (±2.7, range 1-12) and mean PWG and 48PWG were 290 g (±243, range 1-2144) and 1966 g (±1569, range 5-16,250), respectively. Male patients showed higher 48PWG and PWG, but lower 48-hour pad count compared with females ($p<0.0001$ for all comparisons).

The Scatterplot of 48-hour pad count versus 48PWG is shown in Figure 1. 48-hour pad count showed only a weak positive correlation with 48PWG. The linear correlations for the whole population showed an R2 value of 0.12. The correlations for males and females showed an R2 value of 0.18 and 0.11, respectively. A weak negative correlation (-0.16; $p<0.01$) was observed between PWG and 48-hour pad count. Very week correlations were found between the different UI measures and age.

Higher correlations between 48PWG and 48-hour pad count were found among patients using <6 pads/48-hour (R2 = 0.14) compared with those using >6 pads/48-hour (R2 =

0.02; p<0.01), although correlation coefficients remained low in both range groups.

At multivariate logistic regression analyses, an independent association between pad count and both 48PWG and PWG was observed, although the relationships were not linear. A statistically significant negative association between pad size and pad count was observed, with patients using products for severe and very severe UI showing a 45% and 39% lower propensity to use more pads than those using products for light UI (p<0.0001), respectively. With regard to product design, patients using shaped and rectangular products had 34% and 40% higher propensity to use more pads than those using briefs (p<0.0001), respectively.

Lower level of activity gave a higher propensity to use more pads, and the health district of residence as well was a weak but independent predictor of pad count.

INTERPRETATION OF RESULTS

There was a very weak correlation between the pad count and the degree of UI as measured with pad test. Pad count only accounted for 13% of the variability of UI volume (18% and 11% in males and females, respectively).

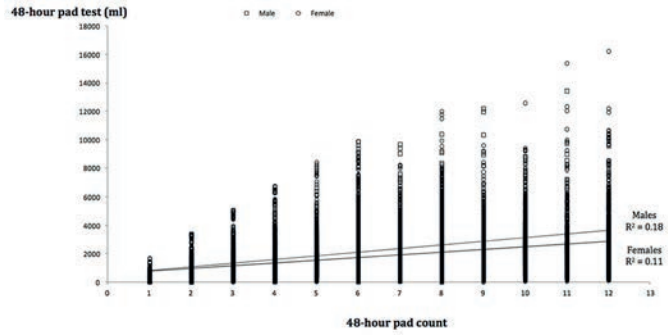
The relationship between pad count and pad weight was not linear and the higher the pad count, the lower the correlation. Thus a stepwise increase of the 48PWG was observed particularly in the range of 48-hour pad count from one to six with the highest correlation coefficient observed for male patients using <6 pads/48-hour (R2 = 0.20). Consequently, pad count appears still more unhelpful in distinguishing patients using a number of pads higher than six.

The complexity of the relationship between pad count and pad weight is further demonstrated by the impact that variables other than leakage volumes had on the propensity (odds) to use more pads.

CONCLUDING MESSAGE

This study confirmed on a very large observational base that pad count is a poor measure of the degree of UI having a very modest correlation with the real leakage volume as objectively measured by the pad weighing test. Pad count only measured 13% of the variance of UI volume. Consequently, pad count should not be used instead of the pad test as an objective measure of UI severity when an accurate evaluation is required for research or clinical purposes.

FIGURE 1



REFERENCES

1. Castro-Diaz, Robinson D, et al. Initial assessment of urinary incontinence in adult male and female patients. In: Abrams P, Cardozo L, Wagg A, Wein A. (eds) Incontinence 6th International Consultation on Incontinence, Tokyo, ICUD-ICS 2016
2. Sacco E, Bientinesi R, Gandi C, Palermo G, Pierconti F, Bassi P. Objectively improving appropriateness of absorbent products provision to patients with urinary incontinence: The DIAPPER study. Neurourol Urodyn. 2018 Jan;37(1):485-495
3. Groutz A, Blaivas JG, Chaikin DC, Resnick NM, Engleman K, Anzalone D, Bryzineski B, Wein AJ. Noninvasive outcome measures of urinary incontinence and lower urinary tract symptoms: A multicenter study of micturition diary and pad tests. J Urol 2000; 164: 698–701

Funding This study was supported by Fater S.p.A., manufacturer of the continence products. Sacco E. received consultancy fees from Fater S.p.A. **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Study based on standard of care procedures. **Helsinki** Yes **Informed Consent** Yes

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CONTAINMENT PRODUCTS AND QUALITY OF LIFE IN MEN WITH LIGHT TO MODERATE URINARY INCONTINENCE: AN EXPLORATORY ANALYSIS.

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HYPOTHESIS / AIMS OF STUDY

Urinary incontinence (UI) is a common disorder with a substantial impact on quality of life (QoL). UI is a truly debilitating from a physical, psychological and social point of view and may cause both isolation and loss of independence. UI affects up to 11% of men aged 60–64 years and 30% of men ≥85 years [1]. Should treatment not result in symptom control, then containment of incontinence with continence products is an option. Whereas the wearing of continence pads in women with bladder problems is common and perhaps more accepted, that in men is less so [2]. Whilst it may be assumed that use of pads is an effective means to achieve

social continence, there is little evidence as to the extent pad use affects quality of life. This study aimed to investigate the effect on quality of life of pad use in men with mild to moderate urinary incontinence in order to assess the feasibility of conducting a fully powered trial.

STUDY DESIGN, MATERIALS AND METHODS

This was a quasi-experimental prospective cohort pilot study in community dwelling adult men (≥18years) who had not previously used containment products. Recruitment efforts and field notes were tracked to gain an understanding of feasibility of a future planned study. Burden of questionnaire assessments was assessed. Informed, written consent to participate was gained from each man prior to any study procedure. Each man completed a baseline series of symptom and quality of life questionnaires, then provided with a supply of continence pads (2 pads/ day) for 6 weeks. After six weeks, the quality of life measures were repeated.

Measures included at baseline and 6 weeks , International Consultation on Incontinence Lower Urinary Tract Symptoms Quality of Life questionnaire (ICIQ-LUTSQoL), EuroQoL -5Dimension generic quality of life measure (EQ-5D), International Consultation on Incontinence Male Lower Urinary Tract Symptoms Short Form questionnaire (ICIQ- MLUTS-SF), International Prostate Symptom Score (IPSS), Sandvik index, at baseline, duration of incontinence and demographics were collected.

The change in primary outcome measure, ICIQ-LUTSQoL and secondary outcome, EQ-5D total visual analogue score between baseline and end of study was used to calculate an effect size from which a power calculation was performed (G-power). This will inform a fully powered trial.

As there were no data upon which to power this exploratory study, the mean change and variance in ICIQ- LUTSQoL from a trial of treatment in women was used as a proxy, resulting in a desired sample size of 23 [3]. Analysis was by Student's t test for matched pairs

Men were not offered any incentive to participate. Travel expenses related to study visits, and a free supply of containment products were provided.

RESULTS

Recruitment: Recruitment efforts were varied, including internet and local radio advertisements, talks to local community men's health groups, Prostate Cancer support groups, posters and washroom door notices around the city, main hospital outpatients and university campus, identification of potential participants at urology and continence clinics. No route was more successful than another. Over 6 months, 46 men were screened and 17 recruited to the study. Reasons for screen failure included varying previous pad use and requests for payment to participate. Three men dropped out prior to completion, 1 due to travel, and 2 due to pad incompatibility. The mean (SD) age of the included men was 69.1 (14.8) years (range 33 - 89 years). The distribution of the duration of incontinence prior to inclusion was: ≤ 1 year; n=3, 1-2 years; n=2, 2-5 years; n=2, > 5 years; n=7. The questionnaires appeared feasible, taking an average of 20 minutes per participant to complete. Baseline Sandvik index indicated moderate severity and total IPSS was 15.1. Table 1 shows the baseline and end of study outcome indicators. Of all ICIQ-LUTSQoL subdomains, only "overall interference" (n/10) showed a statistically significant shift over the course of the study (mean (SD) 5.6 (3.3) baseline v 4.4 (3.2) end of study, p=0.028)

Using the change in total ICIQ-LUTSQoL and total EQ-5D VAS to calculate an effect size gives an effect size of 0.1 and 0.33 respectively. The required sample size for a fully powered study with power of 0.8 and alpha of 0.05 is n= 740 using total ICIQ- LUTSQoL and n=76 using total EQ-5D VAS.

INTERPRETATION OF RESULTS

Recruitment proved difficult and labour intensive with a high screen failure. Men were reluctant to come forward and the study failed to reach its intended sample size, although a robust estimate of variance on the primary endpoints was probably achieved. Participants tended to have a long duration of incontinence. The questionnaires were not perceived as burdensome upon the recruited men who mostly had moderate degrees of incontinence. An effect size using total VAS in EQ-5D appears feasible to conduct a fully powered study. ICIQ-LUTSQoL hardly changed in response to pad usage suggesting either an insensitivity to change with a containment intervention in men, or a failure to measure the things that mattered to men. A qualitative study of men's use of pads, currently lacking in the literature, is planned to further explore this area.

CONCLUDING MESSAGE

The ICIQ- LUTS QoL questionnaire is insensitive to change in an exploratory study of the effect of pad use on the quality of life of men naïve to pad use. A trial using a generic QoL scale such as EQ-5D appears feasible. Recruitment is difficult and requires multiple avenues to achieve.

FIGURE 1

	Baseline	6 Weeks	p
	mean (SD)		
EQ-5D VAS Score	68.5(22.0)	74.9 (16.9)	0.23
EQ-5D Index Score	0.822 (0.1)	0.817 (0.1)	0.840
ICI LUTS QoL Total Score	34.9 (8.9)	34.2 (9.5)	0.73
Sandvik Severity Index	6.3 (2.5)	4.6 (2.4)	
ICI-MLUTS-LF (n=10)	22.3 (4.1)	22.9 (5.1)	
I-PSS	15.1 (6.9)	15.6 (7.6)	

Table 1: Results

REFERENCES
1. J Urol, 2006. 176(5): p. 2103-8; discussion 2108.
2. Int J Clin Pract, 2009. 63(6): p. 869-73.
3. Neurourol Urodyn. 2015;34(8):747-751.

Funding Capital Health Chair in Healthy Ageing **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** University of Alberta Health Research Ethics Board **Helsinki** Yes **Informed Consent** Yes

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SEXUAL FUNCTION IN WOMEN WITH MULTIPLE SCLEROSIS, WHO RECEIVE TREATMENT WITH CLEAN INTERMITTENT SELF-CATHETERIZATIONS. PRELIMINARY RESULTS.

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HYPOTHESIS / AIMS OF STUDY
Women with Multiple Sclerosis (MS) are usually found to have a lack of libido and sometimes even an absolute abhorrence for sex. It is, also, common that their lower urinary tract symptoms (LUTS) may be correlated with this situation. The aim of our study is to determine if treatment with clean intermittent self-catheterizations (CIC) could improve their sexual functionality.

STUDY DESIGN, MATERIALS AND METHODS
In our observational study, sexually active women with MS have been observed. Their medical history included severe LUTS with the filling of incomplete voiding, urgency, frequency and incontinence. Patients without post-void residual (PVR) and no sexual function have been excluded. Also, women with PVR> 150ml have been advised and decided to start CIC, 4-6 per day, with or without anticholinergics. In the first visit, all patients underwent a kidney-bladder ultrasound, an uroflow and a baseline urodynamic test. Additionally, they were all asked to complete the Female Sexual Function Index (FSFI) and Hamilton Depression and Anxiety questionnaires. In the second visit, three months later and under CIC, women were re-evaluated with ultrasound, FSFI and Hamilton's tests. The following statistical analysis has been based on SPSS v21.

RESULTS
An amount of 51 sexually active women with MS have been observed and 34 of them, aged 24-45 (mean= 31.5), have been finally enrolled. The rest 17 were excluded as they had PVR< 150ml (70.6%), they referred no sexual dysfunction (23.5%) or they rejected CIC treatment (5.9%). In the first visit, FSFI domains have been calculated separately. The mean desire score was 2 (range 1-3), while mean arousal scored at 2.65 (range 0-4). Lubrication domain have been found at a mean of 2.97 (range 1-4) and mean pain was 3.23 (range (1-4). The mean orgasm score was 1.5 (range 0-4) and the mean satisfaction score was 2 (range (0-4). Mean total FSFI was 15.5 (range 0-23). The Hamilton Depression test scored at a mean of 19.5 (range 14-22) and Hamilton Anxiety test calculated with a mean of 34.5 (range 21-56). Especially on question 12 of Anxiety test, referring to the urogenital disorders, the mean score was 3 (range 2-4). In the second visit the same scores have been performed. Hence, mean desire score was 3.5 (range 2-5), mean arousal score 4 (range 2-5), mean lubrication score was 3 (range 1-4), mean pain score was 3 (range 1-4), mean orgasm score was 2.5 (range 2-5) and mean satisfaction score was 3.5 (range 2-5). The statistical difference was found significant in desire, arousal, orgasm and satisfaction domains ($p= 0.02$, $p= 0.01$, $p= 0.03$, $p= 0.01$ respectively). Lubrication and pain domains were not significantly affected ($p> 0.05$). The mean of total FSFI in the second visit was 19.5 (range 10-28) with a statistically significant improvement compared to the first visit ($p= 0.03$). The Hamilton Depression test scored at a mean of 18.5 (range 14-20) and Hamilton Anxiety test at a mean of 31 (range 19-48). No statistical difference has been found compared to the first visit scores ($p> 0.05$). Nevertheless, question 12 of Hamilton Anxiety test scored at a mean of 1 (range 0-2), statistically improved after the first visit ($p= 0.02$).

INTERPRETATION OF RESULTS
There is a statistically significant improvement of sexual life in women with MS, treated with CIC, according to FSFI scores.

CONCLUDING MESSAGE
Treatment with CIC in sexually active women with MS could improve their sexual activity, maybe relieving them from severe LUTS. Their psychological status seems to be mainly unaffected. Observation of more cases could give more evidence in these preliminary results.

Funding No funding **Clinical Trial** No **Subjects** Human **Ethics Committee** Scientific Council of General Hospital of Larisssa **Helsinki** Yes **Informed Consent** Yes

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DUTCH TRANSLATION AND VALIDATION OF 4 QUESTIONNAIRES IN ORDER TO EVALUATE INTERMITTENT SELF CATHETERIZATION IN PATIENTS WITH NEUROGENIC BLADDER: INCASAQ (INTERMITTENT CATHETERIZATION SATISFACTION QUESTIONNAIRE), ICAT (INTERMITTENT CATHETERIZATION ACCEPTANCE TEST), ICSQ (INTERMITTENT SELF CATHETERIZATION QUESTIONNAIRE) AND ICDQ (INTERMITTENT CATHETERIZATION DIFFICULTY QUESTIONNAIRE)

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HYPOTHESIS / AIMS OF STUDY

Intermittent self catheterization is by far the most appealing therapy in order to achieve a complete bladder emptying when a patient present some post void residual, or urinary retention due to neurological disease.

Indeed, it's a self-administered procedure which not only improves quality of life, but also decreases morbidity and mortality related to neurogenic bladder.

There is a need for tools in order to assess patient's satisfaction, difficulties and acceptance of this technique.

4 questionnaires available in French have been developed in order to assess these issues.

The aim of this study was to translate, culturally adapt, and validate a Dutch version of the Intermittent Catheterization Satisfaction Questionnaire (InCaSaQ), Intermittent Catheterization Acceptance Test (ICAT), Intermittent Self Catheterization Questionnaire (ICSQ) and Intermittent Catheterization Difficulty Questionnaire (ICDQ).

STUDY DESIGN, MATERIALS AND METHODS

(1) Translation and cross cultural adaptation of the InCaSaQ, ICAT, ICSQ and ICDQ was performed according to the standardized guidelines.

(2) The test of the pre-final version was performed by a group of bilingual lay people by comparing the original version of the questionnaires and the back translated one, assessing the comparability of language and comparability of interpretation (reference 1). (3) Problematic issues were reviewed for correction.

(4) Reliability examined by intraclass correlation coefficients (ICC) statistics and Cronbach alpha analysis.

RESULTS

Pre-test by 45 raters who are fluent in the source language lead to an adapted and improved version of the translated questionnaires.

Fifty native Dutch speaking patients performing ISC for more than 6 months due to a neurogenic bladder were prospectively included.

InCaSaQ, ICAT, ICSQ and ICDQ showed good internal consistency (α respectively 0.86, 0.864, 0.857 and 0.896) and reproductibility (Intraclass correlation coefficients respectively 0.78, 0.77, 0.81 and 0.89).

INTERPRETATION OF RESULTS

InCaSaQ, ICAT, ICSQ and ICDQ were translated and culturally adapted for the use in Dutch patients performing ISC because of a neurogenic bladder. This validation study showed good measurement properties of the Dutch version of the questionnaires.

CONCLUDING MESSAGE

The translated questionnaires are reliable and valid, allowing self-reported assessment of satisfaction, acceptance, difficulties and QoL reated to ISC in Dutch patients with neurogenic bladder.

REFERENCES

1. Sperber AD. Translation and validation of study instruments for cross-cultural research. Gastroenterology. 2004;126(1):S124-S128.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Ghent Hospital ethical committee **Helsinki** Yes **Informed Consent** Yes

207 www.ics.org/2018/abstract/207

RELATED FACTORS OF INCONTINENCE AND CONTINENCE MANAGEMENT STRATEGIES AMONG THE ELDERLY OF LONG-TERM CARE FACILITIES IN TAIWAN

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HYPOTHESIS / AIMS OF STUDY

Urinary incontinence (UI) is one of the most common and distressing conditions affecting nursing home residents and their caregivers and staff. It has an adverse impact on physical health, psychosocial status, and the costs of health care. Some clinical trials have suggested proper toileting assistance could promote continence. Unfortunately, no survey to date was done to investigate prevalence and relative

risk factors of incontinence and continence management strategies in Taiwan. It is not clear if residents receive proper assistance in toileting and selection of diapers are not clear. The aim of this study was to investigate the prevalence and continence care strategies among elderly population living in the long-term care institution.

STUDY DESIGN, MATERIALS AND METHODS
A cross-sectional survey was done and 810 subjects were recruited from long-term care institutions in Eastern Taiwan, Stratified cluster sampling to ensure representativeness of the target population. Incontinence status and continence care strategies were investigated by trained research assistants. Clinical data were derived from a retrospective clinic medical record review and checklists including mobility, incontinence status, and continence care products use, toileting assistance, and daily fluid intakes were used to recorded the current continence care status.

RESULTS
Average age of the sample was 81.46yrs, 52.9% were female, average lengths of stay in the institution were 3 years, numbers of comorbidity 3.82, and average number of daily medication 11.48 tablets. Prevalence of urinary incontinence(UI) was 40%, and 7.8% for fecal incontinence and 29% with double incontinence. Elderly needed wheelchair assistance was up to 63.6%. Total dependence which classified by Barthel index less than 40 was up to 384 (47.4%), average CDR Clinical Dementia Rating is 2.65, 243 people had severe cognitive disabilities (30.4%) by measurement of MMSE Mini-Mental State Examination .

The odd ratio between UI and related disease are stated as follow: chronic diseases as pressure sores was 10.11 (p=.03), brain vascular disease was 4.18 (p=.00), urinary infection 8.19 (p=. 00), dementia 5.74 (p=. 00). The odd ratio between UI and lower extremity activity were analyzed and the results revealed that unable to stand or hip lifting had significantly higher risks of wearing diapers, (OR 29.86, p <.0001) . In addition, unable to stand but able to lift hip for 30 seconds still obtain a higher risk on diaper use(OR 6.77, p <.001). The odd ratio between UI and degree of cognitive impairment by MMSE found that severe, moderate and mild cognitive impairment was 8.94, 3.35, and 2.94 respectively.

In related to diaper use, 639 (78.9%) of the total participants wore diaper , and use of adhesive-tape diaper is 475 (74.3%). For the people using diapers, 99 (12.2%)of them could ambulate independently without assistance but still wearing diapers. And 247(51.5%)of the subjects who wear adhesive-tape diaper were able to stand for 30 seconds.

INTERPRETATION OF RESULTS
The results of this study discover that urinary tract infections, pressure sores, dementia and muscle strength for standing and hip lifting were risk factors in developing incontinence. Effective assessment of the related risk factors can slow down the occurrence of incontinence.

CONCLUDING MESSAGE
This study suggested that long term care institutions should implement an incontinence assessment system for early detection of high risk groups to improve the quality of the institutionalized elderly population by early intervention and treatment, by keeping daily physical activities, body functions and reduction of diaper use.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Tzu Chi Hospital Research **Ethics Committee Helsinki** Yes **Informed Consent** Yes

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A NOVEL MOBILE ACOUSTIC UROFLOWMETRY: COMPARISON OF UROFLOWMETRY AND MOBILE ACOUSTIC UROFLOWMETRY

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HYPOTHESIS / AIMS OF STUDY
Uroflowmetry is a screening urodynamic test in urology. Standard conventional uroflowmetry is inconvenient for patients because the measurement environment is unfamiliar and unnatural, demanding a timed voiding for the test. A novel acoustic uroflowmetry is based on sound analysis using a smart phone, and can be used at home without cumbersome settings. The aim of this study is to evaluate the accuracy of this method comparing the new acoustic uroflowmetry to a standard uroflowmetry.

STUDY DESIGN, MATERIALS AND METHODS
A novel mobile acoustic uroflowmetry is an easy-to-use, non-invasive method to estimate the urine flow simply by recording the sound during voiding with a smart phone. After the approval of institutional review board, patients with voiding complaints were recruited and the voiding sound was recorded during standard uroflowmetry measurements. Male subjects were recorded in standing position and females in sitting position. The urine flow rate is calculated as the voiding sound was recorded and processed. Voided volume can be obtained by integrating the calculated flow rate. Cases with voided volume <20mL or having recording problems were excluded. Pearson's correlation coefficient (PCC, r) was used to compare the maximal flow rate (Qmax), average flow rate (Qavg), and voided volume estimated by the standard uroflowmetry with those calculated via acoustic uroflowmetry.

RESULTS

A total of 97 patients including 60 males and 37 females were analyzed. Mean age was 59.8, 59.9 years for men and women respectively. Urination sounds differently by gender, perhaps due to differences in their anatomy of pelvis/lower urinary tract and posture during urination. Therefore, the data was analyzed separately for men and women. Flow patterns recorded by acoustic uroflowmetry and conventional uroflowmetry showed a good visual correlation (Fig 1). For male patients, average Qmax, Qavg and voided volume were 15.4mL/s, 8.4mL/s and 198mL, respectively. An excellent correlation was observed between the two methods for Qmax (r=0.88), Qavg (r=0.91) and voided volume (r=0.95). For female patients, average Qmax, Qavg and voided volume were 18.5mL/s, 9.7mL/s and 204mL, respectively. Qavg (r=0.93) and voided volume (r=0.96) showed excellent correlation, while Qmax showed good correlation (r=0.78) between the two methods in females.

Figure 1. Examples of flow pattern recorded by the standard uroflowmetry (line) and acoustic uroflowmetry (dots) using voiding sound record after processing.

INTERPRETATION OF RESULTS

In 2015, Krhut et al. have reported a sound-based uroflowmetry, named 'sono-uroflowmetry (SUF)' [1]. This study was consisting 25 healthy male volunteers and demonstrated strong correlation for the duration (r=0.87). However, moderate correlation was observed in voided volume (r=0.68), and Qavg (r=0.57). For Qmax, poor correlation (r=0.38) was observed. Another study from the same team with 36 healthy female volunteers showed strong correlation for duration (r=0.95) but moderate correlation for voided volume (r=0.68) and poor correlation for the Qmax (r=0.38) [2].

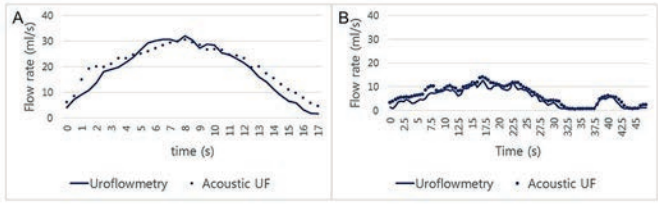
While SUF focused on the basic relationship between sound intensity to instant flow rate in time domain, our prediction method analyzes various sound features and its combination in spectral domain. Additional algorithms were applied to suppress sound artifacts, offset environmental characteristics, and improve its prediction accuracy. Our results showed strong correlation between the result of standard uroflowmetry and estimated parameters by the acoustic sound based uroflowmetry. Qmax, Qavg and voided volume showed a strong correlation both in men and women who are with wide range of severity and various voiding patterns.

This easy to use mobile acoustic uroflowmetry can be used to check and monitor the urinary flow rate and volume both in patients and healthy people in daily, natural settings. It can also offer longitudinal trends of key urodynamic parameters in a quantitative manner, so would be helpful for not only patients and caregivers, but also for healthcare providers and payers who need to pre-screen and monitor lower urinary tract symptoms. The smartphone app has a uses an automatic voiding diary for daily usage. Time to void and voided volume can be calculated and filled by predicted urine flow from recording each voiding event, and automatically consolidated for each day. This quantitative and ease-of-use app might improve shortcomings of current voiding diary such as incomplete voiding diaries with missing values and low compliance. Limitations include that males voiding in sitting position are not included for the analysis. The concept and baseline technology can also be applied for pediatric applications, but more investigation and validation will be necessary.

CONCLUDING MESSAGE

This study shows that an acoustic uroflowmetry is possible with a good correlation with the standard uroflowmetry. Further works on prediction accuracy and error with different toilet settings is needed for broader use.

FIGURE 1



REFERENCES

1. Krhut, J., et al., Comparison between uroflowmetry and sonouroflowmetry in recording of urinary flow in healthy men. Int J Urol, 2015. 22(8): p. 761-5.
2. Gartner, M., et al., Evaluation of Voiding Parameters in Healthy Women Using Sound Analysis. Low Urin Tract Symptoms, 2018. 10(1): p. 12-16.

Funding Funding - This work was supported by grant No S2534278 from the Ministry of SMEs and Start-Ups Research Fund. **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Ethics approval and consent to participate - Seoul National University Bundang Hospital Insti-tutional Review Board (IRB) approved this study. IRB approval number is B-1709-423-301. **Helsinki** Yes **Informed Consent** Yes

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ULTRASOUND EVALUATION OF THE INFLUENCE OF CUBE PESSARIES ON FEMALE'S PELVIC FLOOR

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HYPOTHESIS / AIMS OF STUDY

In some clinics daily used cube pessaries are offered to the women with pelvic organ prolapse (POP) as first line treatment, in most of the centers - as second or third line. Some specialists advocate that cube pessary can activate pelvic floor muscles (1). It was not investigated if avulsion of puborectalis muscle can have negative influence on effec-

tive cube pessary insertion. Palpation and ultrasound was used to investigate pelvic floor in many aspects (2, 3).

In our opinion optimal for pelvic floor evaluation is placing the transducer externally. In many studies 2D and 4D abdominal probes were used for transperineal examinations, in some - introital transvaginal pelvic floor ultrasound was used. There are no study comparing those methods.

We hypothesized that cube pessary could reduce hiatal dimensions at rest. We hoped that cube pessary would improve Kegel's exercises, and during Valsalva maneuver would have protective effect on pelvic floor through minimizing enlargement of the hiatal dimensions. We expected that puborectalis total avulsion could minimize positive influence on pelvic floor in comparison to women without total avulsion.

The aim of the study was to evaluate during ultrasound examination the influence of cube pessary on female's pelvic floor at rest and if cube pessary will change the effectiveness of Kegel's exercises or Valsalva maneuver. The additional aim was to find out if puborectalis avulsion will correct the influence of cube pessary on pelvic floor.

STUDY DESIGN, MATERIALS AND METHODS

Between 1st April 2016 and 28th February 2018 247 female patients entered urogynecologic center to treat symptomatic POP. 10 were excluded (unsuccessful fitting, incomplete results). This is a retrospective study of data obtained from 237 women, 25- 85 years old (average - 61). All patients had a standardized not validated interview, a clinical assessment using the ICS POP-Q, along with a 2D introital pelvic floor ultrasound (transvaginal probe - PFS-TV) (2) and 2D/4D transperineal ultrasound (abdominal probe - PFU-TA) (3) using GE Kretz Voluson 730 Pro. Bladder neck mobility was evaluated during maximal Kegel's and on maximal Valsalva lasted min. 5 sec in PFS-TV and PFU-TA - value HI (longitudinal axis) and value DI (transverse axis), (Fig. 1), (2, 3). Hiatal dimensions (area - AH, circumference CH, longitudinal diameter LH) were measured in the plane of minimal hiatal dimension (PFU-TA). Longitudinal distance between symphysis pubis and puborectalis muscle was measured in 2D mode (PFU-TA) – SL. Levator trauma was identified by tomographic ultrasound (TUI in PFU-TA) (3).

One experienced specialist using set of pessaries, fitted perforated cube pessaries with button and knot from number 0 to 5 (Dr Arabin, Germany, Fig. 2). The goal of the therapy was that the patient herself will insert a pessary in the morning and take it out in the evening.

Another specialist was experienced in pelvic floor ultrasound, both PFU-TA and PFS-TV.

RESULTS

All patients had symptoms of POP, 30.8% - stress urinary incontinence, 39.2% - overactive bladder, 16.5% - voiding difficulty.

On examination a cystocele stage 2+ was found in 86.9%, significant central compartment prolapse in 54.9%, and a rectocele stage 2+ - in 43%. In 89% we detected any form of prolapse of stage 2 or higher.

Mean vaginal parity was 2.0 (range, 0- 5), and 81% were vaginally parous. A vacuum or Forceps was reported by 2.1%, a hysterectomy by 8%. BMI was 27 (range, 18-53).

The percentage of fitted cube pessaries was as follows: size 0 - 6.3%, 1 – 20.0%, 2 – 33.0%, 3 - 26.7%, 4 - 10.4%, 5 - 3.6%. POP-Q stage had no influence on fitted cube pessary size. There were statistically significant differences on hiatal dimensions between patients with different cube pessary size (0-5) – bigger for bigger pessary (in cm2 AH: 20.75, 20.54, 23.67, 27.38, 30.49, 33.87, in cm CH: 17.11, 17.04, 18.32, 19.69, 20.65, 21.85, in cm LH: 6.25, 6.29, 6.73, 7.22, 7.56, 8.05).

After inserting cube pessary at rest D value (PFU-TA and PFS-TV) was smaller than before insertion (1.68cm vs. 2.1cm, $p<0.0004$ and 1.04cm vs. 1.38cm, $p<0.0004$). The rest measurements were not different.

The differences in HI (PFU-TA and PFS-TV), SL, AH, CH and LH during Kegel's exercises performed without pessary and with pessary inserted were not statistically significant. DI in PFS-TV in patients with cube pessary had lower value (0.30cm vs. 0.46, $p<0.007$), but in PFU-TA differences were not statistically significant (0.15cm vs. 0.27, $p<0.12$).

During Valsalva maneuver the following diameters were smaller in women with cube pessary inserted comparing to pessary taken out: value HI PFS-TV (0.8cm vs. 1.45cm, $p<0.000000$), value HI PFU-TA (0.92cm vs. 1.61cm, $p<0.000000$), AH (-3.9cm2 vs. -6.62cm2, $p<0.000000$), CH (-1.21cm vs. -2.12cm, $p<0.000000$), LH (-0.38cm vs. -0.6cm, $p<0.000014$), SL (-0.15cm vs. -0,25cm, $p<0.016$). The difference in DI value in PFS-TV was statistically significant (-0.29cm vs. -0.44, $p<0.04$), while in PFU-TA did not reach statistical significance (-0.17cm vs. -0.28, $p<0.08$)

During Kegel's exercises a higher degree of hiatus decreasing size was observed in women without total puborectalis avulsion in comparison to patients with avulsion: LH (1.03cm vs. 0.72cm, $p<0.00052$), AH (4.66cm vs. 3.22cm, $p<0.000588$), CH (2,18cm vs. 1,43cm, $p<0.0006$).

During Valsalva maneuver differences were not statistically significant, however in patients without total puborectalis avulsion hiatal dimensions were smaller.

There were no statistically significant differences in value HI (PFU-TA and PFS-TV) between patients with and without avulsion during Kegel's exercises and Valsalva maneuver.

INTERPRETATION OF RESULTS

We confirmed that POP-Q stage had no influence on chosen cube pessary size. Hiatal dimensions (AH, CH, LH) correlated with cube pessary size which was successfully fitted.

At rest, inserted cube pessary moved bladder neck to symphysis pubis - lower DI values after pessary insertion in comparison to measurements without pessary. The rest measurements including hiatal dimensions did not change after pessary insertion.

We did not find statistically significant influence of cube pessary insertion on efficiency of Kegel's exercises. The difference in DI value measured at rest and Kegel's during PFS-TV was smaller in women with cube pessary inserted. In women with pessary at rest, bladder neck was closer to the symphysis pubis and this could be the reason for this difference.

During Valsalva maneuver, cube pessary showed protective effect on pelvic floor through statistically significant lower hiatal dimensions and bladder neck mobility in comparison to measurements without inserted cube pessary.

Women with pessary inserted without total puborectalis avulsion performed Kegel's exercises more efficiently than women with avulsion. We did not find statistically significant differences in protective effect of cube pessary between patients with total avulsion and without avulsion.

There were no statistically significant differences between patients with and without avulsion in bladder neck mobility during Kegel's exercises and Valsalva maneuver.

CONCLUDING MESSAGE

Fitted cube pessary sizes depended on hiatal dimensions. POP-Q stages had no influence on cube pessary size.

At rest inserted cube pessary moved bladder neck to symphysis pubis.

Cube pessary insertion did not have influence on pelvic floor during Kegel's exercises, but could have protective effect during Valsalva maneuver.

Cube pessary improved effectiveness of Kegel's exercises better in women without total puborectalis avulsion in comparison to patients with avulsion. Cube pessary had similar protective effect on pelvic floor in women with and without avulsion during Valsalva maneuver.

Fig. 1. PFS-TV - evaluation of bladder neck position: HI and DI (S-symphysis)

Fig. 2. Perforated cube pessary

FIGURE 1

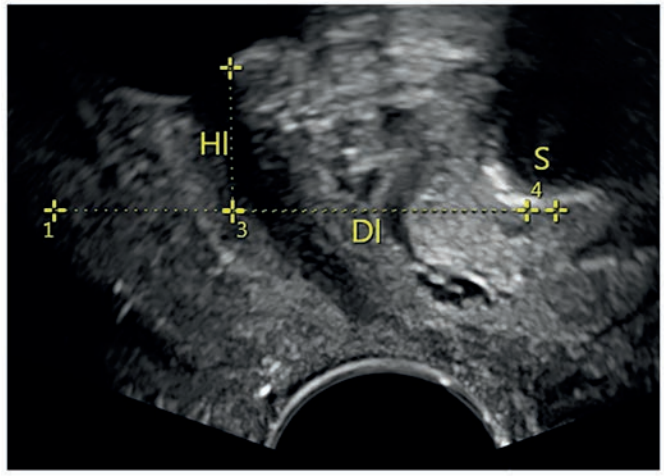
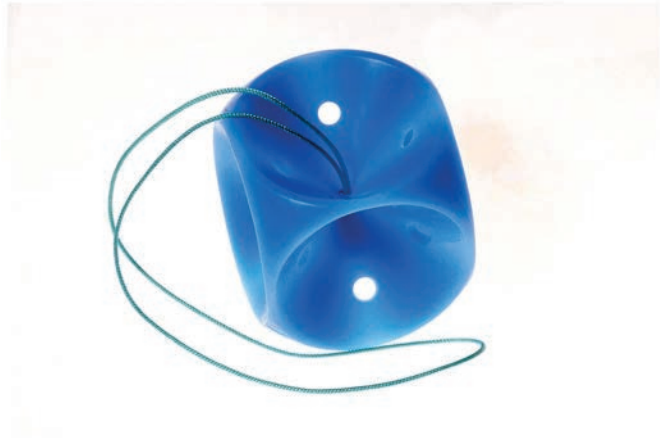


FIGURE 2



REFERENCES

1. Int Urogynecol J (2013) 24:1695–1701
2. Neurourol Urodyn (2015) 34:741-6
3. Ultrasound Obstet Gynecol (2016) 48:681-692

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THE PREVALENCE OF HYPOVITAMINOSIS D IN WOMEN WITH URINARY SYMPTOMS.

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HYPOTHESIS / AIMS OF STUDY

Urinary symptoms in women have multifactorial etiology and vitamin D deficiency appears to be associated with the onset of these changes. In this context, the hypothesis appears that vitamin deficiency will be more common in wom-

en with urinary symptoms. The aim of this study is to determine the prevalence of hypovitaminosis D in women with urinary symptomatology and to compare rates of 25-Hydroxyvitamin D among women with and without symptoms

STUDY DESIGN, MATERIALS AND METHODS
This is a cross-sectional study. We included female subjects aged 18-65 years and divided into two groups, the group of women with urinary symptoms, confirmed by ICIQ-SF or ICIQ-OAB, and a comparator group of women without this symptomatology. The following were excluded from the study: patients with neurological diseases; inflammatory bowel disease, history of bariatric surgery, stage 4 or 5 chronic kidney disease, advanced liver disease, history of stroke, diabetes mellitus, regular use of medications that interfere with the intracellular pathway P450 (phenytoin, phenobarbital, carbamazepine, isoniazid, theophylline, rifampsin and glucocorticoids). The validation instruments used to confirm urinary symptoms were: the International Consultation on Incontinence Questionnaire - Short Form (ICIQ-SF) and the International Consultation on Incontinence Overactive Bladder (ICIQ-OAB) questionnaire. Data collection was performed through an anamnesis containing socio-demographic and clinical information and self-administered questionnaires, filled in individually. After the questionnaires were carried out, serum levels of 25-hydroxy vitamin D were performed. For the categorization of hypovitaminosis, values below 29.9 ng / ml were considered.

RESULTS
168 women were collected, 84 woman had urinary symptoms and 84 without urinary symptoms. The prevalence of hypovitaminosis in women with urinary symptoms was 26 (31%) and in the group without urinary symptoms it was 8 (9.5%) ($p = 0.001$). The mean serum vitamin D content in the group of women with the symptomatology was higher than the comparator, with mean serum values of 44.15 (± 12.62) and 38.23 (± 12.42), respectively ($p < 0.001$). An association between vitamin D deficiency and the highest ICIQ-SF scores ($p < 0.003$) and ICIQ-OAB ($p < 0.038$) were observed. In the final model of logistic regression in the identification of predictors for urinary symptoms, vitamin D deficiency, presence of cystocele, high BMI, pregnancy and episiotomy were identified (Table 1).

INTERPRETATION OF RESULTS
Hypovitaminosis was more frequent in women with urinary symptoms confirming the hypothesis. In an observational study, the association of low serum vitamin D levels with pelvic floor disorders (1, 2) was demonstrated, justifying that vitamin D deficiency is more prevalent in symptomatic incontinent women, since one of the mechanisms that act on urinary continence is the pelvic floor musculature.

CONCLUDING MESSAGE
There is a prevalence of hypovitaminosis D of 31% and a lower mean serum levels of the dosage of 25-hydroxy vitamin D in women with urinary symptoms. Vitamin D was identified as an independent predictor for the presence of urinary symptoms.

FIGURE 1

Table 1 - Final logistic regression model for the presence of urinary symptoms

Variables	OR (CI 95%)	p-value
Hypovitaminosis D	4,18 (1,43-12,2)	0,009
Cystocele	8,01(2,1-30,4)	0,002
BMI	1,09 (1,01-1,18)	0,022
Pregnancy	1,29 (1,03-1,64	0,029
Episiotomy	3,53 (1,55-8,05)	0,003

*Regressão Logistica Multivariada; OR=Odds Ratio; CI = Confidencial Interval

REFERENCES

1. Oberg J, Verelst M, Jorde R, Cashman K, Grimnes G. High dose vitamin D may improve lower urinary tract symptoms in postmenopausal women. J Steroid Biochem Mol Biol. 2017 Oct;173:28-32. doi: 10.1016/j.jsbmb.2017.03.013. Epub 2017 Mar 18.
2. Parker-Autry CY, Markland AD, Ballard AC, Downs-Gunn D, Richter HE. Vitamin D status in women with pelvic floor disorder symptoms. Int Urogynecol J. 2012 Dec;23(12):1699-705. doi: 10.1007/s00192-012-1700-8. Epub 2012 Mar 8.

Funding Foundation of support for research in the state of Bahia **Clinical Trial** No **Subjects** Human **Ethics Committee** Committee of Ethics and Research of the Escola Bahiana de Medicina e Saúde Pública **Helsinki** Yes **Informed Consent** Yes

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"HOLD TILL YOU BUST": A QUALITATIVE EXPLORATION OF NURSES' EXPERIENCES OF URINARY SYMPTOMS IN THE WORKPLACE.

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HYPOTHESIS / AIMS OF STUDY
Suppression of the desire to void is a common practice in nurses (1), however factors influencing nurses' bladder behaviours at work remain poorly understood (2). This is the first known qualitative study to explore nurses' experiences of urinary symptoms in the workplace, using a socio-ecological framework of health behaviour.

STUDY DESIGN, MATERIALS AND METHODS
This study formed part of an exploratory mixed method investigation of the links between pelvic floor dysfunctions and work. Concurrent to the collection of survey data on this topic we used qualitative design for an in-depth exploration of nurses' and midwives' experiences through focus group discussions. Participants were female registered nurses and midwives from a broad range of clinical areas at two urban

hospitals in Sydney, NSW Australia. A schedule of open ended questions guided discussion. Nurses were asked 1) "Do you have any experience of bladder (urinary) symptoms or urine leakage at work that you feel comfortable sharing?" 2) "Are your work activities affected by the experience of symptoms?" and 3) "Are there any work activities that provoke symptoms or make the experience of symptoms worse?"

Discussions were recorded, transcribed verbatim into Microsoft Word, then transferred, stored and managed in NVivo software version 11. An inductive thee-stage process guided data analysis. Open coding of data, led to the creation of categories and subcategories of nurses' and midwives experiences through an iterative process of listening to recordings, in sync with reading the transcribed text. Abstraction of categories provided a conceptual description of the focus group data by the development of major themes and subthemes, guided by a socio-ecological framework of health behaviour (3).

RESULTS

In total, 96 female registered nurses and midwives participated in 12 focus groups held July to September 2016. The mean age of participants was 42.3 years (range 21 to 67 years) and mean number of hours worked each week was 35.5 hours (range 8 to 80 hours). Content analysis confirmed nurses' experience of urinary symptoms at work as primarily related to delaying the urge to void. While a few nurses disclosed difficulty with management of symptoms of urinary dysfunction such as urinary urgency or incontinence, the main discussions focused on nurses' experiences of bladder discomfort from delayed voiding at work. Four key themes explain the major influences on nurses' bladder behaviour: 'nurse culture', the 'nursing team', 'nursing role' and the physical work environment.

For many nurses, a work culture of 'patient-first' care overrode healthy self-care practices. Nurses expressed that they knew that they should be looking after themselves, they just didn't do it. In addition to ignoring the urge to void, some managed urinary urge by purposeful limiting of fluid intakes. Compounding these common workplace practices, social dynamics of inter-personal relationships in the nursing team, between colleagues and with the team leader or nurse manager, influenced nurses' actual or perceived ability to leave patient care for toilet or rest breaks. Further, there were barriers to voiding opportunities arising from practical demands of the nursing patient-care role, fueled by insufficient staffing. Finally, inadequacies in accessibility of female amenities due to distance from or insufficient number in the work area, reinforced nurses' poor self-care practices.

INTERPRETATION OF RESULTS

The influence of the workplace on a nurses' response to bladder cues for bladder emptying is complex, dependent on several mediating influences. Planning for voiding opportunities in an individuals' cultural, social and environmental context is a normal behaviour to maintain continence and effectively manage symptoms of urinary dysfunction. In nurses however, there are several occupational barriers that restrict autonomy over their bladder function. Further, the common practices of delaying voiding and limiting fluids are modifiable behaviours that may be detrimental to health. Solutions for the prevention of nurses' urinary symptoms in the workplace will require strategies that address cultural and social factors, as well as issues of workforce management and toilet access. Practical changes in work environments such as increased staffing, regulation of breaks and improved access to amenities will support nurses' healthy self care practices including autonomy over bladder function. However, changes to nurses' work culture and the social dynamics of nursing teams to improve self-care bladder behaviours may not be as easily addressed.

CONCLUDING MESSAGE

Urinary symptoms from delayed voiding practices are a hidden health burden for the female nursing workforce. A nurse's ability to regularly void, drink and access the toilet as needed in the workplace is an urgent health priority and unrecognised workforce occupational health issue. Communication of results and implications of the findings of this work to managers, heath care organisations and policy makers is vital for the formulation and implementation of strategies to improve the work conditions and the health of female nurses.

REFERENCES

1. Bendtsen, A. L., Andersen, J. R., & Andersen, J. T. (1991). Infrequent voiders syndrome (nurses bladder). Prevalence among nurses and assistant nurses in a surgical ward. Scandinavian Journal of Urology and Nephrology, 25(3), 201-204.
2. Palmer, M. H., Willis-Gray, M. G., Zhou, F., Newman, D. K., & Wu, J. M. (2017). Self-reported toileting behaviors in employed women: Are they associated with lower urinary tract symptoms? Neurourology and Urodynamics, 1-9. DOI: 10.1002/nau.23337
3. Sallis, J. F., & Owen, N. (2015). Ecological models of health behaviour. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), Health behaviour. Theory, research and practice. (5th ed., pp. 43-64). San Fransisco: Jossey-Bass.

Funding Australian Bladder Foundation **Clinical Trial** No **Subjects** Human **Ethics Committee** University of Technology Sydney Human Research and **Ethics Committee**: HREC 2015000478 and South Eastern Sydney Local Health District HREC: Reference No. 15/283(LNR 15/POWH/540). **Helsinki** Yes **Informed Consent** Yes

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HIGH INCIDENCE OF VOIDING DYSFUNCTION IN WOMEN WITH RECURRENT URINARY TRACT INFECTION

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HYPOTHESIS / AIMS OF STUDY

Recurrent urinary tract infection (rUTI) is one of the most common problems in urological outpatient clinic that should not be underestimated. The etiology of rUTIs is not fully understood. Previous studies on voiding dysfunction causing rUTIs are rare. Patients with lower urinary tract dysfunction (LUTD) tend to have abnormal voiding patterns and large post-void residual volume (PVR). The impaired bladder emptying may play an important role in urothelial barrier dysfunction, increasing the susceptibility to bacterial colonization and subsequent UTI. This study aimed to evaluate the voiding dysfunctions identified by video-urodynamic study (VUDS) in women with rUTIs. We also investigated the treatment outcome after individualized treatment.

STUDY DESIGN, MATERIALS AND METHODS

Over a 10-year retrospective study period, 98 female patients with rUTIs underwent VUDS in our hospital were included. Recurrent UTI was defined as at least three UTI episodes over the past one year or two episodes over 6 months. All the underlying disease, urine analysis reports, urine culture results, the results of VUDS findings and the treatment outcome of voiding dysfunction were carefully reviewed and analyzed.

RESULTS

Of the 98 female patients with rUTIs, the mean age was 64.2 ± 15.6 years. Voiding dysfunctions were found in 89 (90.8%) of the patients, including bladder neck dysfunction in 19 (19.4%), detrusor hyperactivity with impaired contractility in 10 (10.2%), detrusor overactivity in 37 (37.8%), detrusor underactivity in 20 (20.4%), dysfunctional voiding in 24 (24.5%), hypersensitive bladder in 22 (22.4%), and poor relaxation of the external sphincter in 19 (19.4%). Only 9 (9.2%) patients had normal urodynamic tracings (Fig.1). Compared with the control group, voiding dysfunctions in women with rUTIs have significant smaller cystometric bladder capacity (338.2 ± 138.0 mL), Qmax (11.9 ± 7.6 mL/s), corrected Qmax (0.6 ± 0.4 mL/s), voided volume (223.5 ± 139.9 mL/s), and significantly higher Pdet (23.1 ± 19.0 cmH2O), and larger PVR (119.3 ± 141.0 mL/s) (Table 1). Only 6 (6.1%) patients with rUTIs were totally free from urinary tract infection after VUDS followed by individualized treatment.

INTERPRETATION OF RESULTS

Voiding dysfunction results in larger PVR, high Pdet and small bladder capacity, which may impair barrier function of the bladder urothelium. Recurrent UTI in these women might not be adequately eradicated unless the voiding dysfunction has been solved.

CONCLUDING MESSAGE

High incidence of urodynamic disorders was identified in women with rUTIs. Despite individualized treatment was given based on the VUDS findings, only few patients could be free from UTI. Factors other than voiding dysfunction should be considered in order to cure rUTIs.

FIGURE 1

Table 1. The findings of video-urodynamic study in women with rUTIs

	Videourodynamic findings in 98 women with recurrent bacterial cystitis							
	Normal (N=8)	Patients with urodynamic disorder (N=89)						Control (N=20)
		BND (N=19)	DHIC (N=10)	DO (N=37)	DU (N=20)	DV (N=24)	HSB (N=22)	PRES (N=19)	
FSF (ml)	151.1 ± 67.4	189.8 ± 84.5	153.1 ± 77.0	122.0 ± 59.8*	175.8 ± 77.7	127.3 ± 64.9	143.2 ±38.0	166.2 ±67.9	160.0 ± 53.6
FS (ml)	231.9 ± 98.2	283.0 ± 129.3	229.0 ± 84.6	177.3 ± 95.9*	282.2 ± 107.4	187.4 ±92.0*	22.01 ± 57.0	256.6 ± 84.7	256.1 ± 96.0
CBC (ml)	318.2 ± 167.0	362.7 ± 169.6	351.0 ± 88.2	285.2 ± 138.5*	338.8 ± 119.2*	289.8 ± 137.5*	275.0 ± 67.9*	379.0 ± 118.3	421.7 ± 110.2
Pdet (cmH2O)	15.4 ± 9.02	24.8 ± 24.6	16.4 ± 9.7	30.9 ± 23.0*	8.8 ± 9.0*	39.8 ± 19.5*	18.1 ± 13.7	21.3 ±17.7	16.2 ± 9.1
Qmax (ml/s)	16.8 ± 5.3	8.61 ± 6.45*	8.3 ± 5.5*	9.83 ± 7.4*	9.8 ± 7.2*	9.0 ± 5.4*	13.1 ±6.8*	13.1 ±10.0*	19.9 ± 3.7
cQmax (ml/s)	1.0 ± 0.3	0.5 ± 0.3*	0.5 ±0.3*	0.6 ± 0.4*	0.5 ± 0.4*	0.6 ± 0.3*	0.78 ±0.4*	0.7 ± 0.4*	1.0 ± 0.2
Volume (ml)	287.1 ± 122.6*	167.7 ± 120.8*	129.0 ±134.9*	145.2 ± 110.4	204.0 ±125.2*	158.7 ± 99.4*	222.7 ±103.9*	247.8 ± 147.6*	416.7 ± 108.1
PVR (ml)	31.1 ± 65.2	203.6 ± 196.7*	222.0 ± 146.2*	143.8 ± 159.0	144.7 ± 139.0*	131.2 ± 126.3*	52.3 ±51.8*	131.1 ± 138.9	5.0 ± 12.8

* Means significant difference compare to Control group, P<0.05

BND: bladder neck dysfunction, CBC: cystometric bladder capacity, cQmax: corrected maximum flow rate, DHIC: detrusor hyperactivity with impaired contractile function, cQmax: corrected maximum flow rate, DO: detrusor overactivity, DU: detrusor underactivity, DV: dysfunctional voiding, FS: full sensation, FSF: first sensation of filling, HSB: hypersensitive bladder, Pdet: detrusor pressure at maximum flow rate, PRES: poor relaxation of external sphincter, PVR: postvoid residual, Qmax: maximum flow rate

FIGURE 2

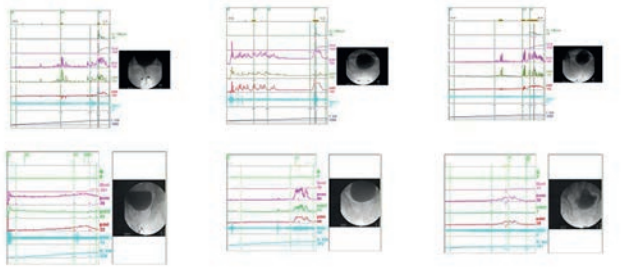

Figure 1. The video urodynamic tracings of (A) Normal (B) dysfunctional voiding, (C) poor relaxation of external sphincter, (D) detrusor underactivity, (E) Bladder neck dysfunction, (F) detrusor overactivity and urethral stricture

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ARE SOLIFENACIN AND MIRABEGRON EFFECTIVE IN DECREASING UNDESIRED URGENCY AFTER MID-URETHRAL SLING SURGERIES?

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HYPOTHESIS / AIMS OF STUDY

Mid-urethral slings (MUS) are considered minimally invasive procedures with relatively low morbidity rate. However, a considerable number of patients after these operations report various undesired postoperative lower urinary tract symptoms (LUTS). Herein, urgency is considered the most bothersome with a significant impact on the patients' post-operative satisfaction.

Therefore, a hypothesis was tested if short-term solifenacin or mirabegron treatment could effectively decrease the percentage of patient suffering from urgency after MUS.

STUDY DESIGN, MATERIALS AND METHODS

Consolidated Standards of Reporting Trials (CONSORT) criteria were followed for the description of this trial. The study protocol was approved by our local institutional ethical committee and all patients gave written informed consent before inclusion. Out of 718 patients with stress urinary incontinence treated in our department, 345 agreed to participate in this study. Women were eligible for the study if they had predominant symptoms of SUI with a positive cough test either in supine or standing positions at bladder volume approximately 250-300 ml, voiding frequency of 7 times or less per day, bladder capacity ≥250 ml, post-void residual (PVR) ≤ 50 ml without clinically relevant pelvic organ prolapse (POP-Q ≤1). Study exclusion criteria were the evidence of obstructed voiding in the absence of prolapse, severe comorbidities, and previous pelvic surgery. Patients were questioned before and after surgery for occurrence of storage symptoms (urgency, increased day time frequency, nocturia) as previously reported. Based on these criteria, the study was conducted on a group of 328 women who had underwent an ambulatory transobturator mid-urethral sling (MUS) procedure with additional tape fixation as previously described. Before discharge, patients were assessed with ultrasonography (post void residual and tape position) and uroflowmetry to exclude the possibility of bladder outlet obstruction. Simple randomization was used from pseudorandom numbers computer-generated to allocate patients into the study groups in a ratio of 1:1:1. Two blinded investigators were not involved in the surgical procedures, but they were responsible for the randomization process. After randomization, 17 patients resigned from participation in this study: 5 from the control group, 1 from the solifenacin group and 11 from the mirabegron group. The remaining patients were then placed into 3 study groups:

1. Without any additional treatment (control group, n=110),

2. Prophylaxis with 10 mg of solifenacin taken orally once daily for 4 weeks (n=114),

3. Prophylaxis with 50 mg of mirabegron taken orally once daily for 4 weeks (n=104).

Follow-up visits were conducted by visis at site at one week and by phone-call survey 6 weeks after surgical intervention.

Statistical analyses were performed with Statistica package version 12.0 (StatSoft Inc., Tulsa, OK, USA). A p value <0.05 was considered statistically significant. Chi-squared test was used as statistical test applied to sets of categorical data to evaluate how likely it is that any observed difference between the sets rose by chance. Interim analysis of data obtained from 65 patients in the control group and 56 in the treatment group showed that for urgency occurrence, 50 participants in each group would be enough to reach more than 95% power of chi2 at a 2-sided significance level of 0.05 for each group.

RESULTS

chi2 at a 2-sided significance level of 0.05 for each group.

Baseline demographic characteristics were similar between all study groups (Table 1).

The evolution of urgency after MUS in study groups is presented in Figure 1.

Both treatment options (mirabegron 50 mg and solifenacin 10 mg) significantly decreased the incidence of urgency at week 1 when compared to the control group. However, solifenacin was more effective in decreasing urgency at week 6 when compared to both mirabegron and control groups.

INTERPRETATION OF RESULTS

In the short-term follow-up period, we observed a significant decrease of urgency in women receiving either solifenacin or mirabegron.

CONCLUDING MESSAGE

Prophylaxis of undesired urgency after MUS with mirabegron or solifenacin can significantly improve patients' satisfaction in the early postoperative period, still, solifenacin effect seems to be more prolonged.

FIGURE 1

Table 1. Demographic characteristics of study groups.

Variable	Control group (n=110)	Treatment group 1 (10 mg of solifenacin) (n=114)	Treatment group 2 (50 mg of mirabegron) (n=104)
Age (years)	55.5 (±11.3)	54.6 (±13.1)	53.6 (±12.2)
BMI (kg/m^2)	27.3 (±3.3)	27.0 (±3.7)	26.8 (±4.2)
Postmenopausal n, (%)	73 (66.4)	69 (60.5)	61 (58.7)
Parity	1.9 (±1.0)	1.9 (±1.0)	1.7 (±1.2)

There was no statistically significant differences between all investigated groups. Continuous variables are presented as the mean±SD. Statistical analysis was performed with Statistica Statsoft, version 12 package, using the $\chi 2$ test, ANOVA with post-hoc tests and the Student t test, as appropriate. A p value<0.05 was considered as statistically significant.

FIGURE 2

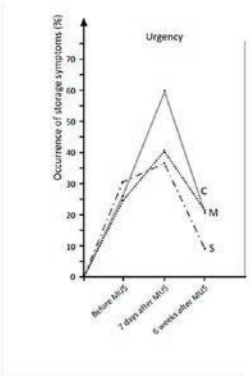

Figure 1. The evolution of urgency after mid-urethral sling surgery in control (C), treatment with mirabegron 50 mg (M) and treatment with solifenacin 10 mg (S) groups.
Before MUS C vs. S (NS); C vs. M (NS); S vs. M (NS)
Week 1. C vs. S (p <0.001); C vs. M (p <0.001); S vs. M (NS)
Week 6. C vs. S (p<0.05); C vs. M (NS); S vs. M (p<0.05)

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Local **Ethics Committee** at Medical University of Lublin **Helsinki** Yes **Informed Consent** Yes

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THERAPY OF URGENCY URINARY INCONTINENCE IN WOMEN - A RANDOMIZED CLINICAL TRIAL TO COMPARE THE EFFECT OF SOLIFENACIN WITH THE STANDARDIZED BILATERAL REPLACEMENT OF THE UTEROSACRAL LIGAMENTS

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HYPOTHESIS / AIMS OF STUDY

The etiology of urinary incontinence is unknown. Beside stress urinary incontinence (SUI), current treatment options are based on a neurological disorder or the detrusor. Ulmsten and DeLancey hypothesized an anatomical defect of the anterior vaginal wall: laxity of the 3 levels (the paraurethral tissue, the apical end and vesicourethral junction). Except SUI, and in regard to materials (length/width) and fixation/implantation sides no standardized surgical treatment for these levels were developed.

We evaluated the effect of bilateral replacement of the uterosacral ligaments (USL) on urgency urinary incontinence and mixed urinary incontinence.

STUDY DESIGN, MATERIALS AND METHODS

Randomized clinical trial comparing solifenacin and cervicosacropexy (CESA) or vaginosacropexy (VASA) in 96 women aged 35-80years with urgency urinary incontinence and mixed urinary incontinence and without previous treatment (ClinicalTrails.gov Identifier: NCT01737411). Efficacy of each treatment arm was assessed 4 months after. Cure was defined as voiding frequency <8 times/day and no involuntary leakage of urine. Polyvinylidene fluoride (PVDF) tapes of identical length were used for open abdominal USL and sutured either on cervix or vaginal stump and placed under the left and right peritoneal fold of the USL and attached to S1/S2 sacral vertebra.

RESULTS

55 patients were operated and 41 patients received the medical treatment. 23 patients (42%) had no symptoms of incontinence anymore after surgery compared to 4 patients (10%) under solifenacin treatment.

In 15 patients (27%) also the stress urinary symptoms disappeared after surgery compared to 1 patient (2%) under Solifenacin treatment.

INTERPRETATION OF RESULTS

Compared to the standard pharmacological treatment these surgical procedure depicts an option in the treatment of UUI.

CONCLUDING MESSAGE

The standardized replacement of the uterosacral ligaments led to continence in 42% of patients with urgency urinary incontinence and in 27% of patients with mixed urinary in-

continence. These results were so different compared to the outcome of standard medical treatment that the study was stopped prematurely.

FIGURE 1

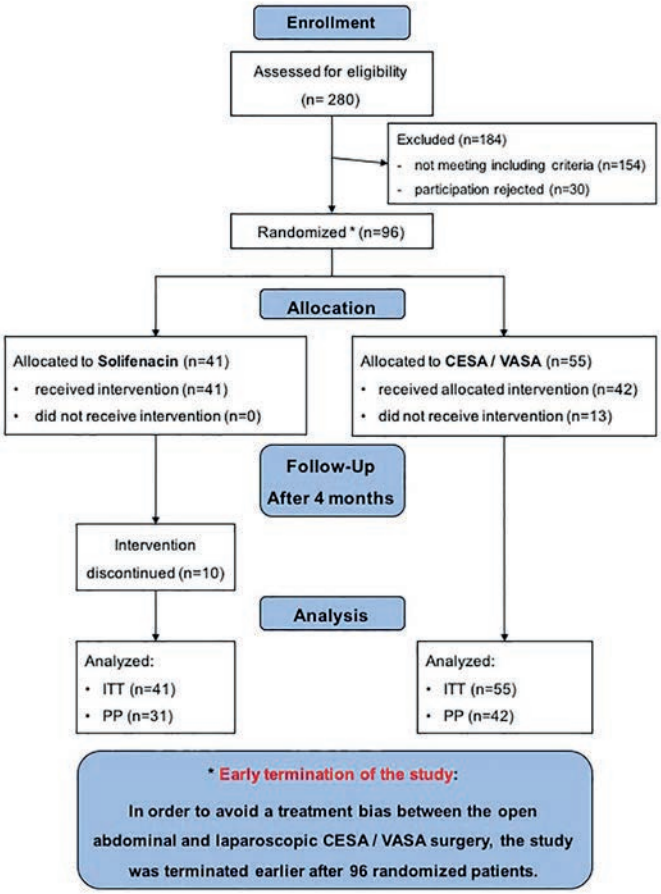
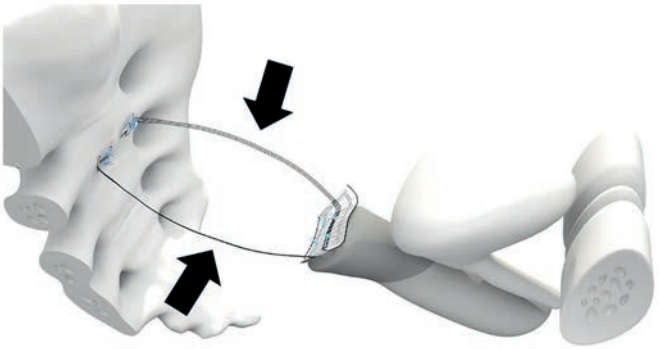


FIGURE 2



Funding None **Clinical Trial** Yes **Registration Number** ClinicalTrails.gov Identifier: NCT01737411 **RCT** Yes **Subjects** None

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TRANSURETHRAL INCISION OF THE BLADDER NECK ON FEMALE BLADDER NECK DYSFUNCTION – LONG-TERM RESULTS AND PREDICTIVE FACTOR IN PATIENTS WITH DETRUSOR UNDERACTIVITY

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HYPOTHESIS / AIMS OF STUDY

Medical treatment does not usually achieve satisfactory results in resuming efficient voidingin patients with detrusor underactivity (DU). We report the long-term surgical outcomes and predictive factor of transurethral incision of the bladder neck (TUI-BN) in women with DU and bladder neck dysfunction (BND).

STUDY DESIGN, MATERIALS AND METHODS

This retrospective study reviewed the medical records and videourodynamic studies of 182 women with voiding dysfunction owing to BND who underwent TUI-BN from 2003 to 2017. Patients diagnosed with DU participated in this study. The urodynamic parameters at baseline and follow-up visits were analyzed. Surgical outcome was determined by comparing preoperative with postoperative urodynamic parameters and clinical presentation. Symptoms assessments of Patient Global Impression of Improvement (PGI-I) and Bristol Female Lower Urinary Tract Symptoms (BFLUTS) questionnaire were also analyzed. Patients with voiding efficiency (VE) >50% were considered to have satisfactory outcomes, and factors predictive of outcomes were also determined.

RESULTS

A total of 77 woman, mean age of 61.0 ± 16.50 years (range 21-86), diagnosed with DU and BND with medical treatment failure received TUI-BN. Fifty two patients were considered as neurogenic etiology and 25 idiopathic. Forty eight patients presented with chronic urinary retention and 10 almost retention (VE <15%). Nineteen patients had difficult micturition with large postvoid residual (PVR) (>150 mL) in 15 and small PVR in 4 (Table 1). Eighteen patients had recurrent urinary tract infections and 9 had upper urinary tract deteriorations. After a mean follow-up of 71.9 months, 29 (37.7 %) patients had satisfactory outcomes. Full follow-up data were available for 54 patients. The mean VE, maximum flow rate (Qmax), voided volume (VV), and PVR significantly improved (Table 2). Ten patients resumed spontaneous voiding by abdominal straining. Indwelling catheter or intermittent catheterization was needed in 60 patients before surgery and in 20 postoperatively. In addition, 50% of the patients reported a decrease in the frequency of intermittent catheterization. PGI-I showed subjective improvements (2.58 ± 1.55) and BFLUTS showed mild symptom severity and impact on quality of life. Baseline Qmax, VV, and PVR were associated with satisfactory outcomes (Table 3); but not revealed as sig-

nificant predictor in the multivariate analysis. Five patients developed urinary incontinence and one developed vesicovaginal fistula.

INTERPRETATION OF RESULTS

The majority of female patients with DU and BND presented with urinary retention or large PVR. Indwelling catheter or intermittent catheterization was needed in more than 60 % of patients. TUI-BN is effective in relieving voiding difficulty, improving VE, increasing Qmax and VV, decreasing PVR, and restoring spontaneous voiding. About 40 % of patients had satisfactory outcomes over the long term. Age, etiology and comorbidity did not impact surgical outcome.

CONCLUDING MESSAGE

TUI-BN is an effective procedure to reduce bladder outlet resistance, improve voiding efficiency, and lead to improvement in quality of life in women with DU and BND. The procedure is durable with acceptable complication occurrence.

FIGURE 1

Table 1. The baseline urodynamic parameters of patients

Patients (N = 77)	Retention (n = 48)	Almost retention (n = 10)	Large PVR (n = 15)	Small PVR (n = 4)	*p* value
FSF (mL)	193±98.8	177±72.5	183±78.6	204±86.8	0.934
FS (mL)	305±127	252±89.5	262±108	295±125	0.469
CBC (mL)	430±183	447±119	564±312	489±87.2	0.187
Compliance (mL/cmH_2O)	90.0±141	63.2±89.0	67.5±118	26.7±28.1	0.732
Pves (cmH2O)	57.7±48.0	58.2±36.3	102±57.0	63.8±22.2	0.023
Pdet (cmH_2O)	5.40±8.04	8.40±14.5	5.13±7.14	6.50±5.07	0.783
Qmax (mL/s)	0.00±0.00	2.40±1.17	7.20±4.99	10.5±5.20	0.000
VV (mL)	0.08±0.58	30.9±18.3	134±71.5	294±73.5	0.000
PVR (mL)	430±183	416±115	430±265	195±91.5	0.142
VE (%)	0.00±0.00	0.07±0.04	0.24±0.88	0.61±0.14	0.000
cQmax (mL/s)	0.00±0.00	0.12±0.06	0.20±017	0.49±0.29	0.000
BCI	5.40±8.04	20.4±13.2	41.1±24.1	59.0±27.1	0.000
BOOI	5.40±8.04	3.60±15.6	-9.27±13.7	-14.5±11.0	0.000

The values were shown as Mean ± SD or N (%), p values were calculated based on AVOVA test, FSF: first sensation of bladder filling, FS: first desire to void, CBC: cystometric capacity, Pdet: detrusor pressure at maximum flow rate, Qmax: maximum flow rate, VV: voided volume, PVR: post-void residual, VE: voiding efficiency = (VV/CBC)*100, BCI: bladder contractility index = Pdet + 5Qmax, BOOI: BOO index = Pdet–2Qmax, cQmax: corrected maximum flow rate = Qmax/√VV

Table 2. Urodynamic parameters before and after TUI-BN

Patients (N= 54)	Pre-operative	Post-operative	*p* value
FSF (mL)	197 ± 95.3	175 ± 79.5	0.143
FS (mL)	306 ± 134	270 ± 113	0.123
CBC (mL)	493 ± 181	433± 234	0.079
Compliance (mL/cmH_2O)	81.2 ± 137	65.6 ± 76.4	0.499
Pves (cmH_2O)	43.1 ± 29.1	76.1 ± 53.7	0.001
Pdet (cmH_2O)	5.02 ± 8.04	8.37 ± 11.4	0.094
Qmax (mL/s)	2.65 ± 4.58	4.83 ± 7.64	0.015
VV (mL)	50.7 ± 87.8	110 ± 153	0.007
PVR (mL)	425 ± 191	310 ± 253	0.001
VE (%)	10 ± 17	29 ± 36	0.000
cQmax (mL/s)	012 ± 0.20	0.25 ± 0.36	0.003
BCI	18.4 ± 25.1	16.6 ± 21.1	0.752
BOOI	-0.69 ± 12.4	-0.82 ± 20.4	0.964

The values were shown as Mean ± SD or N (%), p values were calculated based on Paired-t test, FSF: first sensation of bladder filling, FS: first desire to void, CBC: cystometric capacity, Pdet: detrusor pressure at maximum flow rate, Qmax: maximum flow rate, VV: voided volume, PVR: post-void residual, VE: voiding efficiency = (VV/CBC)*100, BCI: bladder contractility index = Pdet + 5Qmax, BOOI: BOO index = Pdet–2Qmax

FIGURE 2

Table 3. Changes of urodynamic parameters after TUI-BN in responders and non-responders

Patients (N = 54)		Responders (n=21)	Non-responders (n=33)	*p* value
FSF (mL)	Pre-OP	199±107	197±85.4	0.851
	Post-OP	179±93.5	170±66.5	
FS (mL)	Pre-OP	296±124	314±144	0.837
	Post-OP	265±127	275±101	
CBC (mL)	Pre-OP	469±173	514±188	0.973
	Post-OP	410±183	453±273	
Compliance (mL/cmH_2O)	Pre-OP	64.0±84.8	96.4±171	0.385
	Post-OP	67.5±93.5	64.0±59.2	
Pves (cmH_2O)	Pre-OP	67.7±48.1	76.8±62.7	0.557
	Post-OP	68.4±48.9	68.7±54.2	
Pdet (cmH_2O)	Pre-OP	4.30±5.45	5.65±9.86	0.621
	Post-OP	8.70±10.9	8.08±12.0	
Qmax (mL/s)	Pre-OP	3.07±5.39	2.19±3.57	0.000
	Post-OP	8.68±8.92 *	0.69±1.78	
VV (mL)	Pre-OP	54.4±95.5	46.6±80.3	0.000
	Post-OP	199±165 *	13.9±46.9 *	
PVR (mL)	Pre-OP	385±189	468±188	0.011
	Post-OP	190±201 *	439±242	
VE (%)	Pre-OP	0.12±0.20	0.09±0.14	0.000
	Post-OP	0.54±0.34 *	0.02±0.04 *	
cQmax (mL/s)	Pre-OP	0.14±0.23	0.09±0.14	0.000
	Post-OP	0.45±0.39 *	0.03±0.06 *	
BCI	Pre-OP	20.2±27.6	16.6±20.3	0.000
	Post-OP	50.5±44.2 *	11.5±14.6	
BOOI	Pre-OP	-2.91±12.4	1.27±12.2	0.026
	Post-OP	-9.30±24.2	6.69±12.7	

The values were shown as Mean ± SD or N (%), p values were calculated based on Paired-t and T test, *p<0.05 between responders and non-responders, p values of the changes from baseline to follow-up between responders and non-responders

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Research **Ethics Committee**, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation **Helsinki** Yes **Informed Consent** Yes

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BLADDER CONTRACTILITY INDEX IN WOMEN: A CHANGE IN VALUE ?

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HYPOTHESIS / AIMS OF STUDY

Bladder contractility Index (BCI) is an effective Urodynamic tool in the management of patients with complex lower urinary tract symptoms. Previous studies have suggested that a BCI value above 150 denoted a good contractile power of the Detrusor and less than the above value denoted a Detrusor underactivity.

My observation suggested that this contractile index varied in women and seems lower than the current index.The Aim of this study is to derive a Bladder contractility index value for women that it would help in diagnosing detrusor underactivity.

STUDY DESIGN, MATERIALS AND METHODS

A Retrospective study of Urodynamics traces was done in 167 women. Patients with bothersome lower urinay tract symotoms and mixed urinary incontinence, with normal

Urodynamics study was used as Control.Abnormal Urodynamics included Bladder outflow obstruction, Derusor overactivity and Detrusor underactivity or a combination ,were included. Urodynamic values of Detrusor pressure at maximum flow pDet@Qmax and max flow ml/ sec (Qmax) were used to derive the Bladder contractility Index BCI, with the formula, pDet@Qmax+5(Qmax).

RESULTS

Receiver Operating Characteristic (ROC) was drawn and obtained to decide the cut off value of Bladder contractility Index BCI, which differentates good bladder contractility from Detrusor Underactivity group. Cut off value of 113.4, which gives sensitivity of 73% and specificity of 57% seems optimal. AUROC was 0.677(67%) with p value 0.001.

INTERPRETATION OF RESULTS

Bladder contractility Index in normal control group was 143.5+/- 55.8. The other group had contractility index of 116.+/-64. p value 0.017, which is statistically significant. AUROC 67%, p=0.0001. Cut off value of BCI was derived at 113.4, based on Youden Index, with a sensitivity of 73% and specificity of 57% .

Another observation made was a statistically significant p value of p=0.0001 between the normal group BCI= 143.5+/-55 and Bladder outflow obstruction with hypocontractile bladder (or detrusor underactivity) with Impaired contractility BCI= 87+/- 37.AUROC 80% with a cut off value of BCI at 114.5, with a sensitivity of 70% and specificity of 83%.

CONCLUDING MESSAGE

In this cohort of women patients, Bladder contractility Index cut off value of 113.4 with a statistical significance AUROC 67%, p=0.001 with sensitivity 73% and specificity 57% seems optimal. This index value can be used to make a Urodynamic diagnosis of Detrusor Under-activity.

REFERENCES

1. J Urol. 1998 Aug: 160(2): 482-6. Detrusor contraction duration as a urodynamic parameter of bladder outlet obstruction for evaluating men with lower urinarytract symptoms. Ameda K1, Steele GS, Sullivan MP, Stember D, Yalla SV.
2. Investig Clin Urology 2017 Jul;58(4):247-254. doi: 10.4111/icu.2017.58.4.247. Epub 2017 Jun 27. How do we diagnose detrusor underactivity? Comparison of diagnostic criteria based on an urodynamic measure. Jeong SJ1,2, Lee JK1,2, Kim KM1,2, Kook H1,2, Cho SY1,3, Oh SJ1

Funding None **Clinical Trial** No **Subjects** None

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OCCUPATIONAL GROUPS AND LOWER URINARY TRACT SYMPTOMS IN WOMEN

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HYPOTHESIS / AIMS OF STUDY

Current literature suggests differences in the prevalence of incontinence symptoms by occupation in women [1]. We hypothesized that infrequent urination in the workplace may contribute to increased lower urinary tract symptoms (LUTS), including incontinence, in women. To inform our hypothesis, we conducted a secondary analysis of existing data from the Boston Area Community Health (BACH) Survey, a large population-based study of Boston residents, with detailed LUTS data and occupational groupings.

STUDY DESIGN, MATERIALS AND METHODS

At baseline, women provided information on their presence of LUTS and occupation. Using the United States Department of Labor's Standard Occupational Classification (SOC) system, we categorized women into 1 of 11 groups. We used a response option of at least "a few times" or more to explore the relation between SOC groups and LUTS presence. LUTS examined included storage symptoms, voiding symptoms, incontinence, and bladder pain in the past month. Women also recalled the frequency of urinary tract infections in the past year. Prevalence estimates were weighted to account for the BACH sampling design. Prevalence ratios (PRs, 95% CI) were calculated by log-link generalized linear models with robust variance estimation, adjusting for age, education, and fluid intake. Women in the Office and Administrative Support SOC group were used as the reference group given their potential for fewer workplace restrictions in toileting.

RESULTS

Of the 2,789 women who provided complete data, 61% reported currently working for pay; 11% were retirees, 10% disabled, 7% homemakers, and 7% unemployed. Office and Administrative Support (n=510, 18%) and Service (n=866, 31%) were the most common SOC groups. Overall, 63% of women reported one or more LUTS; ranging from 54% to 82% across the SOCs. The most common LUTS were storage symptoms (increased daytime urinary frequency, nocturia, and urgency); least common were voiding (hesitancy, slow stream), and incontinence symptoms (non-stress/non-urgency incontinence). Women in Computing, Engineering, and Science (n=59) had an increased prevalence of overall LUTS (PR=1.3, 1.1-1.5), as well as hesitancy (PR=4.0, 1.6-10.5) and daytime urinary frequency (PR=1.9, 1.5-2.5), compared to the reference group, $p<0.05$. Women in Service had a higher prevalence of nocturia (PR=1.4, 1-1.8), $p<0.05$, and women in Production (n=193), Transportation and Material Moving (n=58), and Management, Business, and Finance

(n=202) had a lower prevalence of at least 2 or more individual LUTS, including urgency, intermittency, urgency incontinence, hesitancy, and increased frequency of urinary tract infections, compared to the reference group, p<0.05. Women in Healthcare (n=133), Education (n=415), and Unemployed women (n=140) did not have a significantly higher or lower prevalence of LUTS compared to women in the reference group.

INTERPRETATION OF RESULTS

Women in Computing, Engineering, and Science occupations were 30% more likely to report LUTS, including storage and voiding symptoms, compared to women in Office and Administrative Support positions even after adjusting for age, education, and fluid intake.

CONCLUDING MESSAGE

Our cross-sectional findings suggest that LUTS vary across women by occupational groups. Future studies should examine this relationship prospectively to inform the influence of toileting in the workplace on LUTS and the influence of LUTS on occupational status.

REFERENCES

1. Pierce H, Perry L, Chiarelli P, Gallagher R. A systematic review of prevalence and impact of symptoms of pelvic floor dysfunction in identified workforce groups. J Adv Nurs 2016.

Funding Grants DK106786, DK106853, DK106858, DK106898, DK106893, DK106827, DK106908, DK106892 **Clinical Trial** No **Subjects** Human **Ethics Committee** University of Minnesota **Helsinki** Yes **Informed Consent** Yes

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ENDURING IMPACT OF CHILDHOOD ADVERSITY ON LUTS IN ADULT WOMEN

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HYPOTHESIS / AIMS OF STUDY

Introduction: Childhood adversity is associated with increased risk for multiple medical and behavioral health conditions in adulthood. Impact of such experiences on risk for lower urinary tract symptoms (LUTS) is unknown, despite the relationship between early life stress and affective disorder symptoms and the relationship between LUTS and depression and anxiety.

Objective: To determine whether childhood adversity measured using the 10-item Adverse Childhood Experiences (ACE) Questionnaire is associated with self-report of LUTS among older women.

Hypothesis: High levels of childhood adversity before the age of 18 years-old programs is associated with increased risk of LUTS among mid-life and older women. Those in the high ACE group will be more bothered by their LUTS.

STUDY DESIGN, MATERIALS AND METHODS

Methods: Women who participated in a previous study of urological health or presented for evaluation of LUTS to the urology service at a large academic center were asked to complete the LUTS Tool (Coyne et al 2012) to assess frequency and bother of 18 LUTS in the previous month. In addition, they completed demographic and health questionnaires, ACE Questionnaire, Perceived Stress Scale (PSS), Spielberger State Trait Anxiety Inventory (STAI) and the Center for Epidemiologic Studies Depression Scale (CES-D). Data were analyzed for total LUTS Tool score and number of symptoms by ACE levels 0,1,2,3 or >4. LUTS Tool scores and number of LUTS were log transformed.

RESULTS

Results: The average age (SD) of participants (n=135) was 65.3 (6.9) years and the vast majority were graduates of college (49.6%) or graduate/professional school (35.6%). ACE groups did not significantly differ on demographic variable, number of vaginal deliveries, or use of hormones, but body mass index (BMI) increased with ACE level (p=0.029). Average scores for the STAI, PSS, and CES-D were within the asymptomatic range for the entire group, though there was a significant effect of ACE level in the expected direction for the STAI (p=0.015), the PSS (p=0.003) and the CES-D (p<0.0001). Controlling for important demographic and behavioral variables including STAI, PSS and CES-D, ACE level was significantly associated with total LUTS Tool score (Beta=.115, p=.040) and number of LUTS meeting our frequency threshold (Beta=.13; p=.017), but not symptom bother. Individual LUTS associated with ACE level were "feeling bladder not empty after voiding" (p=.037), "delay in urine flow" (p=.011), urine leakage with "laughing, sneezing, coughing" (p=.005) and "physical activity" (p=.0009).

INTERPRETATION OF RESULTS

Conclusions: Childhood adversity has enduring impact on risk for LUTS in this educated sample of older women even when controlling for affective symptoms which are common among women who experience urinary incontinence and other LUTS. Mechanism(s) underlying this relationship require further study. The lack of an association with ACE level and LUTS "bother" may be secondary to participant accommodation and management of symptoms.

CONCLUDING MESSAGE

These data support the growing evidence that childhood adversity adversely impacts numerous adult health outcomes, leading to a lower quality of life for our growing elderly population. Health care providers working with women who complain of LUTS should assess the presence of early life stress and consider interventions to improve well-being. Neuroscientists should collaborate with urologists and urogynecologists to identify mutable factors to decrease risk and enhance resilience for LUTS among women with history of childhood adversity.

REFERENCES

1. Basal and stress-activated hypothalamic pituitary adrenal axis function in postmenopausal women with overactive bladder. Smith AL, Hantsoo L, Malykhina AP, File DW, Valentino R, Wein AJ, Sammel MD, Epperson CN. Int Urogynecol J. 2016 Sep;27(9):1383-91.

Funding R01 AG048839, **Clinical Trial** No **Subjects** Human **Ethics Committee** University of Pennsylvania IRB **Helsinki** Yes **Informed Consent** Yes

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LOWER URINARY TRACT SYMPTOMS ARE COMMON IN WOMEN WITH FEMALE GENITAL MUTILATION

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HYPOTHESIS / AIMS OF STUDY

Female genital mutilation (FGM) involves the partial or total removal of the external female genitalia. The practice has no known health benefits but has both immediate and long-term health risks. Little is known about the impact of FGM on lower urinary tract symptoms (LUTS). The primary objective of our study was to describe the prevalence, bother and quality of life (QOL) impact from LUTS in women living with FGM in the United States. We hypothesized that women with FGM will experience a high prevalence of and bother from LUTS.

STUDY DESIGN, MATERIALS AND METHODS

We queried English-speaking women with FGM through partnerships with case workers, immigration lawyers, and physician asylum evaluators. Participants completed an anonymous online questionnaire, including demographics and validated assessments of LUTS: Female Lower Urinary Tract Symptoms questionnaire (FLUTS) to assess symptom prevalence/bother and Pelvic Floor Impact Questionnaire-7 (PFIQ-7) to assess QOL impact from pelvic floor disorders. FLUTS has 12-items, each with prevalence (never-0, occasionally-1, sometimes-2, most of the time-3, always-4) and bother (not at all-0 to a great deal-10) scores. We considered a score ≥2 (at least sometimes) as positive for having the symptom. Total FLUTS symptom scores range from 0 to 48. The PFIQ has 7 items assessing the impact of pelvic floor symptoms on QOL. Items are scored from 0 (not at all) to 3 (quite a bit bothered). Total scores range from 0-300. There are no established cut-off points for the FLUTS or PFIQ-7. Statistical analysis was performed with SPSS version 24 (Chicago, IL). Data are reported as median (IQR). Correlations were calculated using Spearman's rho.

RESULTS

30 women, with median age 29 (24-40) are included. 67% self-identified as black/African, 23% East Asian, 7% Caucasian, and 3% South Asian. 77% were Muslim and 23% were Christian. Women were circumcised between age 1-week and 16-years (median 6 years). 40% reported type I circumcision (clitoridectomy), 23% type II (clitoridectomy with labia minora excision), 23% type III circumcision (type II with infibulation of the introitus), and 13% were unsure. 50% were vaginally parous with 33% of these reporting tearing into their urethra and 10% into their anal sphincter at delivery. Urinary tract infections were common: 46% since circumcision; 26% in last year; 10% had > 3 UTIs in the last year.

73% of women reported at least one LUTS (Table 1). 27% voided ≥ 9 times per day; 60% had nocturia ≥ 2 times. Bothersome voiding symptoms were commonly reported: urinary hesitancy (40%), strained urine flow (30%) and intermittent urine stream (47%). 53% reported urgency urinary incontinence (UUI) and 43% stress urinary incontinence (SUI). Total FLUTS score was 19 (9-25). There was no difference in FLUTS scores of nulliparous and parous women, of women with various types of circumcision, or between age at circumcision and LUTS. FLUTS bother score was 5.5 (3.7-7.5). Symptom prevalence and bother were strongly correlated for all 12-items (rho=0.51-0.90, p<0.001). PFIQ score was 102 (8-144) with 63% reporting urinary symptoms having "moderate" or "quite a bit" of impact on their activities, relationships or feelings.

INTERPRETATION OF RESULTS

In addition to the known risks of FGM such as hemorrhage, infection and future obstetric trauma, childhood genital trauma is associated with chronic lower urinary tract symptoms. LUTS, especially voiding dysfunction and nocturia, are common in women with FGM and are extremely bothersome.

CONCLUDING MESSAGE

Providers caring for patients with FGM should inquire about and offer treatment for LUTS.

FIGURE 1

Table 1. ICIQ-FLUTS Scores

Score	Urgency	Bladder Pain	Hesitancy	Strained Flow	Intermittent Flow	SUI	UUI	Insensate UI	Enuresis
0 – Never	4 (13%)	9 (30%)	12 (40%)	10 (33%)	7 (23%)	6 (20%)	8 (27%)	15 (50%)	15 (50%)
1 - Occasionally	8 (27%)	7 (23%)	6 (20%)	10 (33%)	9 (30%)	11 (37%)	6 (20%)	6 (20%)	8 (27%)
2- Sometimes	10 (33%)	8 (27%)	0 (0%)	8 (27%)	6 (20%)	9 (30%)	12 (40%)	8 (27%)	7 (23%)
3- Most of the time	5 (17%)	6 (20%)	8 (27%)	2 (7%)	6 (20%)	3 (10%)	2 (7%)	1 (3%)	0 (0%)
4- All the time	3 (10%)	0 (0%)	4 (13%)	0 (0%)	2 (7%)	1 (3%)	2 (7%)	0 (0%)	0 (0%)
>0 (any symptoms)	26 (87%)	21 (70%)	18 (60%)	20 (67%)	23 (77%)	24 (80%)	22 (73%)	15 (50%)	15 (50%)
≥2 (at least sometimes)	**18 (60%)**	**14 (47%)**	**12 (40%)**	**10 (33%)**	**14 (47%)**	**13 (43%)**	**16 (53%)**	**9 (30%)**	**7 (23%)**

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Northwestern University Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

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FEMALE PRIMARY BLADDER NECK OBSTRUCTION, REPORT OF 24 CASES, DIAGNOSIS, TREATMENT AND MANAGEMENT OF COMPLICATIONS

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HYPOTHESIS / AIMS OF STUDY

We performed a retrospective analysis in our female population presenting primary bladder neck obstruction in the last five years describing the clinical findings, our method of diagnosis, and surgical approach with our results and complications in the management of this patients comparing it with the published data.

STUDY DESIGN, MATERIALS AND METHODS

A retrospective analysys of our medical records was made, during period of time 2012 to 2017, in female patients who were diagnosed with primary bladder neck obstruction. All the patients underwent a physical examination and were asked for a laboratory with renal function, Urine culture, bladder diary, Validated pre-treatment questionnaires (IPSS and EVA), ultrasonography with voiding residual assessment, cistoscopy and pressure-flow study with X ray images or videourodynamics, according to availability. The postsurgical evaluation was performed with measurement of RPM, free uroflumetry, IPSS and EVA, with periodic controls being performed up to 5 years after the intervention.

RESULTS

A total of 25 patients were diagnosed with PBNO in our center. 3 cases (12%) the initial reason for consultation was acute urinary retention (RAO), in 1 case (4%) associated with bilateral uronephrosis and acute renal failure; the rest of the series, 21 patients (88%), reported filling phase symptoms (as frequency, urgency, nocturia) associated with voiding disorders (decrease in the size of the voiding stream, post voiding dribbling). The initial treatment in all the patients was kinesics evaluation and alpha blockers. Of this 25 patients, 17 (68%) were refractory to initial treatment, and they progress to a surgical resolution. The bladder neck section was systematically performed in bladder neck at 5 and 7 hours, with subsequent periodic controls and a follow-up of up to 72 months (mean of 36 months). In our series, postoperative free flow doubled to preoperative one (mean 14.42 ml / sec), postsurgical IPSS decreased 83% (from 22 to 3.75) and EVA decreased 69.5% (from 6 to 1.83). 2 patients (11.7%) presented a recurrence of the PBNO, and were re-operated surgically, achieving a satisfactory desobstruction. 1 of these patients (5.8%) developed a cervicovaginal fistula, which required open surgical repair and other patient (5.8%) developed postoperative overactive bladder symptoms that initially improved with anticholinergics, subsequently yielding spontaneously.

INTERPRETATION OF RESULTS

The largest series with respect to PBNO in female patients, with a mean follow-up of 27.4 months, reported a clear symptomatic improvement and satisfaction rates in 84.5% of the patients who underwent surgery. Among the complications, they describe a rate of recurrence of 7.14% with re-intervention requirement, 3.6% of vesicovaginal fistula subsequently successfully repaired, 3.6% of urethral stricture requiring posterior urethral dilatations and 4.7% of urinary incontinence that needed a suburethral mesh. Our study is consistent with the international reports.

CONCLUDING MESSAGE

For all the above we can conclude that the female PBNO, is an uncommon condition in women but that should not be underestimated. Once the suspicion of female urinary outlet obstruction is established, the urodynamic evaluation is imposed under fluoroscopic guidance to confirm it and arrive at an accurate diagnosis. Once the conservative measures have been exhausted, in order to achieve a satisfactory response, the endoscopic section of the bladder neck can be used which in our experience proved to be a safe method with satisfactory results but which requires experience and, although as any medical procedure is not free of complications they can be resolved .

REFERENCES

1. Bladder nack incision for female bladder neck obstruction: long term outcomes; Pheng Zhang & cols. Urology 83 (4) 2014.
2. Controlled transurethral resection and incision of the bladder neck to treat female primary bladder neck obstruction: Description of a novel surgical procedure Wenhao Shen & cols. International Journal of Urology (2016) 23, 491-495
3. Urodynamic diferences between dysfunctional voiding and primary bladder neck obstruction in women; Benjamin M. Brucker – Urology 80 (1) 2012.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** hospital carlos g durand **Helsinki** Yes **Informed Consent** Yes

221 www.ics.org/2018/abstract/221

EXPLORATION OF LITOXETINE (LTX): A POTENTIAL NOVEL TREATMENT FOR MIXED URINARY INCONTINENCE (MUI)

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HYPOTHESIS / AIMS OF STUDY

LTX is an oral selective serotonin reuptake inhibitor and a multifunctional serotonin agonist antagonist. Serotonin plays an important role in centrally and peripherally modulating the reflexes of continence/micturition; 5-HT potentiates the guarding reflex which allows continence by increasing urethral pressure and inhibiting the micturition

reflex. Animal studies (1,2) have confirmed that LTX increases urethral pressure, urethral sphincter activity and bladder capacity. These data support the therapeutic potential of LTX for the treatment of urinary incontinence (UI) and specifically mixed urinary incontinence (MUI). Approximately 35% of women affected by UI suffers from the subtype MUI. As there is currently no medical treatment available for MUI, this represents a significant unmet medical need.

STUDY DESIGN, MATERIALS AND METHODS

The study is a double blind randomized placebo-controlled parallel group phase 2 dose ranging study to evaluate the efficacy, safety and tolerability of 3 doses of litoxetine versus placebo BID in women with mixed urinary incontinence (MUI), defined as having at least 7 incontinence episodes per week (at least 3 of which are stress incontinence episodes). The study design includes a 2-week Screening Period; a 2-week, single-blind (subject blind) Placebo Run-in Period and a 12-week double-blind Treatment Period which is followed by a 1-week Dose-tapering Period. The single- blind Placebo Run-In period serves to control for the placebo effect, which is expected to be relatively large in this type of studies. To reduce bias and to estimate more accurate baseline values for efficacy, the number of incontinence episodes at baseline is defined as the average number of episodes recorded in the last seven days of the placebo run-in period.

Efficacy is measured by an electronic diary. The primary efficacy is defined as percentage (%) change from end of the Placebo Run-in Period to Week 12 in the number of incontinence episodes/24 hours, and absolute change from baseline is the lead secondary endpoint. The % change is a traditional and informative measure for responses expected to be small counts, e.g the magnitude of a reduction of 1 episode depends on the baseline measure; a reduction from 5 to 4 episodes (20%) is not as meaningful a change as a reduction from 2 to 1 episodes (50%) although both are 1 absolute episodes.

Patients reported outcomes are measured as secondary variables. To assess the impact of the urinary incontinence status on quality of life the Kings Health Questionnaire is performed throughout the study. To provide additional clinical information on the subjects' condition and change the Patient Perception of Bladder Condition (PPBC) and the Patient Global Impression of Improvement (PGI-I) are used throughout the study as global measures for bladder function and to assess patient perception of severity and symptom change.

Safety and tolerability are assessed throughout the study.

RESULTS

One-hundred and forty four female subjects aged 18-75 years of age, of 195 subjects estimated to be randomized, suffering from MUI for at least 3 months are included in this blinded review of baseline characteristics and safety information. Patient recruitment is greatest in Ukraine, followed by Georgia, Poland, Canada, UK and France.

The recruited population have the following baseline characteristics (mean ± SD):

Age 56±12 (years)

BMI 27.6±3.1 (kg/m2)

Number of all incontinence episodes over 7 days: 43.9±21.9

Number of urge episodes over 7 days: 31.8±19.8

Number of stress episodes over 7 days: 21.1±11.1

The blinded assessment of baseline characteristics does not suggest any differences in the patient population across sites or across the participating countries. The patients report a significant degree of incontinence at baseline. The data also suggest that the patient population is willing, capable and competent to use a hand held electronic device for recording of the patient reported outcomes.

A blinded safety review of treatment emergent adverse events (TEAE) revealed that 43 subjects reported 75 TEAEs. One of these events (somnolence) was reported as an SAE. Five subjects were discontinued from blinded study medication due to TEAEs: the serious event of somnolence reported above; events of vomiting, nausea, hyperhidrosis, rash and weakness in 1 subject; tachycardia in 1 subject; dizziness, asthenia, and hypoesthesia in 1 subject; and migraine and dyspepsia in 1 subject - all of the events resolved. The most frequently reported TEAEs were nausea (8 subjects, 5.9%), somnolence (5 subjects, 3.7%), diarrhoea (4 subjects, 2.9%), and asthenia/fatigue (4 subjects, 2.9%), followed by dry mouth, vomiting, urinary tract infection, headache and insomnia (3 subjects, 2.2% each).

INTERPRETATION OF RESULTS

The study started in Q1 2017. The baseline data reported correspond to almost 75% of the targeted study population to be recruited. These baseline assessments show a random variability, without a trend for site or country variability. Blinded review of adverse events suggest LTX treatment in the female patient population suffering from MUI seems safe and tolerated.

CONCLUDING MESSAGE

These are the first clinical data obtained with LTX in a development program for UI. The data from this study in women with MUI will be complemented by an ongoing US study in men and women suffering from UI. Taken together, the ongoing LTX development program will explore the optimal dose level and posology (fixed dose, dose titration), and will include data obtained in female and male subjects.

In order to adequately evaluate potential psychiatric effects of LTX, patients with current treatment of depression are excluded from the study. In France subjects with a history (past 6 months) of depression in the subject or in a close family member are also excluded, and the MINI neuropsychiatric

interview is used to further determine in/exclusion into the study. In the US study, patients with a current diagnosis or history (past 6 months) of depression are excluded, and patient questionnaires are used to characterize psychiatric status over the duration of the study. FDA has also agreed on a set of adverse event of psychiatric interest to be monitored.

To date, the blinded data safety review from 144 randomized subjects in the phase 2 study does not suggest that litoxetine treatment is associated with development or worsening of depression or any other psychiatric disease in subjects with mixed urinary incontinence.

The authors are indebted to all participating patients and investigators.

REFERENCES

1. M. Méen, M. Guérard, X. Gamé, P. Lluel Effects of litoxetine on urethral pressure and detrusor overactivity in anesthetized female rats European Urology Supplements 16 (3):e185, 2017
2. F. Pérez-Martinez, P. Lluel, R. Vela-Navarrete Effects of litoxetine on acetic acid-induced detrusor overactivity and striated anal sphincter functions in rabbits: Comparison with duloxetine European Urology Supplements 16 (3):e354, 2017

Funding Clinical trial sponsored by Ixaltis SA **Clinical Trial** Yes **Registration Number Clinical Trial**s Registry Europe, EudraCT 2016-004307-30 **RCT** Yes **Subjects** Human **Ethics Committee** Central **Ethics Committee**s in the UK and France and local **Ethics Committee**s in the other four participating countries **Helsinki** Yes **Informed Consent** Yes

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ROLE OF P38 MITOGEN-ACTIVATED PROTEIN KINASE IN HYPEREXCITABILITY OF CAPSAICIN SENSITIVE BLADDER AFFERENT NEURONS IN MICE WITH SPINAL CORD INJURY

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HYPOTHESIS / AIMS OF STUDY

Chronic spinal cord injury (SCI) rostral to the lumbosacral level causes detrusor overactivity (DO) during the storage phase, which is mediated by spinal reflexes triggered by hyperexcitable C-fibre afferent pathways. In normal condition, Aδ-fibre bladder afferents are involved in micturition reflexes, while in chronic SCI condition, excitability of C-fibre bladder afferents is increased, therefore inducing neurogenic DO evident as non-voiding bladder contractions (NVCs) before micturition in rodent models of SCI [1]. It is also known that the second messenger signalling pathways activated by nerve growth factor (NGF) utilize p38 Mitogen-Activated Protein Kinase (p38 MAPK) [2], which is a serine-threonine kinase that is activated by phosphorylation and mediates cellular responses to a variety of chemical and physical insults [3]. However, it has not been clarified whether p38 MAPK activation contributes to the changes in electrophysiological properties of bladder afferent pathways following SCI. Therefore, in the present study, we examined effects of a p38 MAPK inhibitor on DO and electrophysiological properties of capsaicin sensitive bladder afferent neurons with SCI mice.

STUDY DESIGN, MATERIALS AND METHODS

Female C57BL/6 mice (8-10 weeks old, 18-22 g) were used. These mice were divided into 3 groups: spinal intact group (SI, n=22), spinal cord injury group (SCI, n=20), and SCI group treated with p38 MAPK inhibitor group (SCI + p38 MAPK inhibitor, n=15). In the mice SCI and SCI + p38 MAPK inhibitor groups, the Th8/9 spinal cord was completely transected under isoflurane anesthesia. In SI group, sham operation was performed. After spinal cord transection, their bladders were manually squeezed to eliminate urine once daily for 4 weeks until cystometric and electrophysiological evaluation. Two weeks after the spinal cord transection, an intrathecal catheter was positioned at the level of the L6-S1 spinal cord via an incision in the dura at the L1 vertebra under isoflurane anesthesia. An osmotic pump was connected to the intrathecal catheter and replaced subcutaneous space in the back. SB203580 (p38 MAPK inhibitor) (1 mg/ml) was continuously supplied intrathecally at infusion rate of 0.51 µl/hr for 2 weeks. Instead of SB203580, artificial cerebrospinal fluid was supplied in separate groups of SI and SCI mice as controls. Awake cystometry was performed to evaluate the bladder activity. To label the population of DRG neurons innervating the bladder, a retrograde fluorescent tracer Fast Blue (FB; 1.8% weight per volume) was injected into the bladder wall under isoflurane anesthesia. Seven days after the FB injection (=4 weeks of SCI), DRG neurons were enzymatically dissociated and incubated at 37.0 °C in 5% CO2 per 95% air overnight before patch clamp experiments. Whole cell recordings were performed to evaluate the characteristics of action potentials and isolated voltage-gated potassium (Kv) currents in capsaicin-sensitive, FB-labeled C-fibre bladder afferent neurons. Two major types of Kv currents expressed in small-sized DRG neurons, namely slow decaying A-type K+ (slow KA) and sustained delayed rectifier-type K+ (sustained KDR) currents were evaluated. In these neurons; slow KA currents are activated by depolarizing voltage steps from hyperpolarized membrane potentials and inactivated when the membrane potential is maintained at a depolarized level more than -40 mV, therefore, slow KA currents are estimated by the difference in these currents activated by depolarizing voltage pulses from a holding potential (HP) of -40 mV and from a HP of -120 mV.

RESULTS

In cystometry, NVCs during bladder filling were significantly reduced in SCI + p38 MAPK inhibitor group compared to SCI group (Figure). In patch-clamp recordings, the thresh-

old for eliciting action potentials was significantly reduced in SCI group compared to SI group. Also, the number of action potentials during 800 ms membrane depolarization in SCI group was significantly increased compared to SI group. Densities of slow KA and sustained KDR currents evoked by depolarization to 0 mV in capsaicin sensitive bladder afferent neurons in SCI group were significantly lower than those measured in SI groups. SB203580 treatment significantly reversed SCI-induced changes of the threshold, the number of action potentials and the density of slow KA current, but not KDR (Table).

INTERPRETATION OF RESULTS

We indicated that (1) SCI mice exhibit DO evident as NVCs, (2) capsaicin-sensitive bladder afferent neurons from SCI mice showed hyperexcitability, evident as decreased spike thresholds and increased firing rate of action potentials compared to neurons from SI mice, (2) slow KA and sustained KDR current densities of capsaicin-sensitive bladder afferent neurons from SCI mice were decreased compared to those from SI mice, and (3) p38 MAPK inhibitor treatment for two weeks significantly reversed SCI-induced DO and changes of spike thresholds, firing rate and slow KA current density. These results indicate that p38 MAPK that is activated via NGF-Trk A pathways has an essential pathophysiological role in SCI-induced hyperexcitability of capsaicin-sensitive bladder afferent neurons that underlie SCI-induced DO.

CONCLUDING MESSAGE

We functionally and electrophysiologically demonstrated that the p38 MAPK signalling pathway significantly contributes to C-fibre dependent DO after SCI and is a potential target for the treatment of SCI-induced lower urinary tract dysfunction.

FIGURE 1

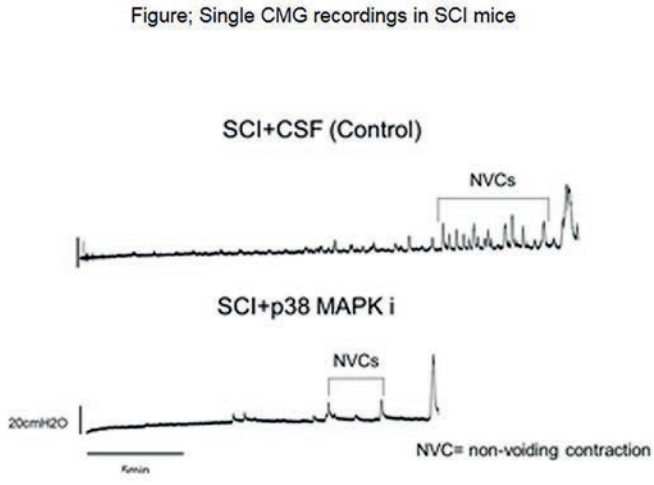

FIGURE 2

Table; Electrophysiological properties of capsaicin sensitive bladder afferent neurons

	SI	SCI	SCI + p38 MAPK inhibitor
Spikes:			
Number of cells/mice	19/13	24/11	20/8
Diameter (μm)	25.4 ± 4.8	29.3 ± 3.8*	28.5 ± 3.8*
Input capacitance (pF)	26.9 ± 11.6	36.6 ± 10.4*	36.1 ± 10.6*
Resting membrane potentials (mV)	−50.0 ± 0.29	−50.0 ± 0.68	−50.0 ± 0.31
Spike threshold (mV)	−21.5 ± 8.7	−31.2 ± 5.2*	−19.3 ± 8.4*
Peak membrane potential (mV)	39.7 ± 21.1	37.0 ± 15.6	48.5 ± 15.0*
Spike duration (ms)	2.3 ± 1.0	3.7 ± 1.4*	2.5 ± 1.8*
Number of spikes (800-ms depolarization)	1.1 ± 0.3	5.3 ± 4.1*	1.1 ± 0.3*
K^+ current density:			
Number of cells/mice	24/9	24/9	18/7
Slow decaying K_A current density (pA/pF)	48.4 ± 35.8	22.6 ± 14.6*	49.4 ± 26.3*
Sustained K_{DR} current density (pA/pF)	120.7 ± 80.1	54.9 ± 35.4*	63.2 ± 29.9*

Values are means ± SD. *$P < 0.05$ and *$P < 0.05$, when compared with the Bonferroni method to the SI and SCI group, respectively. K_A, A-type K^+; K_{DR}, delayed rectifier-type K^+; SCI, mice with spinal cord injury; SI, spinal cord intact mice; SCI + p38 MAPK inhibitor, SCI mice treated with p38 Mitogen-Activated Protein Kinase inhibitor (0.51 μg per hour, i.t.) for 2 weeks.

REFERENCES

1. de Groat WC, Yoshimura N. Mechanisms underlying the recovery of lower urinary tract function following spinal cord injury. Prog Brain Res 152: 59–84, 2006.
2. Ji RR, Samad TA, Jin SX, Schmoll R, Woolf CJ. p38 MAPK activation by NGF in primary sensory neurons after inflammation increases TRPV1 levels and maintains heat hyperalgesia. Neuron 26: 57-69, 2002.
3. Cuenda A, Rousseau S. p38 MAP-kinases pathway regulation, function and role in human diseases. Biochim Biophys Acta 1773: 1358-1375, 2007.

Funding NIH P01-DK093424, DOD W81XWH-17-1-0403 **Clinical Trial** No **Subjects** Animal **Species** Mouse **Ethics Committee** University of Pittsburgh

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BEST IN CATEGORY PRIZE "NEUROUROLOGY"

SYMPTOMS OF DIABETIC BLADDER DYSFUNCTION MAY BE EXPLAINED BY SPECIFIC NLRP3-INDUCED CHANGES IN BLADDER AFFERENT NERVES.

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HYPOTHESIS / AIMS OF STUDY

Diabetes is a growing epidemic in the United States, with projections that 1 in 3 Americans will be affected by 2050. As a chronic disease, diabetes is associated with high costs and various complications leading to end organ dysfunction. The most common of these complications is diabetic bladder dysfunction (DBD), with a prevalence as high as 87%. Recently, it has been established that inflammation in specific tissues underlies the vast majority of these complications. This inflammation is triggered by a multimeric complex known as the NLRP3 inflammasome. Accordingly, our laboratory has shown that NLRP3 plays a critical role in the symptoms of DBD. In this original study, we have evaluated whether NLRP3 mediates changes in specific nerve cell pop-

ulations in the bladder that could explain functional deficits in diabetic patients, specifically diminished sensation (fullness) and overactivity. Sensation of bladder fullness is transferred to the CNS via Aδ-fibers, large myelinated afferent nerves in the bladder wall, while overactivity is thought to be triggered through C-fibers, small non-myelinated afferent nerves in the urothelium [1,2]. For these, and related, studies our lab has crossed a genetically diabetic mouse strain (the Akita mouse) with a NLPR3-/- strain to create a diabetic mouse lacking NLRP3 expression. We then utilize this novel model to assess the effect of NLRP3 on nerve sub-types during DBD.

STUDY DESIGN, MATERIALS AND METHODS

Four groups of 15 week old mice were used: 1) control non-diabetic mice, 2) diabetic mice (Akita), 3) NLRP3-/- (null) non-diabetic mice, 4) NLRP3-/- (null) diabetic (Akita) mice. Previous studies from our lab have documented these diabetic mice (Akita) develop DBD symptoms at this time point and that deletion of NLRP3 had no effect on blood glucose in the nondiabetic or diabetic mouse. Blood glucose was assessed with a standard glucometer following lancing of the submandibular vein. For evaluation of neuronal changes in number and density, bladders were fixed in neutral buffer formalin, embedded in paraffin and sectioned (5 µm). Transverse sections from the lower third of the bladder were stained with a rabbit anti-NF-200 antibody (for Aδ-fibers) or a rabbit anti-calcitonin gene-related peptide (CGRP) antibody (for C-fibers) and visualized with a goat anti-rabbit IgG antibody conjugated to Alexa Fluor 488 using standard methods and citrate antigen retrieval (pH 6.0). The entire cross sections were imaged (20X) with Zen software, using tiling micrographs stitched into a continuous image by the software, and exported as TIFF files. Files were then imported into NIS Elements software and calibrated. A hue spectrum or manual extraction was used to create a region of interest (ROI) composed of the bladder wall for Aδ-fibers and the urothelium for C-fibers. The area of the ROIs was then provided by the software in µm2 and individual neurons marked and counted. Aδ-fibers were defined as fluorescent areas >50 um2 that stained positive with a nuclear co-stain (DAPI), which was used to exclude blood vessels containing auto-fluorescent red blood cells. C-fibers were defined as continuous fluorescent fibers >1 µm. Data was reported as the mean ± standard error (SEM). Statistical analyses were performed using GraphPad InStat software (GraphPad Software, inc., La Jolla, CA) and a one-way ANOVA with a Turkey's post-hoc test. Results were considered significant at $P < 0.05$.

RESULTS

As shown in Figure 1A, there was a marked decrease in the number of Aδ-fibers of diabetic mice compared to the non-diabetic controls [(n=6) ($p<0.001$)]. No differences were seen in the size of the bladder wall (Figure 1B). This decrease in nerve count, correlated with no change in bladder wall size, results in a dramatic decrease in Aδ density (Figure 1C) ($p<0.001$) in the diabetics. Importantly, diabetes had no effect on either the number of Aδ fibers (Figure 1A) or their density (Figure 1C) in the NLRP3-/- mice. Diabetes caused a significant increase in C-fiber number within the urothelial layer (Figure 2A) with no change in the size of the urothelium (Figure 2B) ($p<0.05$) and, thus, an increase in C-fiber density (Figure 2C) ($p<0.001$). Similar to Aδ-fibers, the diabetic change in C-fibers was completely absent in the NLRP3-/- mice (Figures 2A-C).

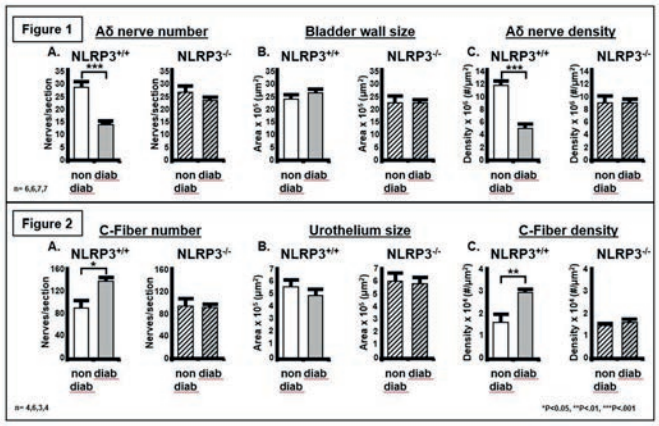
INTERPRETATION OF RESULTS

The decrease in Aδ-fiber number and density in the diabetic mice suggests that a lack of sufficient signaling through these fibers may be a possible mechanism by which diabetics experience reduced bladder sensation. Early DBD is also associated with bladder activity, which we have previously demonstrated in 15 week old diabetic mice. The increase in C-fiber number and density in the diabetic mice suggest a possible mechanism by which early DBD causes bladder overactivity. Ultimately, the absence of these pathologic changes in the diabetic NLRP3-/- mice suggests that the NLRP3 inflammasome may play an important role in these neuropathic changes and subsequent development of symptoms of early DBD.

CONCLUDING MESSAGE

Activation of the NLRP3 inflammasome in diabetes plays a critical role in the development of DBD symptoms, by decreasing Aδ-fibers and increasing C-fibers within the bladder. This novel study illustrates that inhibition of this inflammasome may serve as a potential target to prevent the development of DBD.

FIGURE 1



REFERENCES

1. Birder LA. Nervous network for lower urinary tract function. International journal of urology : official journal of the Japanese Urological Association. 2013;20(1):4-12. doi: 10.1111/j.1442-2042.2012.03210.x. PubMed PMID: 23088378; PMCID: PMC4036083.
2. Fowler CJ, Griffiths D, de Groat WC. The neural control of micturition. Nat Rev Neurosci. 2008;9(6):453-66. doi: 10.1038/nrn2401. PubMed PMID: 18490916; PMCID: PMC2897743.

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SILDENAFIL REDUCES PRE- AND POST-GANGLIONIC STIMULATED CONTRACTIONS IN THE MOUSE URINARY BLADDER

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HYPOTHESIS / AIMS OF STUDY

Lower urinary tract symptoms (LUTS) associated with bladder diseases such as overactive bladder and neurogenic bladder dysfunction, are highly prevalent and have a severe effect on the quality of life of patients. Current treatments for LUTS have recognised limitations, including uncertain efficacy and adverse effects. PDE type 5 (PDE5) inhibitors like sildenafil (Viagra ®) have been found to alleviate LUTS; however, a complete understanding of its actions on peripheral control of bladder contractility remains unclear. Previously, we have demonstrated that sildenafil reduces low-frequency, purinergic mediated contractions and selectively inhibits neuronal ATP release in vitro [1]. In this study, the effects of sildenafil on nerve-mediated contractions of the whole mouse bladder in situ were characterised and compared to nerve-mediated contractions of the isolated mouse bladder in vitro. A comprehensive description of how sildenafil reduces contractile function should give insight into the pathology of bladder disease and may suggest a potential therapeutic mechanism of PDE5 inhibitors in their treatment.

STUDY DESIGN, MATERIALS AND METHODS

Young (12 weeks old) female mice were administered heparin (50 IU, i.p.) and deeply anaesthetised with isoflurane (2%) until loss of paw withdrawal reflex for the following non-recovery procedure. The procedure has been modified from previously described methods for the use of in situ arterially-perfused mouse preparations [2]. The brain was removed, and the spinal cord was pithed with a blunt wire before arterial perfusion of the preparation. The ureters were ligated bilaterally to prevent natural bladder filling, the urethra was clamped, and a catheter was used to record bladder pressure and maintain isovolumetric conditions in the bladder lumen. A glass suction electrode was used to stimulate the left pelvic nerve (0.1 ms pulses, 1-24 Hz, 3-s train every 90-s; Figure 1A), once it has been identified and dissected. The amplitude of bladder pressure movements (mmHg) was analysed, and drug interventions were delivered arterially. Female mice were used due to difficulties in successfully dissecting and stimulating pelvic nerve in male mice. To investigate contractions in vitro, bladders were removed from similarly-aged mice and detrusor strips were tied to an isometric force transducer in a horizonal superfusion chamber. Nerve-mediated contractions (tetrodotoxin-sensitive) were generated by electrical field stimulation (EFS: protocol as for pelvic nerve stimulation), and drug interventions were delivered via the superfusate. Contraction amplitude was normalised for tissue preparation weight (mN.mg-1). Frequency-relationships were used to determine maximum pressure/tension (Pmax / Tmax), the frequency to attain Pmax/2 or Tmax/2 (f1/2, Hz), and the ratio at low and near maximum frequencies (P2/20 / T2/20). Data are means ± SD, n=number of experiments. Differences between data sets were analysed by ANOVA; the null hypothesis was rejected at $p<0.05$.

RESULTS

Preganglionic pelvic nerve stimulation in situ generated frequency-dependent intravesical bladder pressure transients in the bladder (n=6). Sildenafil (20 μM) reduced these pressure transients (Figure 1B) from: 2.26 ± 0.59 mmHg to 1.48 ± 0.51 mmHg at 2 Hz stimulation; 5.46 ± 1.28 mmHg to 3.57 ± 0.92 mmHg at 8 Hz stimulation; 7.01 ± 1.69 mmHg to 5.39 ± 1.21 mmHg at 20 Hz stimulation ($p<0.05$). The addition of sildenafil had no effect on the Pmax from 7.04 ± 3.41 mmHg to 5.66 ± 1.21 mmHg, but increased the f1/2 from 3.41 ± 0.37 to 5.21 ± 0.48 ($p<0.05$). Similarly, sildenafil (20 μM) reduced the amplitude of EFS-induced contractions in vitro (n=8, Figure 1C) from: 0.53 ± 0.12 mN/mg to 0.17 ± 0.04 mN/mg at 2 Hz stimulation; 1.26 ± 0.25 mN/mg to 0.59 ± 0.13 mN/mg at 8 Hz stimulation; 1.56 ± 0.31 mN/mg to 1.05 ± 0.25 mN/mg at 20 Hz stimulation ($p<0.05$). The addition of sildenafil had no effect on the Tmax from 1.58 ± 0.21 mN/mg to 1.30 ± 0.27 mN/mg, and increased the f1/2 from 3.37 ± 0.47 to 7.56 ± 0.92 ($p<0.05$).

Figure 1. (A) Schematic diagram illustrating the arterially-perfused in situ mouse model used for preganglionic pelvic nerve stimulation. (B) Pelvic nerve stimulation in situ; the effect of sildenafil (20 μM) on pressure transient magnitudes at frequencies between 1-24 Hz. (C) Nerve-mediated stimulation of isolated detrusor preparations; the effect of sildenafil (20 μM) on contraction magnitudes at frequencies between 1-24 Hz.

INTERPRETATION OF RESULTS

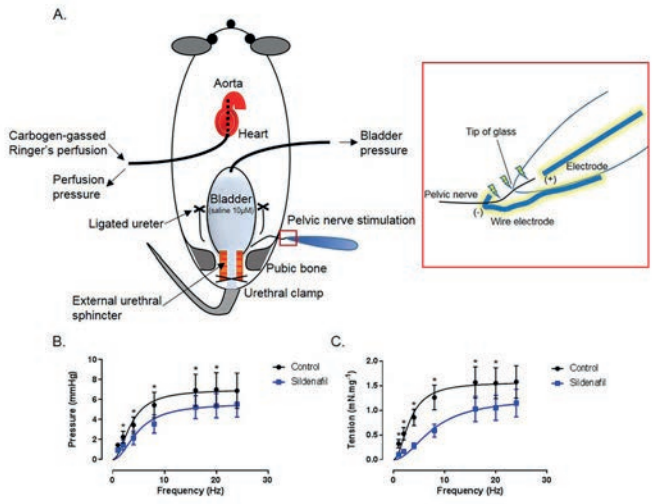
Parasympathetic preganglionic axons in the pelvic nerve provide the principal excitatory pathway to post-ganglionic fibres in the pelvic ganglia which ultimately result in co-ordinated detrusor smooth muscle contraction that causes voiding. In the current study, the preganglionic pelvic nerve was identified in an arterially-perfused whole mouse in situ model. Stimulation of the pelvic nerve resulted in a frequency-dependent increase of bladder pressure comparable to what is observed in in vitro contractility studies using detrusor muscle strips. Sildenafil reduced nerve-mediated bladder contractions in situ, with an increase in the f1/2 value, similar to observations in vitro. Sildenafil reduced the magnitude of pre- and post-ganglionic stimulated contractions in the mouse bladder, by similar proportions which presumes the ganglia are simple relays and do not regulate the frequency-dependence of nervous excitation to the bladder.

Nerve-mediated contractions are dominated by ATP release at low frequencies, and ACh release at higher frequencies [3]. An increase in the f1/2 value further supports the predominant effect of sildenafil at the low frequency, purinergic component of nerve-mediated contractions [1]. The cellular pathways that mediate this action of sildenafil are undergoing characterisation.

CONCLUDING MESSAGE

Similarities between the whole bladder in situ preparation and in vitro contraction experiments further validate the translation of stimulating postganglionic nerve terminals as a model to study the dependence of bladder contraction on pelvic nerve stimulation. The description of the parasympathetic ganglia as simple one-to-one relays simplifies our understanding of the excitatory pathway. Sildenafil reduces preganglionic pelvic nerve-stimulated whole bladder contractions in situ and postganglionic nerve-mediated contractions in vitro, demonstrating an action of sildenafil at postganglionic nerve-terminals innervating detrusor smooth muscle principally by reducing nerve-mediated ATP release at postganglionic fibres.

FIGURE 1



REFERENCES

1. CHAKRABARTY, B., ITO, H., XIMENES, M., VAHABI, B., PICKERING, T., KANAI, A., DRAKE M., FRY, C. 2017. The effects of sildenafil on bladder contractility and neuronal ATP release in the mouse urinary bladder. Podium short oral, 47th Annual meeting of International Continence Society (ICS) 2017 in Florence.
2. ITO, H., DRAKE, M. J., FRY, C. H., KANAI, A. J. & PICKERING, A. E. 2018. Characterization of mouse neuro-urological dynamics in a novel decerebrate arterially perfused mouse (DAPM) preparations. Neurourol Urodyn.
3. TSAI, M. H., KAMM, K. E., STULL, J. T. 2012. Signalling to contractile proteins by muscarinic and purinergic pathways in neutrally stimulated bladder smooth muscle. J Physiol, 590, 5107-21.

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CHANGES IN EXPRESSION OF GROWTH INHIBITORY PROTEINS AT THE LUMBOSACRAL CORD ARE ASSOCIATED WITH SPROUTING OF SENSORY AFFERENTS AFTER THORACIC SPINAL CORD INJURY

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HYPOTHESIS / AIMS OF STUDY

Spinal cord injury leads to loss of voluntary control over bladder function followed by the emergence of neurogenic detrusor overactivity (NDO), characterized by strong involuntary detrusor contractions that result in urinary incontinence. NDO results from neuroplastic changes occurring in the lumbosacral cord, particularly from growth of the central processes of bladder afferents, which does not occur in non-lesioned conditions. The fine mechanisms regulating this abnormal sprouting are still unresolved but may reflect changes in the expression and effects of repulsive cues that block axonal growth. These repulsive cues include myelin associated inhibitors (MAIs), such as Nogo-A, and astrocyte-derived chondroiting sulfate proteoglycans (CSPGs), as phosphacan. In the CNS, these repulsive proteins prevent regrowth of damaged axons that express their specific receptors by inducing growth cone collapse. It is unclear if these repulsive cues are present and regulated in the lumbosacral cord following thoracic SCI and if bladder afferents respond to these proteins adjusting growth accordingly, as measured with GAP-43 expression, an established marker of sprouting of bladder afferents [1].

STUDY DESIGN, MATERIALS AND METHODS

Adult female Wistar rats were used and submitted to largely incomplete spinal cord transection (SCT) at T8/T9 thoracic spinal segments T8/T9 [1, 2]. Animals were divided into three experimental groups (n=8/group). One group of female rats was used as control and not submitted to spinal lesion. Another two groups of rats were submitted to spinal cord injury and left to recover for 7 days (n=8) or 28 days (n=8). Seven (7 dpi) or 28 days post-injury (28 dpi), all animals underwent 1-hour cystometry under urethane-anaesthesia, followed by spinal cord tissue collection. Lumbosacral spinal cords (L5-S1) were processed for Western Blotting and Immunohistochemistry and expression and distribution of GAP-43, Phosphacan and Nogo-A were determined.

RESULTS

Spinal intact animals had the normal pattern of bladder contractions. In contrast, at 7 days post-SCT dpi, bladder reflex contractions were abolished, reflecting spinal shock

(p≤0.0001 compared with spinal intact). At 28 dpi, NDO was evident in all animals, with a significant increase in frequency and amplitude of detrusor contractions (p≤0.0001 versus 7 dpi animals).

Western blot analysis of lumbosacral tissue showed a significant increase of Nogo- A and Phosphacan expression at 7 dpi (p≤0.05 versus spinal intact), the expression of which was reduced at 28 dpi. Preliminary tests found a time-dependent increase in GAP43 expression, as suggested by other studies [1, 3].

Immunostaining was used to determine the spinal distribution of Nogo-A, Phosphacan and GAP43. In spinal intact animals, Nogo-A was mostly present in the dorsolateral funiculus. At 7 dpi, Nogo-A the intensity of the immunostaining was stronger in comparison with spinal intact animals. Twenty-eight days post-SCT, location and intensity of Nogo-A immunoreaction was similar to that observed in spinal intact rats. In spinal intact animals, Phosphacan was expressed in the superficial dorsal horn (medial and lateral), the dorsolateral and ventral funiculus and in some motoneurons of the ventral horn. Following SCT, specifically 7 dpi, staining intensity increased, returning to values similar to spinal intact animals at 28 dpi. GAP-43 was present in the superficial dorsal horn (where bladder afferents are known to terminate), dorsal commissure and corticospinal tract and the dorsolateral funiculus in spinal intact animals. GAP-43 expression increased 7 days and 28 days post-injury in identical regions of the lumbosacral spinal cord, except for the dorsal corticospinal tract, where expression was practically abolished by SCT. It was possible to observe lack of co-expression of GAP43 in Phosphacan and Nogo-A positive spinal areas.

INTERPRETATION OF RESULTS

Results suggest that, following thoracic SCT, changes in the expression of growth-repellent proteins, particularly Phosphacan and Nogo-A, occur at distant sites from the lesion, particularly the lumbosacral cord. Increased levels of these repulsive cues were accompanied by sprouting of bladder afferents, as shown by GAP43 expression, and may be linked to NDO development.

CONCLUDING MESSAGE

This study demonstrates that changes in the expression of repulsive cues, typically observed at lesioned tissue and subsequent scar, are not restricted to the injury but extend caudally, affecting the lumbosacral cord. Thus, response to injury is not restricted to the scar but is a widespread event impacting general recovery and development of SCI-induced pathophysiological processes, as NDO emergence. Though it is unclear if sensory neurons recognize centrally expressed growth-repellent cues, observations here suggest that bladder afferents may express receptors for Phosphacan and Nogo-A, a matter to be clarified in ongoing studies.

FIGURE 1

	Spinal intact (A)	SCT – 7 dpi (B)	SCT – 28 dpi (C)
Frequency (voidings/min)	0.66±0.22	0±0****	0.84±0.30####
Peak pressure (cm H_2O)	35.70±5.12	31.08±11.43	38.30±11.96
Amplitude (cm H_2O)	25.33±3.04	4.78±2.92****	20.30±6.52####

Data is presented as mean±standard deviation. ****p≤0.0001 compared to A. ####p≤0.0001, compared to B.

REFERENCES

1. Frias B, Santos J, Morgado M, et al. The role of brain-derived neurotrophic factor (BDNF) in the development of neurogenic detrusor overactivity (NDO). J Neurosci. 2015 Feb 4: 35:2146-60
2. de Groat WC, Kawatani M, Hisamitsu T, et al. Mechanisms underlying the recovery of urinary bladder function following spinal cord injury. J Auton Nerv Syst. 1990 Jul: 30 Suppl:S71-7
3. Vizzard MA. Alterations in growth-associated protein (GAP-43) expression in lower urinary tract pathways following chronic spinal cord injury. Somatosens Mot Res. 1999: 16:369-81

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A NOVEL EP2 AND EP3 RECEPTOR DUAL AGONIST IMPROVES LOWER URINARY TRACT FUNCTION IN A DIABETIC RAT MODEL OF UNDERACTIVE BLADDER

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HYPOTHESIS / AIMS OF STUDY

Pharmacological management of underactive bladder (UAB) needs more effective drugs. In a diabetic rat model that has been considered the most representative animal model of UAB, it was reported that EP3 receptors could be potential pharmacological targets [1]. We have reported that a novel EP2 and EP3 dual agonist, ONO-8055, improved lower urinary tract function in animal models of UAB, such as a rat lumbar canal stenosis model [2] and a primate post-radical hysterectomy model [3]. In this study, we investigated the effects of ONO-8055 on lower urinary tract function in a diabetic rat model. Our hypothesis was that ONO-8055 would decrease post-void residual urine volume (PVR) and bladder capacity (BC) in the diabetic rat model.

STUDY DESIGN, MATERIALS AND METHODS

We used streptozotocin-induced diabetic Sprague Dawley rats with PVR greater than 0.1 mL (mean ± SE; 0.24 ± 0.03 mL). An average of sixteen weeks after the induction of dia-

betes, we performed awake single cystometry after the oral administration of the vehicle, tamsulosin (TAM, 0.1 and 0.3 mg/kg), distigmine (DIS, 0.3 and 1.0 mg/kg), or ONO-8055 (0.01 and 0.03 mg/kg). We compared PVR (mL), residual urine rate (RUR, %), maximum intravesical pressure during voiding (Pmax, mmHg), and BC (mL) after administration of vehicle and drugs, using a paired t-test. $P<0.05$ was considered to be statistically significant.

RESULTS

TAM significantly decreased Pmax, while DIS significantly increased it (Figure). However, neither drug significantly affected PVR or RUR. On the other hand, ONO-8055 significantly decreased PVR and tended to decrease RUR (Figure), although this drug did not significantly affect Pmax. Moreover, no tested drugs had a significant effect on BC.

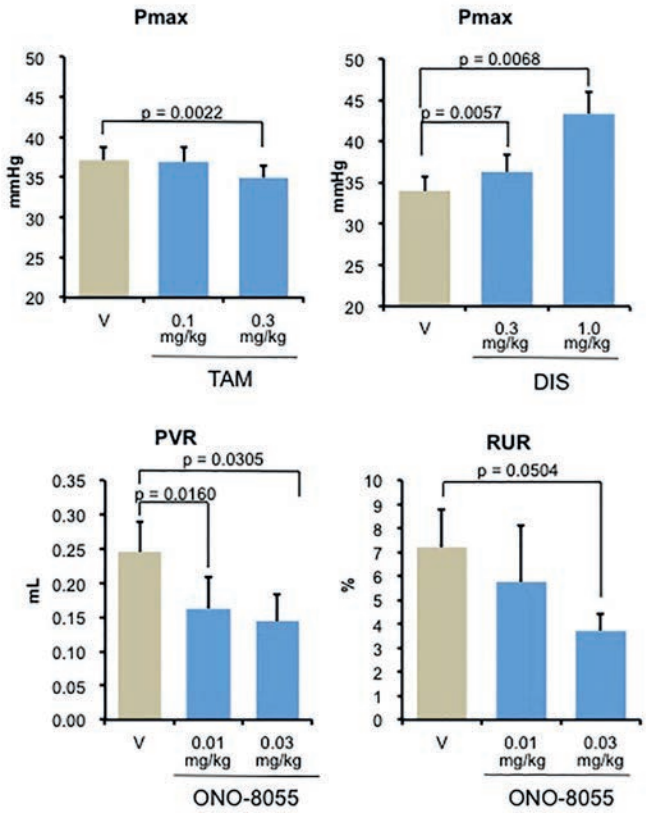
INTERPRETATION OF RESULTS

TAM decreased Pmax by lowering urethral pressure, while DIS increased Pmax by augmenting detrusor contractility in the diabetic rat model. However, neither drug decreased PVR. A proposed reason is that TAM did not augment detrusor contractility and DIS did not lower urethral pressure, which was suggested in a neuropathic UAB model [2]. On the other hand, ONO-8055 has been reported to augment detrusor contractility as well as lower urethral pressure [2], which probably results in a decrease in PVR without a significant change in Pmax in the diabetic rat model. Although we expected ONO-8055 to reduce BC according to the previous report [1], this drug did not cause any significant changes in BC. This suggests that a mechanism of action of ONO-8055 could be different in neuropathic UAB models [2,3] and the diabetic UAB model; further studies are needed to elucidate this difference.

CONCLUDING MESSAGE

A novel EP2 and EP3 receptor dual agonist showed promising effects on lower urinary tract function in a diabetic rat model of UAB.

FIGURE 1



REFERENCES

1. PLoS ONE 9:e102644. Doi:10.1371/journal.pone.0102644
2. Urol 2016;196:609-16
3. Low Urin Tract Symptoms 2017 Apr 25. doi: 10.1111/luts.12166

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EXPRESSION OF HYPOXIA AND FIBROSIS RELATED GENES IN PATIENTS WITH NEUROGENIC LOWER URINARY TRACT DYSFUNCTION UNDERGOING BLADDER AUGMENTATION

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HYPOTHESIS / AIMS OF STUDY

Neurogenic lower urinary tract dysfunction (NLUTD) is common in patients with different neurological diseases. Neurological conditions that affect the suprasacral segments of the spinal cord are often accompanied by detrusor overactivity and detrusor sphincter dyssynergia (DSD). The resulting high detrusor pressures that are seen in these patients are

a well-known risk factor for bladder deterioration and upper urinary tract damage. In the long term, patients with such lesions may progress with bladder fibrosis and decreased bladder compliance. Evidence from studies with animal models of bladder outlet obstruction (BOO) and also from bladder samples from men with BOO due to benign prostatic hyperplasia indicate that hypoxia plays a significant role in BOO-induced bladder dysfunction. As the bladder intramural tension increases, there is decreased blood flow and consequent detrusor hypoxia. Chronic bladder ischemia may result in impaired detrusor contractility and decreased bladder compliance. The cellular adaptation that occurs as a response to hypoxic events is primarily mediated by the hypoxia-inducible factors (HIF's). The HIF-related pathway is responsible for the activation of other key genes in the remodeling and adaptation process to hypoxia, such as vascular endothelial growth factor (VEGF), nitric oxide synthase (NOS) and connective tissue growth factor (CTGF). In the present study we evaluated the expression of genes associated with hypoxia and fibrosis in the bladder of patients with NLUTD requiring bladder augmentation.

STUDY DESIGN, MATERIALS AND METHODS

We analyzed bladder specimens from 17 patients with NLUTD caused by diseases affecting the suprasacral spinal cord who underwent bladder augmentation due to low bladder compliance or detrusor overactivity refractory to conservative treatment. All subjects provided written informed consent and the study was approved by the Ethics Committee. Preoperative urodynamics was performed in all patients. A full thickness bladder sample was collected during the bladder augmentation surgery. The bladder biopsies were prepared for relative gene expression analysis with quantitative real-time polymerase chain reaction (RT-PCR) of MMP-1, TIMP-1, HIF1α, HIF2α, HIF3α, iNOS, eNOS, VEGF and CTGF. The control group included bladder specimens obtained from nine cadaveric organ donors. Expression levels of the RNA were analyzed by qRT-PCR using an ABI 7500 Fast RT-PCR System (Applied Biosystems). Data were expressed as medians and interquartile ranges or absolute values and fractions. Confidence interval were calculated with natural logarithm transformation.

RESULTS

The group was composed of 13 men and 4 women and the mean age was 37 years ± 18.33 (range 11-60). The cause of NLUTD was spinal cord injury in 10 patients (58.82%), myelomeningocele in 4 patients (23.52%) and inflammatory diseases in 2 patients (11.76%). The median duration of neurological disease was 12 years (range 3-24). Urodynamic findings demonstrated mean maximum cystometric capacity of 260 ± 63.50 mL, mean bladder compliance of 17.95 ± 16.80 mL/cmH20 and 7 (41.17%) patients had detrusor overactivity. Patients with NLUTD had statistically significant overexpression of TIMP-1, HIF1α and HIF3α and HIF2α showed a trend to overexpression. MMP-1 was underexpressed in patients with NLUTD and the expressions of VEGF, CTGF, eNOS, and iNOS was heterogeneous. Data are shown in Table 1.

INTERPRETATION OF RESULTS

We investigated the expression of genes related to hypoxia and fibrosis in the bladder of patients with NLUTD who underwent bladder augmentation due to low bladder compliance or refractory detrusor overactivity. This is the first study to evaluate the HIF-related pathway in the bladder of patients with NLUTD. We showed overexpression of HIF 1 and 3 and a trend to overxpression of HIF 2. These findings are consistent with animal studies showing a role for hypoxia in the mechanisms leading to bladder fibrosis and seem to indicate that it is also important in patients with NLUTD. In our series, however, we did not find overexpression of VEGF, CTGF and nitric oxide synthase, which are important genes in the remodeling and adaptation process to hypoxia. These findings may be due to the heterogeneity of our population and to the long time of disease duration compared to the other models studied until this date.

CONCLUDING MESSAGE

Our study is the first to investigate the HIF-related pathway in the pathophysiology of the bladder decompensation in patients with NLUTD. We demonstrated the overexpression of HIF1α, HIF 3α and TIMP-1 and underexpression of MMP-1 in the detrusor layer of patients with NLUTD undergoing bladder augmentation.

FIGURE 1

	Significantly Predominant Pattern	Subjects with the predominant pattern	*p-value*
HIF1α	Overexpressed	80.00%	*0.02*
HIF2α	Overexpressed	70.58%	*0.11*
HIF3α	Overexpressed	92.85%	*0.02*
CTGF	Heterogeneous	-	*0.21*
VEGF	Heterogeneous	-	*0.62*
iNOS	Heterogeneous	-	*0.43*
eNOS	Heterogeneous	-	*0.50*
MMP1	Underexpressed	92.3%	*0.03*
TIMP1	Overexpressed	93.75%	*0.03*

REFERENCES

1. Drzewiecki BA, Anumanthan G, Penn HA, Tanaka ST, Thomas JC, Adams MC, Brock JW 3rd, Pope JC 4th, Matusik RJ, Hayward S, Clayton DB. Modulation of the hypoxic response following partial bladder outlet obstruction. J Urol. 2012 Oct;188(4 Suppl):1549-54. doi: 10.1016/j.juro.2012.02.037. Epub 2012 Aug 19. PubMed PMID: 22910264.
2. Stephany HA, Strand DW, Ching CB, Tanaka ST, Milne GL, Cajaiba MM, Thomas JC, Pope JC 4th, Adams MC, Brock JW 3rd, Hayward SW, Matusik RJ, Clayton DB. Chronic cyclic bladder over distention up-regulates hypoxia dependent pathways. J Urol. 2013 Oct;190(4 Suppl):1603-9. doi: 10.1016/j.juro.2013.02.026. Epub 2013 Feb 19. PubMed PMID: 23429070; PubMed Central PMCID: PMC4085185.
3. Wiafe B, Adesida A, Churchill T, Adewuyi EE, Li Z, Metcalfe P. Hypoxia-increased expression of genes involved in inflammation, dedifferentiation, pro-fibrosis, and extracellular matrix remodeling of human bladder smooth muscle cells. In Vitro Cell Dev Biol Anim. 2017 Jan;53(1):58-66.

doi: 10.1007/s11626-016-0085-2. Epub 2016 Sep 8. PubMed PMID: 27632054.

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THE SEX INFLUENCES METABOTROPIC GLUTAMATE RECEPTOR SUBTYPE 1 PHENOTYPE IN CONTROL OF LOWER URINARY TRACT ACTIVITY

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HYPOTHESIS / AIMS OF STUDY

In previous study, unanesthetized female mice that lack for metabotropic glutamate receptor subtype 1 (mGluR1) gene presented much greater micturition volume, compared with wild type mice [1]. Meanwhile, other study showed that systemic administration of mGluR1 antagonist only has little effects on lower urinary tract activity in conscious male rats [2]. The different results between the two studies may be attributable to the species; however, the sex difference as an influential factor should not be ignored.

Recently, medical research has started to understand the importance of taking the sex into account as the gene-associated phenotypes and response to drug treatment may be very different between sexes. Thus, the aim of this study was to examine if mGluR1 gene-associated phenotype in lower urinary tract activity is affected by the sex.

STUDY DESIGN, MATERIALS AND METHODS

We used 12-13 week-old mGulR1-knockout (KO) mice (n=18 for each sex) that were backcrossed on a C57BL/6N background as well as wild-type (WT) littermates. In this study, a dual analysis of voiding behavior and reflex micturition was conducted to examine lower urinary tract function in these mice [3]. For evaluating micturition behavior, conscious mice were individually placed in metabolic cages, and frequency-volume charts (FVC) were measured. For assessing reflex micturition, mice were decerebrated under sevoflurane anesthesia and cystometrogram (CMG) recordings were conducted under unanesthetized conditions by continuously infusing saline (10 µl/min). Evaluated parameters are: water intake (ml/day), urine output (ml/day), number of voiding (i.e., urinary frequency) (times), and urine volume/void (µl) for metabolic cage study; and voiding volume per micturition (VV, µl), volume threshold for inducing micturition (VT, µl), voiding efficiency (VE, %), and maximal voiding pressure (MVP, mmHg) for CMG study. All values are expressed as mean ± S.E.M. Statistical analyses were made using Mann-Whitney test and $p < 0.05$ was considered significant (*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$).

RESULTS

Analysis of voluntary voiding behavior in the metabolic cage (Fig. 1):

Water intake, urine output, number of voiding, and urine volume/void were evaluated per 24 h, per 12 h in the dark period, and per 12 h in the light period. In females, KO mice presented greater urine volume/void and smaller number of voiding than WT mice. However, no differences in water intake and urine output were found between KO and WT. Meanwhile, in males, no differences were found in any variables evaluated in the study.

Evaluation of reflex activity of the lower urinary tract during CMG (Table 1):

Female KO mice showed larger VV (89.5%) and VT (92.2%), and lower VE (3.5%), compared with female WT mice. Meanwhile, male KO mice presented larger VT (36.2%) and lower VE (4.0%) compared with male WT mice, but no difference in VV.

INTERPRETATION OF RESULTS

The dual analysis implied that the neural pathway via mGluR1 is involved in excitatory afferent signal transmission from the bladder. FVC revealed significant differences between KO and WT in urine volume/void and urinary frequency in females, but not in males. Likewise, CMG showed significant difference between KO and WT in VV in females but not in males, although it revealed differences between the two groups in other evaluated variables (i.e., VT, VE, MVP) in both males and females. Overall, however, the differences in variables during storage phase between KO and WT are more markedly presented in females than in males. Higher MVP in KO, compared with that in WT, is common in both males and females and can be due to greater bladder contractility, higher urethral resistance, or both.

CONCLUDING MESSAGE

This study showed that the mGluR1 phenotype during storage phase in lower urinary tract function (i.e., facilitatory control of afferent neural transmission) is more prominent in the female, compared with the male. Thus, it is important to take the sex difference into account when designing study, conducting experiments and interpreting results.

FIGURE 1

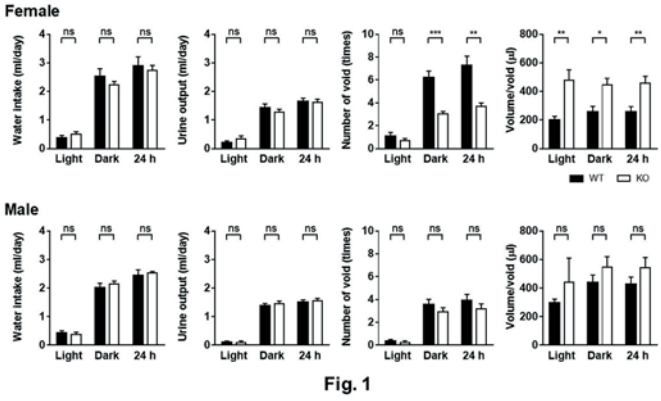

Fig. 1

FIGURE 2

Table 1

Female	VV (µl)	VT (µl)	VE (%)	MVP (mmHg)
WT	163 ± 13	167 ± 12	97.2 ± 0.6	27 ± 1
KO	308 ± 57***	328 ± 59***	93.8 ± 1.3*	32 ± 1*
Male	VV (µl)	VT (µl)	VE (%)	MVP (mmHg)
WT	147 ± 9	150 ± 9	97.4 ± 0.4	23 ± 1
KO	192 ± 19	205 ± 18*	93.5 ± 1.7*	29 ± 1**

REFERENCES

1. Yoshiyama M, et al. International Continence Society 45th Annual meeting, Abstract No. 59 (2015)
2. Guarneri L, et al. BJU Int 102: 890-898 (2008)
3. Yoshiyama M, et al. Am J Physiol Renal Physiol 308: F1128-F1134 (2015)

Funding Japan Society for the Promotion of Science (KAKENHI) Grant No. 16K11042 **Clinical Trial** No **Subjects** Animal **Species** Mouse **Ethics Committee** Institutional Animal Care and Use Committee of the University of Yamanashi

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SUPRASPINAL LOWER URINARY TRACT CONTROL IN SPINAL CORD INJURY PATIENTS UNDERGOING INTRADETRUSOR ONABOTULINUMTOXINA INJECTIONS: AN MRI STUDY

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HYPOTHESIS / AIMS OF STUDY

In patients with spinal cord injury (SCI), intradetrusor onabotulinumtoxinA injections is a standard treatment for refractory neurogenic detrusor overactivity (NDO). However, treatment effects on supraspinal lower urinary tract control (LUT) are poorly understood.

Therefore, the aim of this study was to elucidate supraspinal LUT control and effects of intradetrusor onabotulinumtoxinA injections in SCI patients.

STUDY DESIGN, MATERIALS AND METHODS

In a structural and functional magnetic resonance imaging (MRI) study, we prospectively assessed SCI patients (n=23, mean age 40±12 yrs.) with refractory NDO due to a complete (n=15) or incomplete lesion (n=8). All patients underwent urodynamic evaluation (UDI) and MRI measurements prior and 5-8 weeks after intradetrusor onabotulinumtoxinA injections. MRI measurements consisted of tensor based morphometry (TBM) and functional MRI (fMRI) using 3 different bladder stimulation tasks: repetitive bladder filling of 100mL body warm and cold (4°C) saline, starting with an empty or prefilled bladder (block design). Patients repetitively rated their desire to void during bladder stimulation tasks.

RESULTS

UDI revealed a significant increase in maximum cystometric capacity and decrease in maximum detrusor pressure after treatment ($p \leq 0.005$).

For evaluation of the MRI measurement, one SCI patient had to be excluded due to head motions during data acquisition.

Desir to void during bladder stimulation task significantly decreased after treatment ($p \leq 0.002$).

TBM elucidated a significant ($p=0.05$, familywise error-corrected (FWE)) volume decrease in the bilateral orbitofrontal cortex after treatment.

Comparing fMRI measurements pre- vs. posttreatment, one sample t-test showed significant ($p=0.05$, FWE) supraspinal blood oxygenation level dependent (BOLD) signal changes in areas known to be involved in LUT control at both time points. Paired t-test revealed more activation ($p=0.001$ uncorrected) in the bilateral frontal operculum, triangle, prefrontal and orbitofrontal cortex, the cingulate cortex, the periaqueductal gray, the basal ganglia, the secondary motor as well as the secondary sensory areas pre- vs. posttreatment.

No correlation between lesion level or completeness of the lesion and BOLD signal intensity could be found.

INTERPRETATION OF RESULTS

SCI patients showed significant supraspinal activation in areas known to be involved in LUT control during bladder stimulation tasks. Intradetrusor onabotulinumtoxinA treatment resulted in supraspinal structural changes and BOLD signal decrease.

CONCLUDING MESSAGE

These findings imply that extra-spinal pathways are involved in LUT control overtaking sensory functions and underlay afferent effects of onabotulinumtoxinA treatment.

Funding Swiss National Science Foundation **Clinical Trial** Yes **Registration Number** https://clinicaltrials.gov/ct2/show/NCT01768910 **RCT** No **Subjects** Human **Ethics Committee** Kantonale Ethikkommission Zürich **Helsinki** Yes **Informed Consent** Yes

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PATTERN OF INNERVATION AND REINNERVATION OF THE PERIURETHRAL STRIATED MUSCLE OF THE MALE RAT

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HYPOTHESIS / AIMS OF STUDY

The male urethra performs urinary and reproductive functions. In contrast to other pelvic viscera, normal urethral functions require the activation of striated musculature. In rats, the external urethral sphincter (EUS) is a complex musculature with circular and oblique fibers that surround the prostatic and membranous urethra, and contribute to maintaining urinary continence and prevent retrograde ejaculation. The ischiocavernosus (IC) muscles are localized lateral to the base of the penis, and their contraction have been related to the control of penile erection. Both, EUS and IC muscles present evoked response to urethral stimulation [1]. Anatomically, the EUS do not present clear division between left and right muscles, however, the innervation is bilateral and arises from two, left and right, motor branches of the sacral plexus (MBSP) [2]. This pattern of innervation suggest the possibility of ipsilateral and contralateral innervation. The aim of the present study was to determine the pattern of innervation of the EUS and IC fibers as well as its reinnervation after unilateral surgical nerve injury.

STUDY DESIGN, MATERIALS AND METHODS

The experimental protocol was approved by the University Committee on Laboratory Animals, according to the guidelines of the Mexican Council on Laboratory Animals Care (NOM-062-ZOO-1999) and NIH Guide for the Care and Use of Laboratory Animals. We employed adult Wistar male rats (250–300 g). The animals were randomized to undergo IC and EUS electromyography (EMG) before and 30 min after unilateral axotomy of the MBSP (Experiment 1, n=6), or after two, three, five and 20 weeks after the axotomy (Experiment 2, n=6 per group). In the Experiment 1 the animals were anesthetized with urethane (1.2 g/kg) and a laparotomy was performed to localize the IC and EUS muscles. Bipolar stainless steel electrodes (0.05 mm) were placed in the left and right sides of the EUS and IC muscles, and connected to an electrophysiological recorded system. Periurethral muscles EMG activity was evoked by mechanostimulation of the penile urethra using a catheter with a 0.8 mm in diameter. The catheter was introduced through the urinary meatus to the diverticulum (bulbar urethra). EMGs were simultaneously recorded before, during and after urethral stimulation in intact condition and after the axotomy of the right MBSP. In the Experiment 2 the animals were anesthetized with ketamine (60 mg/kg) and xylazine (7.5 mg/kg) and the right MBSP was localized at the level of the ischiorectal fossa and transected (5 mm of nerve was removed). The animals were anesthetized (urethane 1.2g/kg) two, three, five and twenty weeks after surgery and EMGs recorded as described above. The pattern of the EMG of periurethral muscles was characterized and one second sample during mechanical stimulation was analyzed to determine mean amplitude (μV) and frequency (Hz). Statistical analysis was performed using Sigma Plot Software (version 12, Systat Software, Inc.). Paired Student´s t-test (Experiment 1) or ANOVA (Experiment 2) were used to analyze the data. P values of <0.05 indicated a statistically significant differences for statistical comparisons.

RESULTS

In Experiment 1, both sides of the EUS discharged synchronically during stimulation of penile urethra and diverticulum. The EMG activity was characterized by tonic activity (amplitude, 140 ± 21 μV; frequency, 201 ± 8 Hz) and a long afterdischarge (~10 sec). Left and right IC muscles only discharged during stimulation of the diverticulum. EMG responses were in burst (amplitude, 78 ± 12 μV; frequency, 120 ± 34 Hz) and rarely presented afterdischarge (1-2 sec). Right MBSP axotomy reduced the amplitude of the ipsilateral to the transected nerve EUS reflex response to 35% and eliminated the response of the right IC, but did not affect neither the frequency nor amplitude of the left IC and EUS fibers (intact side) ($p>0.05$). In the Experiment 2, the EUS and IC responses to urethral stimulation recovered gradually across time, and three and five weeks after the axotomy no statistical differences were observed neither in amplitude nor frequency between the denervated side versus the non denervated side ($p>0.05$). However, after 20 weeks of axotomy the IC EMG response of the ipsilateral side to the sectioned MBSP was exacerbated and the EMG amplitude was larger than the value of the non-denervated side ($p<0.05$). In addition, the pattern of the IC muscle discharge in response to the urethral stimulation was atypical responding with tonic long after-discharges, a characteristic pattern of the EUS.

INTERPRETATION OF RESULTS

The present findings show that the pattern of discharge of the EUS differs from the IC response, which indicates that motoneurons innervating each periurethral muscle have differential electrophysiological properties. It despite IC and EUS motoneurons are hosted in the same spinal nucleus, the dorsolateral nucleus of the lumbosacral spinal cord. The fact that the EUS responded to mechanostimulation of the penile and bulbar urethra but the IC muscles only to the diverticulum indicates that regional urethral afferents converge on IC and EUS motoneurons and may explain the fact that IC muscles discharge during micturition [3], even though its contraction seems no to be crucial for the control of micturition in male rats. Our data also demonstrate that while the

EUS fibers have 35% of contralateral innervation, IC muscles of male rats are only innervated by the ipsilateral MBSP. However, after unilateral denervation both muscles seems to be reinnervated by contralateral fibers of the MBSP. The denervated fibers of the EUS get reinnervation probably through the sprouting of the contiguous contralateral nerve fibers, which allow a correct function. In contrast, the denervated IC muscle gets aberrant innervation, which may affect IC function, such as penile erection. The non-specific reinnervation seems to arise from an extension of the EUS motor-units from contiguous muscle. Nerve lesion is common during pelvic surgeries, such as prostatectomies, and for this reason is important to clarify the regenerative mechanisms and reinnervation of striated muscles of the genitourinary tract, in order to develop innovative techniques to facilitate functional reinnervation of these structures.

CONCLUDING MESSAGE

Periurethral striated muscles are innervated by motoneuron pools with different electrophysiological properties. After unilateral nerve lesion, functional contralateral reinnervation appears for contiguous fibers, however, aberrant reinnervation may occur for not contiguous musculature. Further studies are necessary to facilitate specific reinnervation of bilateral, non-contiguous muscles of the lower urinary tract.

REFERENCES

1. Juarez, R., et al., Activity of the external urethral sphincter evoked by genital stimulation in male rats. Neurourology and Urodynamics, 2016. 35(8): p. 914-919.
2. Juarez, R. and Y. Cruz, Urinary and ejaculatory dysfunction induced by denervation of specific striated muscles anatomically related to the urethra in male rats. Neurourology and Urodynamics, 2014. 33(4): p. 437-42.
3. Cruz, Y. and JW. Downie, Sexually dimorphic micturition in rats: relationship of perineal muscle activity to voiding pattern. American Journal of Physiology Regulatory, Integrative and Comparative Physiology, 2005. 289(5): R1307-18.

Funding CONACYT: YCG-183446, JAH-592590, NMA-591688, DZL-780079, JPG-488223 **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** Centro Tlaxcala de Biología de la Conducta bioethical committee

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BLADDER DYSFUNCTION TREATMENT IN AN ANIMAL MODEL OF MULTIPLE SCLEROSIS

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HYPOTHESIS / AIMS OF STUDY

Multiple sclerosis (MS) is the most prevalent neurological disorder in young people. Among the most incapacitating symptoms, urinary incontinence due to neurogenic detrusor overactivity is reported by the majority of patients. The transient receptor potential vanilloid 1 (TRPV1) is a receptor described to have an important role in bladder dysfunction, particularly if associated with NDO. TRPV1 desensitization with agonists, such as resiniferatoxin (RTX), has been shown to improve bladder function in various animal models. In the context of MS, a recent study showed that TRPV1 knockout mice were protected from disease progressions, presenting delayed disease onset, myelin preservation and reduced clinical scores [1]. Here, we investigated if MS-induced bladder dysfunction can be attenuated by TRPV1 desensitization with RTX in Experimental Auto-immune Encephalitis (EAE).

STUDY DESIGN, MATERIALS AND METHODS

In this study, female Wistar rats were used and EAE was induced by a single injection in the flank of 100µl of an emulsion containing myelin basic protein (MBP) and Complete Freund's Adjuvant (CFA) [2]. Cyclosporin A (Cyc) was subcutaneous injected 3 times a week until the end of the experimental time (6 weeks). Animals were monitored daily and the thermal and mechanical sensitivity were evaluated to follow the disease progression. Four weeks after disease induction, received 100µl of intrathecal RTX 0,1µg/kg or its vehicle (10% ethanol in sterile saline). In the following week, animals were again submitted to behavioural testing to determine cutaneous sensitivity. At the end of the experimental period, rats received subcutaneous urethane (1.2 g/Kg) and underwent 1-hour cystometry. At the end, the lumbosacral spinal cord, associated dorsal root ganglia (DRG) and the sciatic nerve were collected and processed for immunohistochemical analysis. the markers analysed included MBP, TRPV1, calcitonin gene-related peptide (CGRP), isolectin-IB4 (IB4) binding, Iba-1 and Glial fibrillary protein (GFAP).

RESULTS

EAE animals developed fluctuating heightened sensitivity to mechanical and hot stimuli during disease progression and presented increased frequency of bladder reflex contractions, accompanied by a decrease in the bladder amplitude of contractions. Intrathecal administration of RTX, but not vehicle, improved cutaneous sensitivity to mechanical

stimulation and bladder function, with a reduction of the frequency of bladder contractions.

Tissue analysis showed reduced spinal but not peripheral MBP expression, when compared with tissue obtained from non-manipulated animals. Spinal CGRP was not altered by EAE but TRPV1 expression and IB4 binding were reduced. Labelling intensity of Iba-1 and GFAP marker was elevated in EAE rats in comparison with non-manipulated rats. While intrathecal vehicle did not change the spinal expression of those markers, a reduction of the labelling intensity of TRPV1, CGRP and IB4 was found following intrathecal RTX. Likewise, intrathecal RTX also lead to a decrease in the immunostaining intensity of Iba-1 and GFAP.

In the DRG of intact animals we observed a high intensity TRPV1 and CGRP labelling in small-to-medium sized cell bodies (20-180 µm2 area) In EAE animals, TRPV1 and CGRP labelling was also found in larger cell bodies (120-600 µm2). No differences in labeling intensity were found in IB4-binding. After intrathecal RTX, but not vehicle, we found a decrease in the number of cell bodies labelled with CGRP, TRPV1 and IB4.

INTERPRETATION OF RESULTS

Results show that EAE animals developed pain, reflected by increased mechanical and thermal sensitivity that fluctuated during the experimental period and is suggestive of a relapsing and remitting form of disease. EAE animals also developed bladder dysfunction, characterized by high frequency and low amplitude of bladder reflex contractions. This was accompanied by demyelination restricted to the spinal cord, glial activation, as well as a reduction in the expression of the peripheral markers, TRPV1 and IB4 binding. Intrathecal RTX injection, and consequent central TRPV1 desensitization [3] improved pain levels and bladder reflex activity. Altogether, results suggest EAE-induced pain and bladder dysfunction reflect changes in glial activation at the spinal cord level as well as impairment of the central processes of peripheral afferents conveying sensory input to the superficial laminae of the cord.

CONCLUDING MESSAGE

The present study described the emergence of changes in bladder function in an EAE animal model, indicatives of neurogenic detrusor overactivity (NDO). As intrathecal RTX improved bladder dysfunction, it is likely that TRPV1 is an important player in MS pathophysiology and may constitute an attractive therapeutic target to alleviate symptoms.

REFERENCES

1. Paltser G, Liu XJ, Yantha J, et al. TRPV1 gates tissue access and sustains pathogenicity in autoimmune encephalitis. Mol Med. 2013: 19:149-59
2. Thibault K, Calvino B, Pezet S. Characterisation of sensory abnormalities observed in an animal model of multiple sclerosis: a behavioural and pharmacological study. Eur J Pain. 2011 Mar: 15:231 e1-16
3. Cruz CD, Charrua A, Vieira E, Valente J, Avelino A, Cruz F. Intrathecal delivery of resiniferatoxin (RTX) reduces detrusor overactivity and spinal expression of TRPV1 in spinal cord injured animals. Exp Neurol. 2008 Dec: 214:301-8

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ALTERED O-GLCNACYLATION IMPAIRS NEUROTRANSMISSION IN DIABETIC BLADDERS

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HYPOTHESIS / AIMS OF STUDY

O-GlcNAcylation is a post-translational protein modification of serine/threonine residues by N-acetyl-glucosamine (O-GlcNAc) that can negatively regulate the phosphorylation/activation of a variety of proteins, and thus alter important cellular processes. For example, neurotransmitter release is thought to be regulated by O-GlcNAcylation of synaptic proteins. With diabetes, elevated glucose levels increase the extent of O-GlcNAcylation of key proteins in the insulin signaling pathway, thus impeding their functions; however, whether chronic hyperglycemia alters the O-GlcNAcylation of key proteins involved in bladder neurotransmission has not been previously investigated. Using an animal model of type 2 diabetes (T2D), this study examined the effect of hyperglycemia on the O-GlcNAcylation patterns of bladder proteins and investigated whether aberrant changes in O-GlcNAcylation of specific proteins involved in synaptic vesicle trafficking parallel the age-dependent changes in detrusor neurotransmission in T2D.

STUDY DESIGN, MATERIALS AND METHODS

Urinary bladders were procured from 10, 20, 30, 40-week-old db/db mice, an animal model of T2D due to genetic deletion of leptin receptor. Bladders from age-matched C57BLKS/J were used as controls. Changes in protein O-GlcNAcylation were investigated by western blotting (WB) in db/db and control bladder tissues at each age. Protein co-localization and interaction in bladder tissue was investigated by multiplex WB and co-immunoprecipitation analysis respectively. For functional studies, longitudinal bladder smooth muscle tissue without mucosa was suspended in organ bath containing oxygenated Kreb's at 37°C and stretched to 0.5 grams for isometric tension experiments. Detrusor responses to nerve or agonist induced stimulations were compared between diabetic and control animals at each age.

RESULTS

Blood glucose levels in db/db mice were significantly higher than those in control animals from 10 to 40 weeks of age. In db/db mice, proteins from whole bladder lysates were significantly more O-GlcNAcylated as early as 10 weeks of age

compared to proteins from control bladders. A particularly hyper O-GlcNAcylated protein band was colocalized with immunoreactivity for Akt, a protein kinase that is involved in the regulation of synaptic vesicle trafficking in neurons. Bladder contractions induced by nerve stimulation were significantly lower in db/db mice than in control from 10 to 40 weeks of age. In contrast, no differences between db/db and control mice were detected in post-junctional bladder contractions elicited by agonists. Immunoreactivity for myosin 5a (MYO5a), a motor protein involved in synaptic vesicles translocation within varicosities of peripheral nerves, was detected in Akt immuno-precipitates, as well as in immuno-precipitates obtained with an antibody that recognizes Akt-dependent phosphorylated substrates.

INTERPRETATION OF RESULTS

The increased levels of O-GlcNAcylated proteins found in diabetic bladders is consistent with other tissues in which chronic hyperglycemia causes elevated protein O-GlcNAcylation. The augmented O-GlcNAcylation of Akt in diabetic bladders together with the decreased neurogenic detrusor contractions in db/db mice suggest that altered regulation of Akt induced by hyperglycemia impairs nerve-mediated responses. Moreover, the molecular interaction between Akt and MYO5a suggests a role for Akt in phosphorylating/activating Myo5a in peripheral nerves to achieve neurotransmission.

CONCLUDING MESSAGE

Under conditions of chronic hyperglycemia, increased O-GlcNAcylation may cause impaired neurotransmission in diabetic bladders by altering the activation of Akt-dependent motor proteins involved in synaptic vesicle trafficking, and thus reducing neurotransmitter release.

Funding Medical Research Service, Department of Veterans Affairs, Washington D.C. **Clinical Trial** No **Subjects** Animal **Species** MOUSE **Ethics Committee** VA BHS IACUC

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TIME COURSE OF URODYNAMIC FUNCTION AND THE EXPRESSION OF BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF) IN MICE WITH SPINAL CORD INJURY

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HYPOTHESIS / AIMS OF STUDY

BDNF is reportedly involved in changes in neural pathways to induce lower urinary tract (LUT) dysfunction such as detrusor overactivity (DO) and inefficient voiding due to detrusor-sphincter dyssynergia (DSD) following spinal cord injury (SCI). We recently reported that the neutralization of BDNF for 28-day SCI mice improved the voiding efficiency in association with increased synergistic activity of external urethral sphincter during voiding, although it did not influence the non-voiding contraction (NVC) (2017 ICS). However, it has not been well clarified how BDNF affect storage and voiding functions after SCI. Therefore, we investigated the time course of urodynamic function and the expression of BDNF in mice after SCI.

STUDY DESIGN, MATERIALS AND METHODS

SCI was produced by complete transection of the Th8/9 spinal cord in female C57BL/6N mice. After spinal transection, their bladder was manually squeezed to eliminate the urine once daily until the evaluation. We evaluated the bladder function and bladder BDNF concentration of spinal intact normal mice and SCI mice at 5-day (only BDNF assay), 10-day, 20-day, and 30-day after the injury. Each mouse was evaluated using single-filling cystometry under an awake condition. After the urodynamic evaluation, the bladder was removed and separated into bladder mucosa and muscle layers to measure BDNF levels by the ELISA method and to compare with those of spinal intact mice.

RESULTS

Compared to spinal intact mice, the number of NVC per void and threshold pressure was gradually and significantly increased with time after SCI. The number of NVC of 30-day SCI mice was significantly larger than that of 10-day SCI mice. The voiding pressure among any SCI groups was similar and significantly larger than that of spinal intact mice. The voided volume of 10-day SCI mice was smaller than that of spinal intact mice, 20-day and 30-day SCI mice. Post-void residual (PVR) and bladder capacity were larger in three SCI groups of mice than those of spinal intact mice, and these were larger in 20- and 30-day SCI mice than those of 10-day SCI mice. Voiding efficiency among any SCI groups was similar and significantly smaller than that of spinal intact mice (Figure 1: Urodynamic results).

BDNF in the bladder mucosa of any SCI groups was higher than that of spinal intact mice, but BDNF in the bladder muscle was similar between SCI and spinal intact mice. Bladder mucosal BDNF was at the maximum level at 5-day after SCI (Figure 2: Bladder BDNF concentration).

INTERPRETATION OF RESULTS

In this study, bladder mucosal BDNF reached its maximal expression levels at 5-day during the 30-day period after SCI, indicating that bladder BDNF expression is elevated in the early phase after SCI. The voided volume was small only at 10-day after SCI. As the time goes on, bladder capacity and PVR were becoming larger with making the voiding efficiency worse. Combined with our previous research, increased BDNF has a significant role in the voiding dysfunction such as dyssynergistic activity of external urethral sphincter from the early phase through the late phase after SCI. The incidence of NVC was gradually increased, and at 30-day after SCI, the number of NVC was larger than that of 10-day SCI mice, suggesting that bladder BDNF does not influence directly on the emergence of NVC because the bladder BDNF

concentration was lower at 30-day than at 5-day or 10-day of SCI. The urodynamic changes by the early inhibition of BDNF will provide further insights into the role of BDNF in SCI-induced LUT dysfunction in future.

CONCLUDING MESSAGE

The early elevation of bladder mucosal BDNF after SCI induces the voiding dysfunction including a small voided volume and poor voiding efficiency. However, the bladder BDNF level may not influence the emergence of NVC, directly.

FIGURE 1

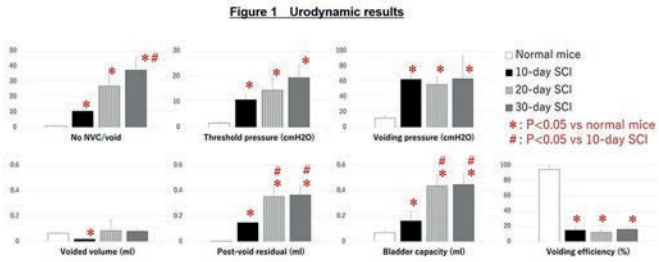
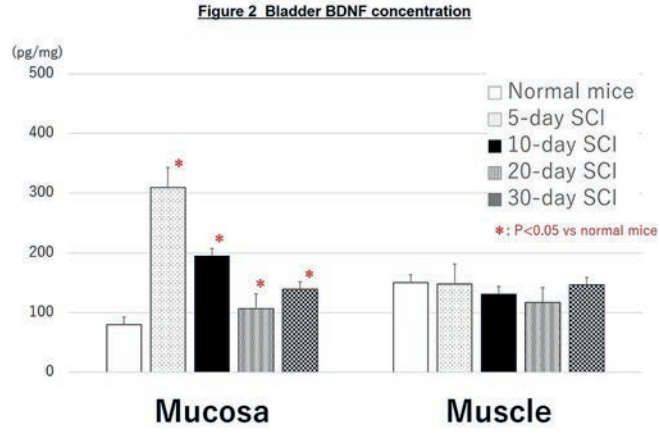


FIGURE 2



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SURGICAL TREATMENTS FOR WOMEN WITH STRESS URINARY INCONTINENCE: A NETWORK META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS

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HYPOTHESIS / AIMS OF STUDY

There have been many randomised controlled trials (RCTs) to compare surgical interventions for the treatment of women with stress urinary incontinence (SUI). Eight Cochrane systematic reviews of RCTs have evaluated nine surgical options available to treat SUI. The evidence from these reviews has been of limited usefulness due to a focus on discrete two-way comparisons, making it difficult for women and clinicians to judge which treatment is best overall. The aim of this study was to draw together all relevant evidence and conduct a network meta-analysis to compare the available surgical treatments with each other.

STUDY DESIGN, MATERIALS AND METHODS

We systematically reviewed nine surgical interventions for women with SUI: open and laparoscopic colposuspensions, traditional suburethral slings, retropubic and transobturator mid-urethral slings (MUS), single incision slings, anterior vaginal repair, bladder neck needle suspension and periurethral bulking agents. A valid comparator was one of the included interventions. We identified relevant RCTs from the existing Cochrane systematic reviews and updated literature searches using the Cochrane Incontinence Group Specialised Trials Register, which contains trials identified from the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, MEDLINE In-Process, MEDLINE Epub Ahead of Print, ClinicalTrials.gov, WHO ICTRP and handsearching of journals and conference proceedings (searched May 2017). Primary outcomes were cure rate and improvement rate at 12 months, analysed by means of a network-meta analysis (NMA), with results presented as odds ratio (OR) and 95% credible intervals (CrI), and the surface under the cumulative ranking curves (SUCRA) to summarise treatment ranking. Adverse events were compared using pair-wise meta-analyses. Risk of bias was assessed using the Cochrane risk-of-bias tool. Quality of evidence for NMA was assessed using the GRADE approach.

RESULTS
The review included 153 trials identified from 8 Cochrane reviews and 31 new trials. There were 21,598 women included in total. Studies were generally of small sample size (ranging from 15 to 655 participants, with a median of 91 participants per study) and short follow-up (ranging from 1 to 126 months, with a median of 12 months). Blinding of practitioners and/or patients to treatment allocation was not always possible due to the nature of intervention (surgery) and the risk of bias in most other domains was generally unclear.

There were 105 trials with usable data for cure and 120 trials for improvement for NMA. Results indicated that, on average, women who had traditional sling and retropubic MUS were more likely to experience cure of incontinence symptoms compared with those who had other surgical procedures (e.g., compared with retropubic MUS, OR for traditional sling 1.06, 95% CrI 0.62 to 1.85 [quality of evidence: very low]; OR for open colposuspension 0.85, 95% CrI 0.54 to 1.33 [quality of evidence: very low]; OR for transobturator MUS 0.74, 95% CrI 0.59 to 0.92 [quality of evidence: moderate]). Women were also more likely to experience an improvement in their incontinence symptoms after receiving retropubic MUS or transobturator MUS compared with other surgical procedures (e.g., compared with retropubic MUS, OR for transobturator MUS 0.76, 95% CrI 0.59 to 0.98 [quality of evidence: moderate]; OR for traditional sling 0.69, 95% CrI 0.39 to 1.26 [quality of evidence: low]; OR for open colposuspension 0.65, CrI 0.41 to 1.02 [quality of evidence: low].

SUCRA showed that traditional sling and retropubic MUS had an average probability of 89.4% and 89.1%, respectively, of resulting in higher cure rates than other surgical procedures. Retropubic MUS and transobturator MUS had a probability of 97% and 76.1%, respectively, of resulting in the highest improvement rates.

Limited data were available for the assessment of complications. Numbers of events included in the analyses were generally small and, therefore, confidence intervals wide. This was mainly due to lack of available data but also inconsistent reporting across individual trials and across Cochrane systematic reviews in terms of the type and definition of complications as well as the time points at which these were measured. Crucially, long-term data on adverse events were lacking. In general, rate of tape and mesh exposure was higher after transobturator MUS than after retropubic MUS or single incision sling, while the rate of tape or mesh erosion or extrusion was similar between transobturator MUS and retropubic MUS. Retropubic MUS had a higher rate of major vascular complications, voiding difficulties, and bladder or urethral perforation than transobturator MUS but a lower rate of groin pain. Rate of post-operative pain was higher after retropubic than single incision sling.

INTERPRETATION OF RESULTS
Traditional slings and retropubic MUS were the most likely treatments to cure symptoms of SUI, while retropubic and transobturator MUS were most likely to improve SUI symptoms, compared with other available surgical procedures. However, some comparisons had a limited number of studies and there is considerable uncertainty around the estimates of effect. Quality of evidence was downgraded mainly for risk of bias and imprecision.

CONCLUDING MESSAGE
We found that retropubic MUS, transobturator MUS and traditional slings appear to be more effective in resolving or reducing SUI symptoms compared with the other included interventions. Crucially, there is a lack of data on the long-term outcomes, particularly long-term complications which were rarely adequately reported. Further research to reduce uncertainty around long-term outcomes of all relevant surgical treatments would be needed to better inform decision making.

Funding NIHR HTA Programme (project number 15/09/06) **Clinical Trial** No **Subjects** Human **Ethics not Req'd** It is secondary research (systematic review) and only used data from published studies **Helsinki** Yes **Informed Consent** No

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NOVEL EXTERNAL ELECTRICAL MUSCLE STIMULATION DEVICE FOR THE TREATMENT OF FEMALE STRESS URINARY INCONTINENCE: RANDOMIZED CONTROLLED TRIAL VERSUS INTRAVAGINAL ELECTRICAL MUSCLE STIMULATION

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HYPOTHESIS / AIMS OF STUDY
Most electrical muscle stimulation devices for the treatment of stress urinary incontinence use transvaginal electrical stimulation. The Vital Compact is a novel, non-invasive, external electrical muscle stimulation device for the treatment of incontinence. It comprises a portable, handheld, battery-powered controller connected to a 2-part wrap-around garment which holds hydrogel adhesive skin-contact electrodes in place on the buttocks and thighs. The aim of this study was to compare the efficacy and safety of the Vital Compact external electrical muscle stimulation device with an FDA-cleared intravaginal device (itouch sure) for the treatment of stress urinary incontinence in women.

STUDY DESIGN, MATERIALS AND METHODS
This was a prospective, randomized, single-blind, multicenter, noninferiority study performed at 12 sites in the USA. Women with stress urinary incontinence whose condition had not improved using pelvic floor muscle training (Kegel exercises) were randomized to undergo treatment with either the Vital Compact or itouch sure device for 12 weeks. Treatment was administered by the subjects at home using

the device in accordance with the relevant instructions for use, which specified that the Vital Compact device was used for 30 minutes once daily for 5 days/week, and the itouch sure device was used for 20 minutes once daily every day.

The primary endpoint was the proportion of subjects who achieved "significant improvement" (>50% reduction in pad weight from baseline) in the provocative pad weight test at 12 weeks. Key secondary efficacy endpoints included the mean change from baseline to week 12 for urine leakage in the provocative pad weight test and the 24-hour pad weight test, number of incontinence episodes/day, Incontinence Quality of Life questionnaire (I-QOL) score, number of pads used/day, and the proportion of patients achieving dryness (<1 g on the provocative pad weight test) at week 12. These endpoints were to be analysed in hierarchical fashion, provided the primary endpoint was met. Safety and tolerability were also assessed. The study sample size was 180 patients: assuming a success rate of 52% for the itouch sure [1] and 71% for the Vital Compact, 87 subjects/group provided 90% power using a one-sided type I error rate of 0.025 and a noninferiority margin of 5%.

RESULTS

Between April 2015 and April 2017, 89 women were randomized into the Vital Compact group and 91 to the itouch sure group. Baseline incontinence characteristics were similar between the groups (table).

At week 12 a "significant improvement" in the provocative pad weight test was seen in most subjects in both the Vital Compact group (56.3%) and the itouch sure group (63.0%), although noninferiority was not established because the lower bound of the 95% confidence interval for the treatment difference did not exceed the -5% noninferiority margin (difference 6.7%, 95% CI 21.7% to 8.4%). Nonetheless, statistically significant improvements from baseline in mean urine leakage in the provocative pad weight test and 24-hour pad weight test, number of incontinence episodes and pads used per day, and I-QOL score were seen with both devices at week 12 (table). In accordance with the prespecified hierarchical statistical analysis plan between-group differences were not tested statistically, but there were no clinically significant differences in the level of improvement seen in the two groups. At week 12, 87.2% of the Vital Compact group and 86.8% of the itouch sure group were in the dry or mild categories of stress incontinence severity, compared to 54.5% and 60.7% at baseline (all of which had been in the mild category), representing an improvement of 32.7% for Vital Compact and 26.1% for itouch sure.

A higher proportion of the Vital Compact group than the itouch sure group used the device for ≥75% of target use (81.6% versus 67.0%) and mean±SD percent target use was higher in the Vital Compact group (86.25±28.75%) than in the itouch sure group (76.50±25.029%). Adverse events were predominantly mild or moderate. No serious device-related adverse events occurred. Few subjects discontinued the study due to adverse events (Vital Compact 3.4%, itouch sure 4.4%) and only 2 subjects, both in the Vital Compact group, discontinued due to device-related adverse events (device discomfort, skin irritation). The most common device-related adverse event with the Vital Compact was device discomfort (9.0%); in most cases this was managed by modifying the stimulation intensity. The most common device-related adverse events in the itouch sure group were urinary tract/vaginal infections (7.7%); no infections occurred in the Vital Compact group.

INTERPRETATION OF RESULTS

The two devices provided broadly similar, clinically meaningful, improvements in a range of subjective and objective measures of stress urinary incontinence. Noninferiority versus the itouch sure was not established for the primary endpoint, possibly in part because of underpowering. Both devices were well tolerated. The Vital Compact was associated with fewer infections than the itouch sure. Compliance with treatment appeared to be better with the Vital Compact

CONCLUDING MESSAGE

The Vital Compact is a novel, noninvasive, and safe external electrical muscle stimulation device for the treatment of female stress urinary incontinence.

FIGURE 1

Table: key secondary endpoints

Parameter		Vital Compact (N=89)	itouch sure (N=91)
Provocative pad weight test - urine leakage	Baseline Change from baseline: week 12	24.33 (20.063) -8.48 (25.053)*	23.21 (20.448) -9.66 (22.876)***
24-hour pad weight test - urine leakage	Baseline Change from baseline: week 12	26.37 (32.204) -13.07 (21.531)***	24.74 (28.869) -9.89 (19.989)***
Incontinence episodes/day	Baseline Change from baseline: week 12	2.98 (2.341) -1.24 (1.564)***	2.93 (4.987) -1.43 (4.120)***
Incontinence Quality of Life questionnaire (total score)	Baseline Change from baseline: week 12	58.55 (19.798) 13.42 (16.463)***	59.47 (19.464) 15.42 (18.376)***
Pads used/day	Baseline Change from baseline: week 12	2.05 (1.417) -0.30 (0.998)**	1.96 (1.232) -0.44 (0.984)***
Dryness (<1g leakage on provocative pad weight test)	Baseline, n (%) Week 12, n (%)	0 (0) 17 (19.1)	0 (0) 29 (31.9)

Data are mean (standard deviation) unless indicated otherwise. * p=0.002, ** p=0.006, *** p≤0.001 vs baseline.

REFERENCES

1. Sand PK, Richardson DA, Staskin DR, Swift SE, Appell RA, Whitmore KE, Ostergard DR. Pelvic floor electrical stimulation in the treatment of genuine stress incontinence: a multicenter, placebo-controlled trial. Am J Obstet Gynecol. 1995 Jul;173(1):72-9.

Funding None **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov NCT02423005 **RCT** Yes **Subjects** Human **Ethics Committee** Approval for the study was obtained from the relevant Institutional Review Boards or Western IRB **Helsinki** Yes **Informed Consent** Yes

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22-YEAR POPULATION-LEVEL TRENDS IN THE SURGICAL MANAGEMENT OF FEMALE STRESS URINARY INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

Since 1999 transvaginal sling (TVS) procedures have been an effective treatment for Canadian women with stress urinary incontinence (SUI). However, complications associated with transvaginal mesh led to warnings from the U.S. Food and Drug Administration (FDA) and Health Canada in 2008 and 2010, respectively. We hypothesized that these warnings would significantly decrease the utilization of TVS procedures for SUI. Therefore, we sought to characterize trends in the surgical management of SUI in a single-payer healthcare system in Ontario, Canada over a 22-year period.

STUDY DESIGN, MATERIALS AND METHODS

We performed an interrupted time-series analysis using segmented regression among women aged 18 years and older undergoing surgical treatment for SUI between January 1, 1994 and December 31, 2016 in Ontario, Canada. The passage of time was considered the primary exposure. The outcome was the annual population-adjusted rates of SUI surgery over time stratified by modality: urethropexy, TVS, abdominal/vaginal sling and transurethral bulking agents.

RESULTS

We identified 120 999 women who underwent SUI surgery between 1994 and 2016. The total number of SUI procedures did not significantly change between 1994-2000 (mean 95 per 100 000 population, p=0.89). From 2000-2009, the total number of SUI procedures significantly increased (95 to 147 per 100 000 population, p<0.001) driven by a significant increase in TVS procedures (19 to 129 per 100 000 population, p<0.001). During this time period, the number of urethropexy, abdominal/vaginal sling and bulking agent procedures significantly decreased (p<0.001). After 2009, annual rates of any SUI procedure decreased, a trend which continued during the remainder of the study period (147 to 64 per 100 000 population, p<0.001). This trend was associated with a significant decrease in TVS procedures (130 to 60 per 100 000 population, p<0.001) over the same period as well as significant declines in each of the other SUI treatment modalities (p<0.001).

INTERPRETATION OF RESULTS

This large, population-based cohort demonstrates a significant influence of the FDA and Health Canada warnings on patient and physician behaviour regarding the management of SUI. Prior to 2009, despite decreased utilization of other surgical procedures, the overall number of SUI surgeries performed was significantly increasing driven by increasing utilization of TVS procedures. Following the regulatory warnings, the overall rate of SUI procedures significantly declined due to a decrease in the utilization of both TVS procedures and other operative interventions.

CONCLUDING MESSAGE

These data suggest that the regulatory warnings had a significant effect on how patients and physicians approach surgical management of SUI. Further, it suggests and that many women may be living with untreated SUI.

Funding University of Toronto Functional Urology Research Program - supported by a grant from Astellas **Clinical Trial** No **Subjects** None

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AUTOLOGOUS FASCIAL SLING FOR PRIMARY AND SECONDARY OPERATIVE TREATMENT OF STRESS URINARY INCONTINENCE : A RETROSPECTIVE CASE SERIES OVER 8 YEARS

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HYPOTHESIS / AIMS OF STUDY

To analyse the success and complication rates of Autologous Fascial Slings (AFS) for Stress Urinary Incontinence (SUI) in clinical practice – 8 years data.

STUDY DESIGN, MATERIALS AND METHODS

Retrospective case note review of patients who underwent AFS over the last 8 years (2010-2017) within a single tertiary referral unit. 96 procedures were identified through the audit database and electronic notes were reviewed with full follow-up data identified for 84 procedures (87.5%). 70 (72.91%) patients are more than 1 year and 13 (13.54%) more than 5 years since surgery.

RESULTS

All 84 patients had "Sling-on-a-String" . 59 patients had a non-obstructive autologous sling performed while 24 had obstructive slings. With growing concerns around mesh use for SUI surgery, use of AFS for primary SUI has been increasing. 26 (30.95%) of procedures were for primary treatment of SUI and 12 (14.28%) patients had AFS for primary SUI with complicated histories such as low mid urethral pressure profile, pre-existing voiding dysfunction or significant previous pelvic surgery. 46 (54.76%) patients had previously undergone at least one procedure for SUI of which 17 patients (20.23%) had previously experienced complications associated with mid urethral vaginal tapes. 42 (50%) patients had only SUI and 42 (50%) had mixed urinary symptoms. 15 (17.85%) had pre-existing voiding dysfunction. 3 patients performed Clean Intermittent Self Catheterisation (CISC) pre-operatively – the remaining 81 patients were taught CISC pre-procedure. The numbers of procedures have increased dramatically year on year with only 2 in 2010, 10 in 2014 and 23 in 2017.

Outcomes:

Success : 80 (95.23%) patients reported improvement in SUI symptoms.76 patients (90.47%) were cured and 4 patients (4.88%) reported improvement in their SUI symptoms. 2 of these patients have opted for tightening of sling – 1 of which was subsequently cured and the other awaiting the procedure.

4 (4.76%) patients reported no improvement of SUI symptoms at 6 months follow up. Two patients underwent redo of AFS both with subsequent cure of SUI. One patient opted for bladder neck injections. The final patient is considering further options.

(Table 1)

2 patients underwent release of sling (despite cure of stress incontinence symptoms)– 1 as she was experiencing pain and the other as she was not coping with CISC.

Complications:

Intraoperative : 3 Patients (3.57%) sustained bladder injuries which were managed conservatively.

Postoperative :

• 12 patients (14.28%) experienced worsening of overactive bladder symptoms.

• 18 Patients (21.42%) had UTI

• 25 (29.76%) developed abdominal wound infections requiring antibiotic treatment.

• 1 patient had wound dehiscence resulting in abdominal hernia

• 3 Patients (3.57%) have developed denovo chronic abdominopelvic pain which they attributed to AFS.

Voiding dysfunction : Graph 1

i) 49 patients (58.33%) were discharged using either CISC or with Foley catheter in situ. Of these 3 Patients were doing ISC preoperatively and have been excluded in further analysis of data.

ii) 20 (24.69%) patients continued to use CISC beyond 3 months postoperatively.

iii) Of 68 patients for whom > 1 year follow was available 13 patients (19.11%) were still doing CISC - 6 of these were doing so only once or twice per day with some spontaneous voiding. 8 of those continuing with CISC beyond 1 year had other risk factors for doing so - 5 of them had post-operative Botox for refractory overactive bladder and 3 of them had pre-operative voiding dysfunction. Patients undergoing obstructive slings, as expected, were more likely to have continued CISC use at each follow-up and beyond one year post-operatively.

INTERPRETATION OF RESULTS

AFS offer a good overall success rate (91.64%) both with primary (92.18%) and recurrent (89.13%) SUI in clinical practice. The significant year on year increase in numbers within our own unit demonstrates increasing patient and clinician confidence in AFS as an alternative to mesh based midurethral tapes.

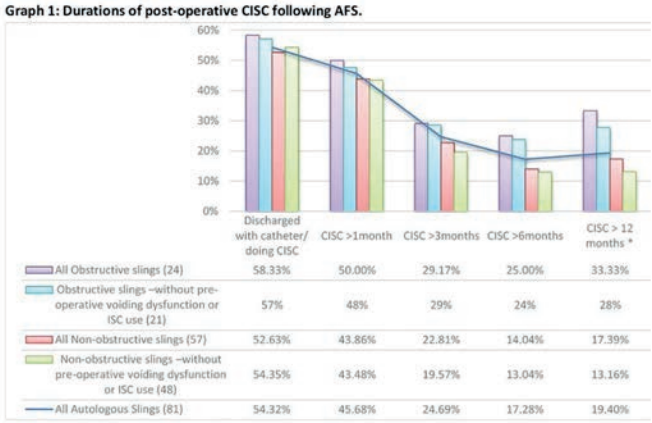
Our data shows overall 54.32% risk of short term voiding dysfunction (less than 1 month) and 19.40% risk of long term (> 12 months) CISC. Women opting for non-obstructive AFS slings with no preoperative voiding dysfunction can expect lower rates (13.16%) of long term CISC.

CONCLUDING MESSAGE

AFS provides an effective alternative to traditional mesh based mid urethral vaginal tapes.

FIGURE 1

Graph 1: Durations of post-operative CISC following AFS.



*Includes only patients for whom follow-up beyond 12m is available

FIGURE 2

Table 1: Indication and outcome of AFS for SUI surgery at 6 months

		Cured of Stress Incontinence Symptoms 90.47% (76)	Some improvement in symptoms 4.76% (4)	Not cured 4.76% (4)
Primary Surgery (26)	Non-obstructive (22)	90.91% (20)	4.55% (1)	4.55% (1)
	Obstructive (4)	100% (4)	-	-
Primary Surgery with complicated History (12)	Non-obstructive (6)	100% (6)	-	-
	Obstructive (6)	83.33% (5)	-	16.67% (1)
Secondary Surgery (46)	Non-obstructive (31)	83.87% (26)	9.68% (3)	6.45% (2)
	Obstructive (15)	100% (15)	-	-

REFERENCES
1. A Randomised controlled trial comparing two autologous fascial sling techniques for the treatment of stress urinary incontinence in women: short, medium and long-term follow-up. Guerrero K, et al. Int Urogynecol J Pelvic Floor Dysfunct. 2007 Nov;18(11):1263-70

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Retrospective case review only. **Helsinki** Yes **Informed Consent** Yes

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UNPLANNED HOSPITAL VISITS IN THE FIRST 30 DAYS FOLLOWING MIDURETHRAL SLING

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HYPOTHESIS / AIMS OF STUDY
To evaluate unplanned hospital visits within 30 days of midurethral sling placement in the form of emergency department visits, inpatient admissions, or repeat surgery.

STUDY DESIGN, MATERIALS AND METHODS
We included female patients who underwent midurethral sling without concomitant surgery (other than cystoscopy) and aged 20 years or older from a urology dataset including 3,431,366 individuals selected from the National Health Insurance Research Database for the year 2006 to 2010. Patients were evaluated for any unplanned hospital visits occurring within 30 days of index midurethral sling. These encounters were defined as adverse events or complications. These events or complications were categorized as: (1) outpatient surgery; (2) inpatient surgery; (3) inpatient admission; or (4) emergency department visit. Furthermore, we analyzed the risk factors associated with unplanned hospital visits after midurethral sling.

RESULTS
We identified 2894 female patients who underwent 2939 sling procedures between July 2007 and November 2010. Within 30 days, 210 sling procedures (7.1%) were accompanied by at least 1 unplanned hospital visit. This included 123 emergency department visits (4.2%), 72 inpatient admissions (2.4%), 22 inpatient surgeries (0.7%), and 9 outpatient surgeries (0.3%). Urinary tract infection and lower urinary tract symptoms were the most common emergency department visit diagnoses (25.6% of visits). Only two (1.5% of visits) visited emergency department due to urinary retention. Similarly, urinary tract infection and sling-related complications were the most common inpatient admission diagnoses (26.4% of admissions). Interestingly, diagnosis of psychiatric or emotional disorders occupied 16.7% of inpatient admissions. 75% of these patients had a past history of psychiatric or emotional disorders. In addition to hypertension, a patient's individual comorbidities were not associated with unplanned hospital visits after midurethral sling. Furthermore, hospital accreditations, patients' age, preoperative urinary tract infection and surgeons' specialties didn't affect unplanned hospital visits after midurethral sling.

INTERPRETATION OF RESULTS
The unplanned 30-day hospital visit rate following a midurethral sling procedure for female SUI is low at 7.1%. The majority of visits is to emergency departments, and around a quarter of these visits is for urinary tract infection or lower urinary tract symptoms. Women with the history of psychiatric or emotional disorders are prone to acute exacerbation-related inpatient admissions within 30 days of midurethral sling placement.

CONCLUDING MESSAGE
Our findings can be used to improve patient counseling and addressing these areas may reduce the number of unplanned visits after sling surgery.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Taipei Veterans General Hospital **Helsinki** Yes **Informed Consent** Yes

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THE OUTCOME OF IMPLANTATION OF A BLADDER NECK ARTIFICIAL URINARY SPHINCTER (BN AUS) FOR RECURRENT URODYNAMICALLY PROVEN STRESS AND MIXED URINARY INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY
The aim of this study was to assess the outcome of BN AUS insertion for recurrent or complex primary urodynamically proven stress urinary incontinence (SUI) and stress-predominant mixed urinary incontinence (MUI).

STUDY DESIGN, MATERIALS AND METHODS
A prospective database of women having BN AUS implantation by two surgeons for SUI and MUI was reviewed to assess the type and aetiology of the incontinence, previous surgery, the type of procedure and the outcome in terms of cure and complications

RESULTS
50 women aged 50.5 years (range 27-69) had BN AUS implantation, as above, between 2006 and 2016. Of these 34 had primary implants, 12 had a device replacement following mechanical failure and 4 had a new implant following previous explantation of an earlier device for erosion.

The aetiology was neurological in 17, recurrent stress urinary incontinence in 16, epispadias in 6, pelvic fracture urethral injury in 4, bilateral single ectopic ureter in 3, urethrovaginal

fistula in 1, augmentation urethroplasty in 1, congenital Mullerian anomaly in 1 and undiversion in 1.

43 had had previous surgery including cystoplasty, undiversion, urethroplasty, urethrovaginal fistula repair and anti-incontinence surgery.

The results and complications are listed below according to whether the patient underwent a one stage implantation of all the device components; a staged procedure in which the bladder neck cuff was implanted at the first procedure and the remaining components were implanted and the device activated six months or so later; and patients in whom just the cuff alone was implanted (stage 1 of the staged procedure) but the patients became continent with that alone and didn't require the rest of the components at a second stage.

INTERPRETATION OF RESULTS

BN AUS implantation has a 6% infection/erosion rate and a 16% chronic infection erosion rate leading to device explanation. For the 78% of women with functioning devices, incontinence is cured in 85% and improved in a further 10%. Only 2 patients remain wet and both have congenital anatomical abnormalities of the lower urinary tract.

CONCLUDING MESSAGE

BN AUS insertion remains is an important treatment options for women with complex incontinence. It is technically challenging surgery and should only be undertaken in high volume specialist centres for optimal results.

FIGURE 1

	Single Stage Procedure	Staged Procedure	Cuff Alone (4)	Total
N (%)	25	21	4	50
Component Repositioning	1	3	0	4
Mechanical Malfunction	0	2	0	2 (4%)
Device Infection	1	1	1	3 (6%)
Device Erosion	6	2	0	8 (16%)
Device Explantation	7	3	1	11 (22%)
New Onset Detrusor Overactivity	0	1	0	1 (2%)
CISC	8	6	1	15/39 (38%)*
Dry with AUS	16	14	3	33/39 (85%)*
Improved with AUS	2	2	0	4/39 (10%)*
Wet with AUS	0	2	0	2/29 (5%)*

*39 patients remaining after the 11 explants.

Funding Nil to disclose **Clinical Trial** No **Subjects** None

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EVALUATION OF SAFETY AND FUNCTIONAL OUTCOMES FOLLOWING LAPAROSCOPIC EXCISION OF MID-URETHRAL SLING MESH FOR CHRONIC PAIN

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HYPOTHESIS / AIMS OF STUDY

Retropubic mid-urethral slings are associated with a 3% risk of chronic pelvic or groin pain. For women requesting complete excision of mesh an open or laparoscopic approach is needed to dissect out the retropubic arms. While small series have reported good short term success rates, it is unclear which patients are most likely to benefit from mesh removal, and the risks of laparoscopic total mesh excision surgery, including recurrent stress incontinence, are not well described. From our case series of 56 women, we aimed to report technical feasibility and operative outcomes for complete and partial laparoscopic excision of mid-urethral slings, and evaluate patient reported functional outcomes from surgery.

STUDY DESIGN, MATERIALS AND METHODS

We identified all patients who underwent laparoscopic removal of mid-urethral sling mesh at two local hospitals between 2011 and 2016. Erosions of the lower urinary tract were excluded. We extracted data from patient records and theatre logs, and contacted all patients with a postal questionnaire, incorporating rating scales for pain, symptom severity and satisfaction. We used multivariate logistic regression to test for predictors of pain resolution and recurrence of stress incontinence.

RESULTS

Over the study period, 56 patients had a laparoscopic removal of a retropubic sling for chronic pain. The mean age was 48.5 years (range 30 - 71 years). The mean BMI was 28.4 (range 18 – 40). Nine women had undergone a prior attempt to remove the suburethral mesh using a vaginal approach. The median time from insertion to laparoscopic excision was 44 months (range 3 – 192 months). Most frequently reported site of pain was vaginal (n = 30), abdominal (n=28) and groin pain (n=22), but the majority of women reported pain at multiple sites (n=42). 22 women had additional non-pain symptoms they attributed to the mesh. Forty six patients (82%) had the retropubic mesh excised completely via a combined laparoscopic and vaginal procedure, and 10 (18%) underwent laparoscopic removal of the arms of the mesh with suburethral preservation for continence purposes. All were completed laparoscopically as intended. The cases took a median of 85 minutes (range 49-150 minutes). There was one return to theatre in the first 24 hours to evacuate a retropubic haematoma, but no bowel, bladder or ureteric injury occurred. The median inpatient stay was 2 days (range 1-7). Of the 46% (n=26) of patients who returned the questionnaire, 88% said they would recommend the procedure. There was a median 6 point decrease in pain scores (10 point

numerical rating scale, p<0.0001). 45% experienced worse subjective stress urinary incontinence. In logistic regression looking for improvement or resolution of pain at follow up, there was no impact of age (OR 0.99/year 95%CI 0.91-1.09), length of time sling in situ (OR 1.02/month 95%CI 0.99-1.04), or prior attempt at surgical removal (OR 2.70 95%CI 0.29-25.8). In a separate logistic regression model, excision of the suburethral portion of the mesh was strongly associated with de novo or worsening of stress incontinence (OR 10.72 95%CI 1.10-104.00).

INTERPRETATION OF RESULTS

Although laparoscopic removal is feasible, there were significant early and late complications. These risks must be balanced against unpredictable efficacy; we identified no factors associated with resolution of pain, although most patients did report cure or improvements in pain. De novo or worsening stress incontinence was also common, and was strongly associated with removal of the suburethral portion of mesh.

CONCLUDING MESSAGE

Failure to respond to conservative measures for pain following insertion of a retropubic sling should prompt discussion about the pros and cons of laparoscopic mesh removal. Careful preoperative counselling is required so that patients have realistic expectations for outcomes from this procedure, and despite the methodological limitations, this case series provides the best available data on which to base that counselling.

FIGURE 1

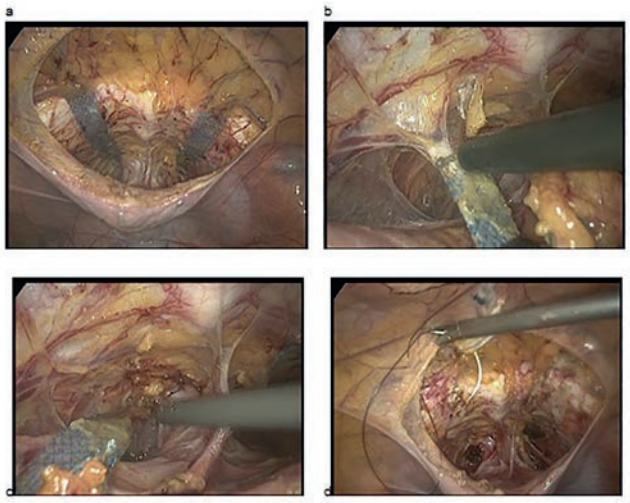

Figure 1a to d: Laparoscopic excision of retropubic sling arm. a) the cave of Retzius is opened showing the course of both arms b) with traction on the end of one arm dissection commences using monopolar hook c) the dissection is extended to the suburethral portion (when completely excising the mesh, removal of the vaginal portion prior to laparoscopy delineates the limit of laparoscopic dissection) d) the peritoneal incision is closed using monofilament suture

REFERENCES

1. J. Urol. 184, 610–615 (2010).
2. JSLS 10, 220–225 (2006)
3. Eur. Urol. 58, 270–274 (2010)

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** This was a routine service evaluation for a quality improvement project. **Helsinki** Yes **Informed Consent** Yes

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ADJUSTABLE MINI-SLING COMPARED TO CONVENTIONAL MID-URETHRAL SLINGS IN WOMEN WITH URINARY INCONTINENCE. 3-YEAR FOLLOW-UP OF A RANDOMIZED CONTROLLED TRIAL.

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HYPOTHESIS / AIMS OF STUDY

To compare the long-term subjective outcomes of an adjustable single-incision mini-sling (SIMS) vs. standard mid-urethral slings (SMUS) in women with stress urinary incontinence (SUI).

STUDY DESIGN, MATERIALS AND METHODS

The study was designed as a multicenter prospective randomized trial with women included from eight centers in three countries. Women under 60 years old with objectively verified stress urinary incontinence were randomized in blocks to SIMS or SMUS (TVT, TVT-O or TOT). A subjective cure rate of not less than 9% was anticipated in the SIMS group and using a one-sided test with the alpha value set to 5% and a power of 80%, the inclusion of 131 women was required in each arm. The data of 280 women was analyzed at one-year follow-up with no significant difference in objective or subjective outcomes (1). At 3-year follow-up women were evaluated regarding the subjective outcomes using the ICIQ-UI SF, ICIQ-OAB, PISQ-12, PGI-S and PGI-I questionnaires together with bladder diary. Subjective cure was defined as statement of no leakage in the ICIQ-UI SF or no leakage stated in the bladder diary.

RESULTS

In total 205 women participated in the 3-year follow-up; 107 in the SIMS and 98 in the SMUS group, with common baseline characteristics (Table 1, 2). No difference between the groups was observed regarding subjective cure rate, urgency, urge urinary incontinence, de novo dyspareunia or postoperative improvement. Number of micturitions per day was significantly lower in the SIMS group (Table 3). Subgroup analysis showed that women with mixed urinary incontinence (MUI) in the SMUS group demonstrated higher rates of improvement than women in the SIMS group (Table 4) and over-the-time analysis indicated an improvement regarding urge urinary incontinence for women in both groups after one year that remained at the same level at 3-year follow-up (Table 5).

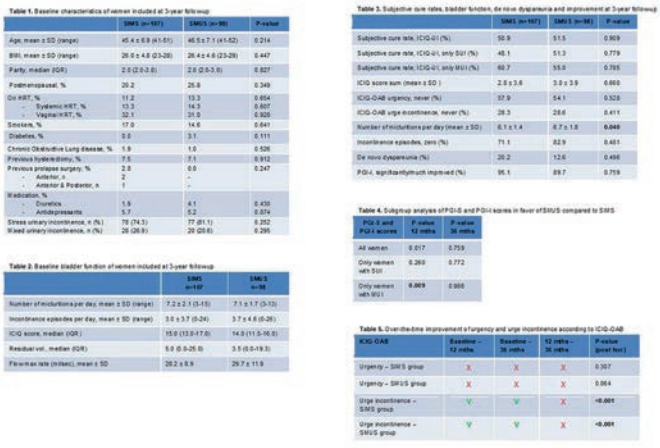
INTERPRETATION OF RESULTS

SIMS appears to perform equally to SMUS at 3-year follow-up of women with stress urinary incontinence with respect to patient-reported outcomes. Signs of variation exist concerning the number of micturitions per day and the improvement of the subgroup of women with mixed urinary incontinence. The positive effect of both methods on urge urinary incontinence seems to stabilize after one year.

CONCLUDING MESSAGE

The long-term effect of SIMS is comparable to that of SMUS regarding subjective postoperative outcomes.

FIGURE 1



REFERENCES

1. Rudnicki M, von Bothmer-Ostling K, Holstad A, Magnusson C, Majida M, Merkel C, Prien J, Jakobsson U, Teleman P. Adjustable mini-sling compared with conventional mid-urethral slings in women with urinary incontinence. A randomized controlled trial. Acta Obstet Gynecol Scand 2017; 96: 1347-1356.

Funding Lund University **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov: **Registration Number**: NCT01754558 **RCT** Yes **Subjects** Human **Ethics Committee** Local ethics committee of Region Zealand, Denmark. Regional ethics committee of Lund, Sweden. Ethics committee of Norway, REK. **Helsinki** Yes **Informed Consent** Yes

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UTILITY AND CRITICISM OF TELEMEDICINE IN UROGYNECOLOGY: A PROSPECTIVE STUDY.

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HYPOTHESIS / AIMS OF STUDY

In the last years telephone interview has been proposed as tool to follow-up patients after surgery in the home environment without transportation and loosing of time [1]. Limits of these studies were: retrospective evaluation, selection of no complicated cases, lack of comparison between the telemedicine result and the objective evaluation in a clinic setting. We prospectively compared telephone follow-up and in-clinic evaluation in a no selected population of women treated for stress urinary incontinence (SUI) and/or cystocele.

STUDY DESIGN, MATERIALS AND METHODS

A prospective crossover blind comparative study was done involving women referring to our outpatient clinic from December 2015 to December 2017 following surgery for cystocele and/or stress urinary incontinence. First patients' evaluation was done with a telephone interview. Telephone interview included a checklist of questions (figure 1) and validated questionnaires as The Patient Global Impression of Improvement (PGI-I), and Patient Perception of Bladder Condition (PPBC). At the end of the phone call all patient were scheduled for a conventional outpatient clinic setting for the next 7-12 days. In the in-clinic setting all women have been investigated with an interview and the same validated questionnaires. In-clinic setting allowed also objective outcome. Success rate of MUS at the phone call was considered when patient referred no episode of SUI. Nevertheless, at the office evaluation this data was checked by stress test. Objective cure of cystocele was defined in case of asymptomatic POP with the midline anterior vaginal wall inferior to the POP-Q 2nd stage. Correspondence between telephone and office follow-up was obtained with statistical evaluation by Cohen test.

RESULTS

A total of 297 women have been enrolled in the study. Characteristics of the population are reported in table 1-2. All surgical procedures were performed in our Department from 2000 to 2017, and were as follow: (i) synthetic MUS; (ii) anterior vaginal wall repair; (iii) synthetic MUS associated to anterior vaginal wall repair. In women with MUS 22% reported SUI recurrence at the phone interview. This group at in-clinic follow-up has shown a real SUI recurrence only in 13.5%, while part of the women misinterpreted urge urinary incontinence for IUS recurrence. No patient reported vaginal discharge nor the suspect of vaginal extrusion at telephonic and in-clinic follow-up. Patients with objective tape and/or mesh extrusion were 13. In the group treated for POP all women were able to refer by telephone interview a

prolapse recurrence and if it was symptomatic. No statistical significant difference was found analyzing PGI-I and PPBC questionnaires when administered by telephone or in clinic follow-up. Statistical analysis by Cohen test showed a "substantial agreement" (K=0.782) between the two methods of follow-up. Data reported in table 3.

INTERPRETATION OF RESULTS

Telephonic follow-up was successful assessing an anterior vaginal POP recurrence in all the women due to the fact that all women experienced the cystocele before surgery. Moreover, also in the case of dry women the detection rate was comparable in both follow-up. A first limits of telemedicine was the missed diagnosis of tape/mesh extrusion due to the lack of symptoms. Indeed, al women were no sexual active and with no tape infection. In these cases only an objective evaluation can lead to a correct diagnosis. The second limit was the overestimation of IUS recurrence due to the presence of de-novo urge incontinence not adequately interpreted by patients. The use of a dedicated checklist is suggested to focus the main clinical problems saving time.

CONCLUDING MESSAGE

Our data suggests that telephone follow-up can be a useful tool with some criticism: the missing diagnosis of tape/mesh extrusion and the overestimation of IUS recurrence. An appropriate counseling both preoperatively and at the telephonic controls may limit part of these criticisms.

FIGURE 1

Table 1. Population's main performed procedures.

			n.	Tot.	Mean age
MUS	TVT	18 %	22	122	66.8 ± 9.7
	TVT-O	82 %	100		
cystocele repair	Fascial	47.5 %	57	120	71.7 ± 9.2
	Biomesh	8.3 %	10		
	Mesh	44.1 %	53		
MUS	TVT	34.5 %	19	55	72.7 ± 10.4
&	TVT-O	65.4 %	36		
cystocele repair	Fascial	85.4 %	47		
	Biomesh	12.7 %	7		
	Mesh	1.8 %	1		

Table 2. Associated surgical procedures

	MUS + cystocele repair		All participants	
	n= 55	(%)	*n*=297	(%)
Vaginal hysterectomy	31/55	(56.3)	31/297	(10.4)
McCall Culdoplasty	31/55	(56.3)	31/297	(10.4)
Posterior vaginal wall repair	17/55	(30.9)	17/297	(5.7)

FIGURE 2

Table 3. Outcomes at telephone and in-clinic follow-up

	Telephone follow-up		In-clinic follow-up	
	%	*n*	%	*n*
Stress urinary incontinence	22	39/177	13.5	24/177
Urge urinary incontinence	13.5	24/177	22.5	43/177
Urgency	14.6	26/177	15.2	27/177
Tape/mesh vaginal extrusion	-	0/297	4.37	13/297
Vaginal bulging/POP	11.4	20/175	10.8	19/175
Dyspareunia	0.67	2/297	0.67	2/297
Voiding dysfunctions	1.01	3/297	1.01	3/297
PGI-I - *mean (SD)*	1.70 (1.23)		1.68 (1.27)	
PPBC - *mean (SD)*	1.84 (1.22)		1.78 (1.18)	

Figure 1. Checklist for telephone follow-up after cystocele operation or SUI operation

Patient number: **Observer:** **Date:**			
Follow-up evaluation by: ☐**telephone** ☐**clinic**	Not at all	Sometimes	Yes
Do you have sensation of bulging/protrusion from vagina?			
If bulging/protrusion is present does it bother you?			
Do you experience difficult emptying the bladder?			
Do you have vaginal discharge?			
Have you resumed your sexual life?			
Do you have experienced dyspareunia?			
Do you have tactile perception of abnormal vaginal mucosa?			
Does your partner refer the sensation of discomfort, or pain, or dyspareunia during penetration?			
Do you experience urinary incontinence?			
Is your urinary incontinence in connection to physical efforts like laughing, coughing, sneezing, exercising or lifting something heavy?			
Is your urinary incontinence related to sudden, intense urge to urinate followed by an involuntary loss of urine?			
Do you need to urinate often?			
Do you need to urinate during the nighttime?			
Have you had bladder infection since last medical control?			
Other to notify:			

REFERENCES

1. Jefferis H, Muriithi F, White B, Price N, Jackson S (2016). Telephone follow-up after day case tension-free vaginal tape insertion. Int Urogynecol J 27(5):787-790

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TRANSOBTURATOR TAPE: OVER 10 YEARS FOLLOW-UP

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HYPOTHESIS / AIMS OF STUDY

The growth of the elderly population in western countries highlights the importance of studying the long-term outcomes of the various treatments of chronic conditions, including urinary incontinence.

The aim of this study is to assess the outcomes in incontinent patients who underwent TOT with a 10-year minimum follow-up.

STUDY DESIGN, MATERIALS AND METHODS

This is a single-center prospective study on women who underwent TOT for stress urinary incontinence (SUI) or stress predominant mixed urinary incontinence.

Pre-operatively, all patients underwent a standardised preop urogynaecological work-up including: urogynecological history; pelvic examination using the POP-Q classification; standardised cough stress test (CST) performed in the standing position at a bladder volume of 300 mL or at maximum cystometric capacity if it was less than 300mL; conventional urodynamic study (according to ICS criteria). Urinary symptoms were evaluated using a structured questionnaire and the standardised questionnaire UDI-6. In particular, the voiding phase was evaluated in the structured questionnaire in terms of yes-no questions on hesitancy, slow-stream, intermittency, straining to void, and feeling of incomplete emptying (as defined by ICS), and in UDI-6 question 5, which gives 4 degrees of difficulty in voiding. SUI was defined according to ICS standardisation and classified according to the Ingelmann-Sundberg scale. The King's Health Questionnaire (KHQ) was used to evaluate Quality of Life (QoL).

TOT surgery was performed according to the technique described by Delorm.

In September-October 2017 all patients who had undergone TOT before 2007 were recalled for follow-up. They completed the same pre-op questionnaires used in the pre-op evaluation. The subjective cure rate was evaluated using the Patient Global Impression of Improvement (PGI-I): success was defined as 'very much better' or 'much better' on the PGI-I scale.

The primary outcome was the SUI cure rate. Secondary outcomes included improvement in QoL, effect on the other urinary symptoms and late adverse events. Institutional Review Board Committees approved this study; participants gave informed consent.

For statistical analysis we used the McNemar chi-square test for continuous non-parametric variables, the Fisher's exact test for categorical variables and the t-test for continuous parametric variables. We considered $p<0.05$ to be statistically significant.

RESULTS

From January 2003 to December 2007, 136 consecutive patients underwent TOT. Thirteen patients were lost to follow-up, so we report data on 123 patients. Of these 32 (26.1%) had SUI grade 1 according to the Ingelmann-Sundberg scale, 67 (57.5%) had SUI grade 2 and 24 (19.5%) had SUI grade 3.

Mean age was 58.3+9.94; median parity was 2; mean BMI 27.22+2.76; 87 patients (70.2%) were menopausal.

At a mean follow-up of 145 months (121-181 months), 77 patients (62.6%) were subjectively cured for SUI. Of the 46 failed patients 31 (25.2%) had SUI grade 1, 9 (7.3%) had SUI grade 2, and 6 (4.9%) had SUI grade 3. Only 10 of the failed patoents underwent further SUI surgery: 8 underwent TVT and 2 underwent bulking agent therapy.

Urgency reduced statistically significantly (from 67.5% to 38.3%, $p<0.005$), as did urgency urinary incontinence (from 56.9% to 31.7%, $p<0.005$). De novo urgency occurred in 7.3% of cases.

Voiding symptoms increased from 8.9% to 18.7% ($p=0.37$). De novo voiding symptoms appeared in 14.6% of patients.

All domains of the KHQ except general health and sleep saw statistically significant improvements.

We had 5 cases of partial mesh extrusion, requiring tape revision; none became incontinent.

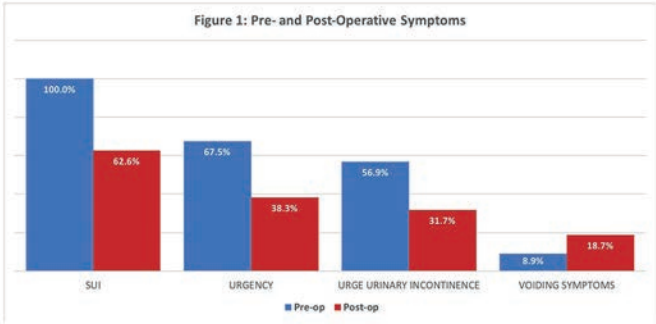
INTERPRETATION OF RESULTS

Our study demonstrates that TOT can be considered safe and effective with good long-term outcomes. At a follow-up of ten or more years, also if cure rates are lower than in shorter-term studies, however, at 62.6%, they may still be considered satisfactory. It is difficult to ascertain if this decline, 10 years or more after surgery, is due to long-term treatment failure or to general factors like age or another pathology.

CONCLUDING MESSAGE

In our study TOT procedure appeared to be an effective minimally invasive procedure for SUI with low rate of complication and satisfactory long-term outcome.

FIGURE 1



REFERENCES

1. Kelleher CJ, Cardozo LD, Khullar V., A new questionnaire to assess the quality of life of urinary incontinent women. Br J Obstet Gynaecol. 1997
2. Artibani W, Pesce F, Prezioso D., Italian validation of the urogenital distress inventory and its application in LUTS patients. Eur Urol. 2006.
3. Delorme E. Transobturator urethral suspension: mini-invasive procedure in thetreatment of stress urinary incontinence in women. Prog Urol. 2001; 11:1306-13.

Funding No discosures **Clinical Trial** Yes **Registration Number** Ceas Umbria **RCT** No **Subjects** Human **Ethics Committee** Ceas Umbria **Helsinki** Yes **Informed Consent** Yes

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LONG-TERM RESULTS IN WOMEN WITH DETRUSOR UNDERACTIVITY AND STRESS URINARY INCONTINENCE UNDERGOING SUBURETHRAL SLING: PREDICTIVE FACTORS FOR SUCCESSFUL OUTCOME

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HYPOTHESIS / AIMS OF STUDY

Stress urinary incontinence (SUI) affects the quality of life in women.Therefore, suburethral sling is needed in this group of patient. However, for patients with SUI combined with detrusor underactivity (DU), the benefit of suburethral sling is still controversial. The aims of the study are to survey the outcomes of patients with both SUI and DU after suburethral

sling operation, to assess the associated predictive factors, and to evaluate the long-term satisfaction.

STUDY DESIGN, MATERIALS AND METHODS

The medical records of 71 female patients who were treated with suburethral sling for SUI and DU between 1990 and 2017 were retrospectively analyzed. Patients were categorized into three subgroups based on the etiology of SUI and DU, including spinal cord injury (SCI) or stroke (n=9), pelvic radiotherapy with/without radical hysterectomy (n=27), and others cause of DU (n=35). For the primary outcome, we analyzed the proportion of patients in three different outcomes, including: (1) improved incontinence without clean intermittent catheterization (CIC), (2) absence or improved incontinence with CIC and (3) no improvement in incontinence, based on whole sample (n=71) and different subgroups. For the secondary outcome, chi-square test and multivariate logistic regression were used to analyze the selected parameter of video urodynamics; age and number of vaginal spontaneous delivery to find the predictive factors for three types of outcome mentioned above. The incontinence impact questionnaire-7 (IIQ-7) and urogenital distress inventory-6 (UDI-6) were used to analyze patients' satisfaction before the anti-incontinence operation, and at 6 months and 12 months after the operation.

RESULTS

After operation, out of 71 patients, 39 (54.9%) had improvement in incontinence without CIC, 15 (21.1%) had absence or improvement in incontinence with CIC, and 17 (23.9%) had no improvement in incontinence. In the patients of SCI or stroke, 2 (22.2%) had improved incontinence without CIC, 4 (44.4%) had absence or improved incontinence with CIC, and 3 patients (33.3%) had no improvement in incontinence. In the patients with pelvic radiotherapy / radical hysterectomy, 14 (51.9 %) had improved incontinence without CIC, 6 (22.2%) had absence or improved incontinence with CIC and 7 (25.9 %) had no improvement in incontinence. In the third group patients, 23 (65.7 %) had improved incontinence without CIC, 5 (14.3 %) had absence/improved incontinence with CIC, and 7 (20%) had no improvement in incontinence. There was no significant difference between three subgroups and three type outcomes (P= 0.181). (Table 1) In patients with a measurable voiding detrusor pressure (Pdet) ≥ 10 cmH2O or <10 cmH2O, there was no significant difference in three type outcomes between them (P=0.062). And in patients with Pdet ≥ 15 cmH2O or <15 cmH2O, there was no significant difference in three type outcomes between them (P= 0.05). However, there was a significantly higher proportion (72.7%) of patients with Pdet ≥ 15 cmH2O which had improved incontinence without CIC (P= 0.043). There was a significantly lower proportion (4.54%) of patients with Pdet ≥ 15 cmH2O who had absence/improved incontinence with CIC (P= 0.022). In patients with abdominal pressure (Pabd) ≥ 37 cmH2O or < 37cmH2O, there was no significant difference in three type outcomes between them (P=0.071). But there was a significantly higher proportion (66.7%) of patients with Pabd < 37 cmH2O who had improved incontinence without CIC (P= 0.037). There was a significantly lower proportion (12.8%) of patients with Pabd < 37 cmH2O who had absence/improved incontinence with CIC. The mean of UDI-6 at the time of pre-operation, 6 months after operation and 12 months after operation were 8.6, 4.8 and 4.4, respectively. There was significantly decreased UDI-6 score between pre-operation and 6 months after operation (P= 0.00) and 12 months after operation (P=0.00). The mean of IIQ-7 at the time of pre-operation, 6 months after operation and 12 months after operation were 10.13, 4.38 and 4.18, respectively. There was significant decrease of IIQ-7 score between pre-operation and 6 months after operation (P= 0.00) and 12 months after operation (P=0.00). In multivariate logistic regression, analysis showed the only statistically significant difference in Pdet <10 cmH2O and <15 cmH2O was Pabd (P=0.003 and P=0.000 respectively). In patients with Pabd < 37 cmH2O, only Pdet was statistically different (P=0.002).

INTERPRETATION OF RESULTS

After anti-incontinence surgery 76.1% of the patients who had SUI combined with DU could have improved incontinence without (54.9%) or with CIC (21.1%). In the SCI/ stroke subgroup, an improved outcome could still ieved with or without CIC, indicating this group patientshad more severe grade of DU. In the pelvic radiotherapy / radical hysterectomy subgroup, most patients had improved incontinence without CIC. In the other paients, up to 65.7% had improved incontinence without CIC. For the analysis of predictive factors, we found both Pdet and Pabd did not directly have effect on the three types of outcome. But for patients with Pdet ≥ 15 cmH2O, there were significant differences when we separated the outcome into improved incontinence without CIC or not, and separated the outcome into absence/improved incontinence with CIC or not. In terms of UDI-6 and IIQ-7, we found all scores decreased between pre-operation, 6 months and 12 months post-operatively, suggesting these patients were satisfied with treatment outcome although some of them need CIC after anti-incontinence surgery.

CONCLUDING MESSAGE

In women with SUI and DU, suburethral sling procedure is effective in improving the condition of SUI and quality of life. Pdet and Pabd are the only statistically significant predictive factors of surgical outcome. A lower Pdet favored the outcome of improved incontinence with CIC, while a higher Pabd tends to present the outcome of the use of CIC.

FIGURE 1

Table 1.

Outcome	Subgroup			Total
	1	2	3	
Improved incontinence, absence of CIC	2	14	23	39
	5.13%	35.90%	58.97%	100%
No incontinence / improved incontence present of CIC	4	6	5	15
	26.67%	40.00%	33.33%	100.00%
No improvement incontinence	3	7	7	17
	17.65%	41.18%	41.18%	100.00%
Total	**9**	**27**	**35**	**71**

Subgroup-1: Spinal cord injury and/or stroke, Subgroup-2: R/T and/or Radical hysterectomy, Subgroup-3: Other, Chi-Square: 6.25, P-value: 0.181

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Research **Ethics Committee**, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation **Helsinki** Yes **Informed Consent** No

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ABDOMINAL STRAINING IN UNCOMPLICATED STRESS URINARY INCONTINENCE: IS THERE A CORRELATION WITH VOIDING DYSFUNCTION AND OVERACTIVE BLADDER?

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HYPOTHESIS / AIMS OF STUDY

In the last years, the role of urodynamic investigations in the preoperative evaluation of female stress urinary incontinence (SUI) has been questioned (VALUE Trial)(1). Several authors state that the execution of invasive urodynamic investigations does not change the surgical outcomes or the following therapeutic decisions in patients with uncomplicated SUI. On the other hand, some urodynamic parameters have been correlated with poorer surgical outcomes (2). The aim of this study is to assess the impact of preoperative patient's use of abdominal straining on postoperative outcomes in women treated with surgery for uncomplicated SUI.

STUDY DESIGN, MATERIALS AND METHODS

Data from consecutive female patients who underwent suburethral tape - obturator approach (TVT-O) surgery for SUI in one center were prospectively collected and retrospectively analyzed. Patients were categorized as presenting with uncomplicated stress urinary incontinence according to the definitions used in the VALUE trial. Briefly, inclusion criteria were: history of pure SUI without voiding dysfunction, detrusor overactivity and OAB. Exclusion criteria included previous UI surgery, pelvic radiation, pelvic surgery within the last 3 months, and anterior or apical pelvic organ prolapse (POP) ≥ +1 cm. All patients underwent an office evaluation including history and physical examination and a urodynamic investigation comprising uroflowmetry with postvoid residual volume (PVR) evaluation, cystometry and pressure/flow study. Patients were divided in two groups, according to the presence or absence of use of abdominal straining during voiding (present in group A, absent in group B).

At five year follow up, patients were investigated for presence of voiding dysfunction (VD, defined through lower urinary tract symptoms of the voiding phase and urodynamics signs: PVR > 100 ml and Qmax < 15 ml/s) and de novo overactive bladder syndrome (OAB). Post-TVT-O urinary retention (UR) was defined as the need of intermittent or at least 24h permanent catheterization with or without a sling revision.

RESULTS

One hundred and ninety-two female patients underwent TVT-O surgery for uncomplicated SUI. Preoperative abdominal straining was identified in 60/192 patients (Group A: 31.2% of the patients). Qmax was not different in the two groups (Group A: 19,5 vs. Group B: 20,5 ml/s, p=0,76). Demographics was similar for the two groups regarding age, parity, BMI (p>0,05). At a 5 year follow up, UR cases were not statistically significant (Group A: 4 vs. Group B: 2, p=0,08). VD was reported in 9/60 (15%) patients in Group A and 8/132 (6%) patients in Group B (p=0,056), OAB was reported in 23/60 (38,3%) patients in Group A and 26/132 (19,7%) patients in Group B (p=0,007).

INTERPRETATION OF RESULTS

Preoperative use of abdominal straining was found to be related to a significant higher incidence of de novo OAB. In particular, OAB was present in 38,2% of patients using vs. 19,7% of patients not using abdominal straining. The risk of developing OAB after TOT surgery seems to be almost twofold higher among female patients with uncomplicated SUI using abdominal straining. Although a significant correlation was not found, a trend for a higher incidence of postoperative voiding dysfunction was also observed in preoperative abdominal straining patients (15% vs 6% in the non-straining patients, p=0,056).

CONCLUDING MESSAGE

The use of abdominal straining seems related to the risk of developing OAB. A trend for a higher percentage of patients with VD among patients using the abdominal straining during voiding was also found. Further and best powered studies are needed to better define the impact of preoperative abdominal straining on OAB and voiding dysfunctions in women who undergo SUI surgery. Nevertheless, the role of invasive urodynamics seems relevant in providing more informations to surgeons and to patients on the probability for female subjects with uncomplicated SUI to develop de novo OAB.

REFERENCES

1. Nager CW, Brubaker L, Litman HJ, Zyczynski HM, et al. A Randomized Trial of Urodynamic Testing before Stress-Incontinence Surgery. N Engl J Med 2012; 366:1987-1997
2. Giarenis I, Cardozo L. What is the value of urodynamic studies before stress incontinence surgery? BJOG 2013;120:130–132

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SEVERITY RANGES OF THE INTERNATIONAL PROSTATE SYMPTOM SCORE (IPSS); PROPOSAL TO ADJUST THE BANDING USING BASELINE DATA OF A LARGE RANDOMISED TRIAL IN SECONDARY CARE

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HYPOTHESIS / AIMS OF STUDY

Ninety percent of men aged 50 to 80 years suffer from at least 1 lower urinary tract symptoms (LUTS) including storage symptoms, voiding symptoms and post-voiding symptoms. LUTS can compromise quality of life (QOL) and other social and sexual activities. Prevalence and severity increase with age and the progressive increase in the aged population group has emphasized the importance to our society of appropriate and effective management of male LUTS.

The International Prostate Symptom Score (IPSS), originally known as the American Urological Association symptom index for benign prostatic hyperplasia [1], is one of the most developed questionnaires to assess LUTS. Seven separate items are scored from 0 to 5, so the overall scale ranges from 0 to 35, where higher scores indicate more severe symptoms. To categorize patients' symptoms and help physicians to manage treatment, the banding of symptom severity was set as 1-7 mild, 8-19 moderate, 20-35 severe. However, this banding was developed with generic groups involving LUTS and non-LUTS patients [1], and a previous study found men with voiding symptoms, storage symptoms and no symptoms to have average IPSS scores of 16.8, 14.6 and 8.5, respectively [2]. These figures implied that current banding might not be appropriate for grading LUTS patients by symptom severity.

To evaluate current banding of IPSS without any confounding of physician and institutional bias, clinical information from the Urodynamics for Prostate Surgery Trial; Randomised Evaluation of Assessment Methods (UPSTREAM), were used in the current study. UPSTREAM study is being conducted in major 26 multicentre United Kingdom (UK) to establish whether a care pathway not including invasive urodynamics is no worse than one in which it is included in men who are considering further treatment where surgery might be an option for BOO [3].

STUDY DESIGN, MATERIALS AND METHODS

797 male patients seeking any treatment for their bothersome LUTS were recruited at urology departments of 26 hospitals in the UK. Recruitment was performed by research nurses and urologists in each centre and descriptive information, symptom assessment, flow rates and urinalysis were collected. Written informed consent was obtained from all enrolled patients.

This study extracted and analyzed the following baseline record including age, IPSS, IPSS-QOL score, urine flow rate measurement (maximum urinary flow rate (Qmax) and voided volume) and ultrasound estimate of post-void residual urine (PVR).

For statistical analysis, the Shapiro-Wilk test and normal Q-Q plot test were used to check the distribution and the normality of IPSS score in enrolled groups. To determine the cutoff point of IPSS for banding, the sensitivity and specificity levels derived from the receiver operating characteristic (ROC) curve plotted using scores of patients documenting worse IPSS-QOL scores were investigated. These were determined using 2 different cut-offs: firstly IPSS-QOL rated between "mixed" and "mostly dissatisfied"; secondly between "mostly dissatisfied" and "Unhappy". A multivariate logistic regression model with backward selection was used to evaluate the relationships between IPSS-QOL and the IPSS and other subjective clinical factors. A stringent threshold was set for determining variable entry and removal from the multivariate analysis. IPSS was categorized by new banding and the other clinical factors were categorized by the median value. All data were analyzed using the SPSS software package (SPSS 24, Chicago, Illinois). All statistical tests were two-sided and were considered to be statistically significant for $P < 0.05$.

RESULTS

The average age of 797 patients was 67.7 ± 9.2 years old. The normality test rejected the null hypothesis that IPSS was derived from a normally distributed population ($P<0.001$, Figure 1A). ROC curve showed 15 and 23 were the cut-off points as a predicter of patients QOL impact (for both the IPSS-QOL cut-off points chosen) (Figure 1B). The area under the receiver operating curve (AUROC) showed higher value in IPSS (0.725) than the other objective tests (for example, 0.465 in Qmax). Figure 1C showed the new banding (1-14 mild, 15-22 moderate, 23-35 severe) could divide LUTS male patients more consistently and reliably than the current banding (1-7 mild, 8-19 moderate, 20-35 severe). Multivariate analysis showed that new banding of IPSS is an independent predictor of patients QOL ($P<0.001$).

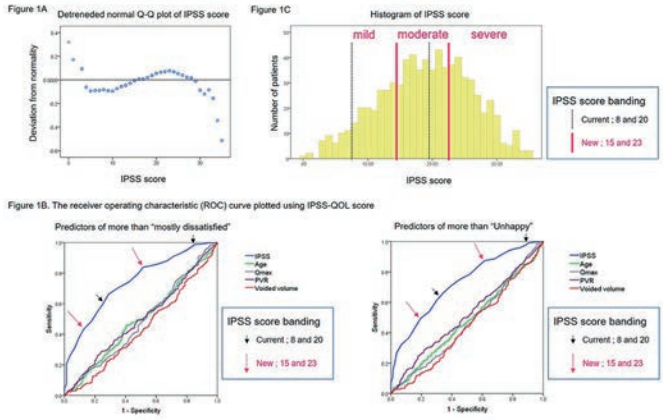
INTERPRETATION OF RESULTS

Normality test rejections indicated median or quartile value are not a suitable basis to derive banding of IPSS severity. ROC curve clearly indicated cutoff value of IPSS at 15 and 23 with higher AUROC than the other objective tests including uroflow. Multivariate analysis also showed independent and statistically significant relationship of the new banding of IPSS to assess QOL of male LUTS patients. Current banding thresholds, 8 and 20, showed no impact in these analysis.

CONCLUDING MESSAGE

This is the first study to validate a severity banding of IPSS scores using multicenter trial data, and proposes a new banding which reasonably divides male LUTS patients with statistically significant relationship to QOL.

FIGURE 1



REFERENCES

1. Barry MJ, Fowler FJ, Oleary MP, Bruskewitz RC, Holtgrewe HL, Mebust WK, Cockett ATK, Blaivas JG, Wein AJ. The American-Urological-Association Symptom Index for Benign Prostatic Hyperplasia. J Urol. 1992;148:1549–57.
2. Liao CH, Chung SD, Kuo HC. Diagnostic value of International Prostate Symptom Score voiding-to-storage subscore ratio in male lower urinary tract symptoms. Int J Clin Pract. 2011;65:552–8.
3. Bailey K, Abrams P, Blair PS, Chapple C, Glazener C, Horwood J, Lane JA, McGrath J, Noble S, Pickard R, et al. Urodynamics for Prostate Surgery Trial; Randomised Evaluation of Assessment Methods (UPSTREAM) for diagnosis and management of bladder outlet obstruction in men: study protocol for a randomised controlled trial. Trials. 2015;16:567.

Funding This project was funded by the National Institute for Health Research HTA programme (project number 12/140/01). This study was designed and delivered in collaboration with the Bristol Randomised Trials Collaboration (BRTC), a UKCRC Registered **Clinical Trial**s Unit in receipt of National Institute for Health Research CTU support funding. **Clinical Trial** Yes **Registration Number** The National Institute for Health Research HTA programme (project number 12/140/01) **RCT** Yes **Subjects** Human **Ethics Committee** The study will be conducted in accordance with the recommendations for physicians involved in research on human subjects adopted by the 18th World Medical Assembly, **Helsinki** 1964 and later revisions. All 26 centres in UPSTREAM are approved by a centralised ethics committee (Oxford B Research **Ethics Committee** reference: 14/SC/0237). **Helsinki** Yes **Informed Consent** Yes

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TRANSPERINEAL ULTRASOUND MEASUREMENT OF MEMBRANOUS URETHRAL LENGTH IN MEN PRIOR TO RADICAL PROSTATECTOMY

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HYPOTHESIS / AIMS OF STUDY

Preoperative membranous urethral length (MUL) prior to radical prostatectomy (RP) is a prognostic patient anatomical factor that affects the recovery of continence following surgery(1). MUL is important because the structure and function of the membranous urethra is inherently associated with the urinary sphincter complex containing the smooth muscle fibres of the internal sphincter and surrounded along its entire length by the rhabdosphincter. Acquiring MUL measurements in routine urological clinical practice is often limited to facilities that are able to refer patients to time- and resource-intensive MRI radiological services. The development of an alternative, non-invasive imaging method that is reliable, clinically accessible, less resource intensive and has good agreement with the established, gold standard MRI methodology for the measurement of MUL is warranted. Transperineal ultrasound (TPUS) is a well-established non-invasive imaging modality used in outpatient urological clinical practice, including for the assessment of male pelvic floor muscle function(2, 3). TPUS has the potential to visualise the anatomical landmarks required for MUL measurements. Our aim was to compare the measurement of MUL using the gold standard MRI methodology with a novel 2D transperineal ultrasound (TPUS) methodology.

STUDY DESIGN, MATERIALS AND METHODS

MUL was prospectively measured in 18 male patients prior to radical prostatectomy using MRI and in two different patient positions using TPUS; the patient supine with the knees extended (Supine) and supine with the knees flexed to 70 degrees (Supine KF). Agreement between TPUS and MRI measurements of MUL was assessed using Bland-Altman method comparison techniques and a two-way mixed effects single measures intraclass correlation (ICC).

RESULTS

The mean difference in MUL measurements between MRI and i) TPUS Supine was -0.8mm (95% limits of agreement (LOA): -3.2, 1.7) and ii) TPUS Supine KF was -0.8mm (95% LOA: -3.5, 1.9). ICC indicated a point estimate of excellent agreement between MRI and TPUS Supine ICC 0.93 (95% CI: 0.76, 0.98) and TPUS Supine KF ICC 0.91 (95%CI 0.74, 0.97).

INTERPRETATION OF RESULTS

To our knowledge, our investigation is first to report excellent agreement and small differences between MRI and TPUS measurements of MUL in two supine patient positions. The excellent agreement and small differences between the MRI and TPUS measurements of MUL were consistent in both the Supine and Supine KF patient positions. TPUS imaging, while providing less delineation of the anatomical structures of the lower urinary tract compared to MRI, permitted the reliable measurement of MUL. Since ultrasound imaging quality can be affected by operator and patient factors, individual preference may be given by clinicians to select a particular patient positon.

CONCLUDING MESSAGE

Preoperative MUL can be reliably used to measure MUL using TPUS in two supine positions, demonstrating excellent agreement with gold standard MRI measurements of MUL. TPUS provides clinicians with an accessible non-invasive alternative to MRI for the measurement of MUL that can be used in outpatient settings and when MRI is contraindicated.

REFERENCES

1. Mungovan SF, Sandhu JS, Akin O, Smart NA, Graham PL, Patel MI. Preoperative Membranous Urethral Length Measurement and Continence Recovery Following Radical Prostatectomy: A Systematic Review and Meta-analysis. Eur Urol. 2017;71(3):368-78. doi: 10.1016/j.eururo.2016.06.023. PubMed PMID: 27394644.
2. Stafford RE, van den Hoorn W, Coughlin G, Hodges PW. Postprostatectomy incontinence is related to pelvic floor displacements observed with trans-perineal ultrasound imaging. Neurourol Urodyn. 2017. doi: 10.1002/nau.23371. PubMed PMID: 28745804.
3. Stafford RE, Ashton-Miller JA, Constantinou C, Coughlin G, Lutton NJ, Hodges PW. Pattern of activation of pelvic floor muscles in men differs with verbal instructions. Neurourology & Urodynamics. 2016;35(4):457-63. PubMed PMID: 25727781.

Funding Drs Oguz Akin and Jaspreet S Sandhu were supported in part through the NIH/NCI Cancer Center Support Grant P30 CA008748. **Clinical Trial** No **Subjects** Human **Ethics Committee** Western Sydney Local Health District Human Research **Ethics Committee Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "PROSTATE CLINICAL / SURGICAL"

MULTI-CHANNEL URODYNAMIC ASSESSMENT IN MEN WITH POST-PROSTATECTOMY URINARY INCONTINENCE: A COST UTILITY ANALYSIS

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HYPOTHESIS / AIMS OF STUDY

Persistent bothersome urinary incontinence after radical prostatectomy can significantly impact quality of life. Men with post-prostatectomy incontinence (PPUI) receive standard investigation (SI) consisting of history, physical examination and cystoscopy. In complex cases of unclear etiology, they receive urodynamic (UDS) assessment, although this is not standard and there is little evidence regarding the impact of multichannel UDS on patient outcomes and costs in the management of PPUI. Our aim is to understand the impact of standard investigation (SI) vs SI and multichannel urodynamics (UDS) in men with post-prostatectomy urinary incontinence (PPUI) on quality adjusted life expectancy and to compare the cost-utility of treatment decisions. We hypothesize that pre-operative SI+UDS will improve the quality adjusted life expectancy for such men and the cost-utility of treatment decisions for PPUI as compared to SI alone.

STUDY DESIGN, MATERIALS AND METHODS

We constructed a Markov model employing a two-dimensional (2D) Monte Carlo simulation using a lifetime horizon to compare the quality-adjusted life expectancy associated with the use of preoperative SI+UDS compared to SI. The primary assumption of the model was that UDS is always accurate at identifying the diagnosis, as there is no gold standard test to identify post-prostatectomy incontinence. We validated our model using the results of previous retrospective studies. We considered clinically important health states from immediately after investigation, initial treatment, commonly described complications, and failure of treatment. Transition probabilities and utilities for disease states were derived from a literature search of MEDLINE and expert consensus. Direct healthcare costs were derived from national and provincial health administrative data. Using the simulation results, we conducted a cost-utility analysis of preoperative SI+UDS compared to SI.

RESULTS

Men assessed with SI+UDS assessment were incontinent for 12.4 months less than those assessed with SI alone. Of the patient simulated, 25% fewer patients experienced medication failure. Patients treated with SI+UDS had an incremental cost utility ratio (ICUR) of $1110 per quality adjusted life year. SI+UDS was cost-effective with a willingness-to-pay (WTP)

threshold set at $50 000 per quality adjusted life year (QALY) gained. In deterministic sensitivity analysis, the model was sensitive to patient age at treatment with SI+UDS becoming the dominant strategy after a threshold age of 70. In probabilistic sensitivity analysis, the model was robust to parameter uncertainty across 1 million iterations. The probability of UDS+SI being cost-effective was 83% at a WTP of $50,000/QALY.

INTERPRETATION OF RESULTS

This model-based cost-utility analysis suggests that SI+UDS is a economically favorable approach compared to SI in the pre-treatment workup of men with PPUI. Men assessed with SI+UDS assessment lived with incontinence 12.4 months less than those assessed with SI alone and experienced less medication failure. The addition of UDS assessment to SI was cost-effective 83% of the time in our model. The model suggests that patient age is important to consider in pre-treatment workup, and for men over 70 years, SI+UDS is always the most cost-effective approach. Limitations of this study include assumptions regarding the accuracy of UDS assessment, ignoring the development of patient comorbidity that could impact on treatment decisions, and focusing on single treatment modalities for stress (AUS) or urge (oral medication) incontinence.

CONCLUDING MESSAGE

In this cost-utility analysis model, multi-channel urodynamics with standard investigations is economically favourable compared to standard investigations alone in the pre-treatment assessment of men with post-prostatectomy incontinence. Future studies should be conducted to validate these findings in a real population.

FIGURE 1

Table 1 Cost-utility results from Markov microsimulation comparing preoperative standard preoperative investigation with urodynamics (SI + UDS) to standard investigation (SI) alone.

Pre-operative Testing Strategy	SI + UDS	SI	Difference
Quality adjusted life expectancy[QALY] (mean)			
Undiscounted	14.5	14.2	0.3
Discounted (1.5%)	13.7	14.0	0.3
Total Cost (mean)			
Undiscounted	$10,453	$10,118	$334
Discounted (1.5%)	$10,462	$10,127	$335
ICUR (cost/QALY)			
Undiscounted			$1,198
Discounted (1.5%)			$1,110

Funding None **Clinical Trial** No **Subjects** None

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TOWARD COMPETENCY-BASED CURRICULUM IN FUNCTIONAL UROLOGY: CANADIAN CHIEF UROLOGY RESIDENTS EXPERIENCE

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HYPOTHESIS / AIMS OF STUDY

There is a lack of uniformity in functional urology teaching during postgraduate urology training across Canada. Therefore, we aimed to identify extents of deficiency in functional urology education, and to develop an infrastructure that incorporates learning material, tools, and facilities into a uniform educational system.

STUDY DESIGN, MATERIALS AND METHODS

This is a retrospective study of a functional urology education assessment of 18 chief urology residents from eight different Canadian training institutions. The data was collected during a comprehensive two-day functional urology course designed for Canadian chief urology residents. Residents answered a basic questionnaire immediately prior to a pre-course assessment exam, in which they evaluated their competency (self-evaluation of competency to manage independently patients with voiding dysfunction), certainty (overall self-perceived confidence level upon managing patients with voiding dysfunction) and satisfaction (satisfaction level with regard to the overall effectiveness/quality of functional urology teaching during residency) in this urology subspecialty. Their performance in functional urology was assessed with a comprehensive written exam of short answers and multiple-choice questions, before and after the course completion, intended to be comparable to the format of the Royal College of Surgeons of Canada urology examination.

RESULTS

Overall, residents (n=18) achieved significantly higher post-course total score (78.6 % post course versus 55.4% pre-course, P =0.001), with an estimated mean percentage of change of approximately 44%. Based on a 5-point Likert scale (1 to 5), the self-reported mean results were for competency 3.11 (±0.676), overall certainty 3.55 (±0.783), and satisfaction score 3.16 (± 0.707). Overall competency and satisfaction level significantly correlated with pre-course scores ($P<0.05$). Eleven participants (60%) reported that they need more training, and 7 (30%) reported an insufficient number of cases or not enough time. Most of the participants (67%) reported problem-based learning as the most preferred teaching method, while 28% preferred real patient practical sessions. 13 residents (72%) confirmed that adding more dedicated training sessions within curriculum and extra courses as the most helpful suggestion to improve their competency level.

INTERPRETATION OF RESULTS

The significant correlation of pre-course scores with competency and satisfaction level among functional urology knowledge and clinical application indicates a gap in resident's experience in functional urology. The higher post-course test score is reflective of the level of competency of chief residents, and the improvement achieved with a 2-day focused course. Despite the development of minimum education standards for urology training, it is unclear whether residents are graduating with the essential skill set particularly for this filed of urology.

CONCLUDING MESSAGE

Institutions need to offer consistent and uniform post-graduate training across all urology sub-specialties to ensure adequate skill acquisition by their final year. These findings highlight the need to integrate more interactive problem-based training sessions and extra-curricular teaching tools into functional urology training curriculum. This may consolidate learner engagement and improve training effectiveness and continuity of care.

FIGURE 1

Table 1: Spearman's Rho Correlation between pre-course score and self-reported assessment variables

Variable	Mean (SD)	Correlation coefficient	*P*-value
Competency level	3.11 (0.676)	0.6301	0.005067*
Certainty	3.55 (0.783)	0.3543	0.1492
Amount of teaching	2.94 (0.802)	0.1459	0.5634
Satisfaction level	3.16 (0.707)	0.5607	0.01549*
Expected Proficiency level after the course	4 (0.594)	0.2051	0.4143

*Statistically significant, p < 0.05; 5- point Likert scale ranging from 1 to 5

FIGURE 2

Table 2: Competency score comparison for each scenario

Diagnosis	Pre-Course (n =18) Mean (SD)	Post-Course (n =18) Mean (SD)	% Change	*P*-value
OAB/UUI	2.69 (0.59)	3.66 (0.61)	36.0595%	<0.001*
Dysfunctional voiding	4.05 (0.96)	5.27 (0.46)	30.1235%	<0.001*
Recurrent UTI	4.05 (1.25)	4.97 (0.69)	22.716%	0.0118*
Nocturia	2.69 (1.49)	5 (1.09)	85.8736%	< 0.001*
Stress Urinary Incontinence	2.19 (0.75)	3 (0.64)	36.9863%	0.0015*
Fistula and other Incontinence	1.22 (0.81)	2.38 (0.50)	95.082%	< 0.001*
Bladder pain syndrome	1.5 (0.70)	2.16 (0.85)	44%	0.0158*
Neurogenic bladder (pathophysiology)	2.72 (1.02)	4.13 (0.63)	51.8382%	< 0.001*
Neurogenic bladder (Management)	1.72 (0.75)	1.94 (0.72)	12.7907%	0.37
PPSUI	2.11 (0.75)	2.83 (0.38)	34.1232%	0.00134*

*Statistically significant, p < 0.05 (t-test); UUI, urge urinary incontinence; OAB, overactive bladder; UTI, urinary tract infection; PPSUI, post prostatectomy stress urinary incontinence

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** McGill University **Helsinki** Yes **Informed Consent** No

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QUALITY OF LIFE IN PATIENTS WITH CHRONIC PROSTATITIS TREATED WITH ELABORATED POLYBACTERIAL VACCINE

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HYPOTHESIS / AIMS OF STUDY

Chronic prostatitis is a condition that greatly deteriorates the quality of life of patients and poses a therapeutic challenge. Following the classification suggested by the National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK) of the National Institutes of Health (NIH), bacterial prostatitis, with confirmed or suspected infection, must be distinguished from chronic pelvic pain syndrome (CPPS). Enterobacteriaceae, especially E. coli, are the predominant pathogens in acute bacterial prostatitis. In chronic bacterial prostatitis, the spectrum of strains is wider (1).

The objective of this study is to know the impact on the quality of life measured through the SF-36 questionnaire in patients receiving a sublingual polybacterial vaccine due to chronic bacterial prostatitis.

STUDY DESIGN, MATERIALS AND METHODS

A prospective study of 100 patients diagnosed of chronic bacterial prostatitis was conducted. Study groups:

* Group A (n = 50): patients receiving Uromune® sublingual vaccine for 3 months plus bromazepam p.o. 1.5 mg q.d. plus extract of Serenoa repens 160 mg b.i.d.;

* Group B (n = 50): patients receiving bromazepam p.o. 1.5 mg q.d. plus extract of Serenoa repens 160 mg b.i.d.

In both groups, antimicrobial treatment was indicated when an episode of acute infection was diagnosed.

Evaluation variables: age, body mass index, rectal examination, clinical records, secondary diagnoses, concomitant treatments, toxic habits, time of evolution of prostatitis, number of exacerbation episodes, positive urine cultures (UC) (+), result in the HRQOL test SF-36 (0 = worst, 100 = best) in the control points (at the beginning of the treatment and in months 3, 9 and 15), follow-up mean time. Descriptive statistics, ANOVA analysis, Student's t test, Fisher's exact test were used; p <0.05 was considered significant.

RESULTS

Mean age for the whole sample was 45.33 years old, median 49 years (range21-73); it was similar in Group A (42.33 years; SD 13.67) and in Group B (49.33 years; SD 11.90) (p = 0.2354).

Mean follow-up time was 19.85 months for the whole sample, median 18 months (range 6-36); it was similar in Group A (19.92 months, SD 9.24) and in Group B (19.83 months, SD 6.01) (p = 0.9793).

There was no difference in clinical records, secondary diagnoses, concomitant treatments, toxic habits between both groups. Table 1 shows the results of the average responses in SF-36 questionnaire at the beginning of the treatment and during the follow-up.

INTERPRETATION OF RESULTS

Chronic bacterial prostatitis is a diagnostic and therapeutic challenge in both urological and primary care settings. Although it might not carry mortality, morbidity in chronic bacterial prostatitis is high, as quality of life's affectation. This study shows the efficacy and benefit of the use of the polybacterial vaccine (Uromune ®) in this specific population. The vaccine favours immunoactive prophylaxis using a suspension of inactivated complete cells of differents strains of Escherichia coli, Klebsiella pneumoniae, Proteus mirabilis and Enterococcus faecalis (25% each). Furthermore, the avoidance of continuous antimicrobial treatment may prevent the appearance of antibiotic-resistant strains in a population that is mainly treated empirically with numerous medical and physical modalities due to the difficulty to detect a causative pathogen (1).

CONCLUDING MESSAGE

The elaborated sublingual polybacterial vaccine is associated with an improvement in the health-related quality of life in patients with chronic bacterial prostatitis. It could be interesting to include Immunoactive prophylaxis in antimicrobial stewardship programmes .

FIGURE 1

SF-36	Beginning	Month 3	Month 9	Month 15
Group A	43	80	80	81
Group B	42	57	53	51
p	1.0000	0.0001	0.0001	0.0001

REFERENCES

1. G. Bonkat (Co-chair), R. Pickard (Co-chair), R. Bartoletti, F. Bruyère, S.E. Geerlings, F. Wagenlehner, B. Wullt Guidelines Associates: T. Cai, B. Köves, A. Pilatz, B. Pradere, R. Veeratterapillay. EAU Guidelines on Urological Infections, 2018. Available at: http://uroweb.org/guideline/urological-infections/

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** IRB Complejo Hospitalario Universitario de Salamanca **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "MALE LOWER URINARY TRACT SYMPTOMS (LUTS) / INCONTINENCE"

LOWER URINARY TRACT SYMPTOMS AFTER ARTIFICIAL URINARY SPHINCTER IMPLANTATION FOR POST-RADICAL PROSTATECTOMY URINARY INCONTINENCE AND ITS RELATION TO PREOPERATIVE URODYNAMIC PARAMETERS

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HYPOTHESIS / AIMS OF STUDY

Artificial Urinary Sphincter (AUS) implantation is regarded as a gold-standard for post-radical prostatectomy urinary incontinence (PRPUI) [1]. However, even after successful placement of AUS, we frequently encounter patients who complain of post AUS lower urinary tract symptoms (LUTS).

The pathophysiology of PRPUI is complicated including various factors. Anatomically compromised urethral sphincter complex, secondary functional changes resultant from neural or vascular damage are responsible for PRPUI. Considering possible impaired contractility, hidden emptying disorder should also be in count. Furthermore patients' old age may also be factors responsible for various types of LUTS after AUS implantation [2]. Therefore, for some patients, only successful redemption of compromised urethral component may not result in completely satisfactory condition.

Plenty of literatures have reported surgical outcome of AUS focusing just on the continence. However, there is little information on the prevalence, predictive risk factors, or long term clinical course on the post AUS LUTS which might be indispensable for preoperative counseling and postoperative management.

For the patients with PRPUI, the usefulness of pre-AUS urodynamic study is controversial. Although some studies have investigated the post AUS storage symptoms regarding preoperative urodynamic parameters, the results were not consistent using arbitrarily dichotomized stratification, diverse definition, and non-standardized 'pad count' as criteria of surgical outcome. According to a recent consensus report, pre-AUS urodynamic study is recommended for patients with noticeable bladder disorder suspicious of low compliance or decreased contractility [3]. However, to notice potential bladder dysfunction ahead of AUS implantation is

not always possible for every PRPUI patient, as incontinence itself may obscure the intrinsic disorder.

In those reasons, we have investigated lower urinary tract symptoms observed after AUS implantation among PRPUI patients. To determine the value of preoperative urodynamic results, we have analyzed post AUS LUTS in association with preoperative urodynamic parameters to find out predictive factor of post AUS LUTS using objectively quantifiable questionnaires.

STUDY DESIGN, MATERIALS AND METHODS

With approval of Institutional Review Board, cases of AUS (AMS 800, American Medical Systems, Minnetonka, MN) implantation performed by a single surgeon from May 2007 to February 2017 were retrospectively evaluated. Only virgin cases of single cuff AUS applied on proximal bulbous urethra, performed after radical prostatectomy, were included in assessment. Cases followed by reoperation or cases with endoscopically proven atrophy or erosion were excluded. And cases with follow up less than 6 months after device activation were also excluded from the assessment. All the patients received urodynamic study before AUS implantation. The urodynamic studies were conducted according to the "Good Urodynamic Practice" suggested by the International Continence Society (ICS). Occlusive cuffs were applied at proximal bulbous urethra. The 61-70cmH2O pressure regulating balloon were placed at pre-peritoneal space. For all the patients, cycling test was performed, after components connection, under urethroscopy to confirm device function and good coaptation. The device was deactivated for 6 weeks, and after activation of device, periodic outpatient assessment was followed. LUTS were assessed using Sandvik-incontinence severity index (Sandvik-ISI), overactive bladder symptom score (OABSS), and international prostate symptom score (IPSS).

RESULTS

Finally, a total of 104 patients were included in investigation. The mean age at AUS implantation was 73.1 (56.6~84.9) years old, the mean follow up length was 45.4 (7.9~118.2) months after AUS implantation. Pre-AUS urodynamic study was performed at mean period of 34.8 (4.0~194.5) months after radical prostatectomy, and AUS implantation was performed at mean period of 38.8 (6.6~195.0) months after radical prostatectomy. The mean age at latest follow up was 79.6 (61.9~93.4) years old.

At the latest outpatient visit, 10.9 % (11/101) had very severe urinary incontinence corresponding to Sandvik-ISI score 12, 51.0 % (53/104) had overactive bladder (OAB) corresponding to OABSS urgency score ≥2 with total OABSS score ≥3. 18.2% (18/99) had severely symptomatic LUTS corresponding to IPSS score ≥ 20 points. 32.7% (34/104) patients were taking medication for treatment of overactive bladder symptoms.

When we analyzed preoperative urodynamic parameters and postoperative symptom scores, maximum cystometric capacity had significant negative correlation with OABSS-urgency (P=0.012, rho=-0.246), detrusor pressure at end-filling had significant negative correlation with IPSS-straining to void (P=0.032, rho=-0.216). Among the voiding phase urodynamic parameters detrusor pressure at peak flow showed significant positive correlation with OABSS-urgency score (P=0.032, rho=0.222). On the other hand, projected isovolumetric pressure (PIP) (PdetQmax+5Qmax) and modified PIP (PdetQmax+Qmax) had no correlation with any item of questionnaires (Table 1). The presence of involuntary detrusor contraction had significant association with OAB; defined as OABSS urgency score more than point 2 with total score more than point 3 (P<0.001), OABSS-urgency (P<0.001) and OABSS-urgency urinary incontinence (P=0.002) (Figure 1).

There was significant correlation between the patient age at latest visit and nocturia (OABSS;P=0.017, rho=0.235, IPSS;P=0.050, rho=0.198), weak stream (IPSS;P=0.048, rho=0.199) and voiding symptoms (IPSS;P=0.044, rho=0.203). However, there was no significant correlation between follow up period after AUS implantation and LUTS scores.

INTERPRETATION OF RESULTS

The bladder compliance itself had no correlation with any item of post AUS LUTS. Close surveillance of the bladder and upper urinary tract condition might be followed after AUS implantation for the patients with low bladder compliance before AUS implantation. As both the Qmax and PdetQmax are related with urethral resistance, to assess the bladder contractility with PIP or modified PIP, calculated using Qmax and PdetQmax, may not be appropriate for the PRPUI patients.

CONCLUDING MESSAGE

After AUS implantation for PRPUI, diverse storage and even voiding symptoms were observed, which were overlooked for a long time. Pre-AUS urodynamic parameters, like detrusor overactivity, small bladder capacity, high detrusor pressure at end-filling could predict the post-AUS LUTS. Therefore preoperative urodynamic evaluation may be valuable for prediction of surgical outcome and counseling the patients prior to AUS implantation. Furthermore, as the population with PRPUI-AUS is in their old age, the aging effect on the lower urinary tract function might also be considered in managing the patients.

FIGURE 1

Table 1. Statistical correlation between pre-AUS urodynamic parameters and post-AUS lower urinary tract symptom scores

Variables	Bladder compliance	Maximum cystometric capacity	Detrusor pressure at end-filling	PdetQmax	Projected isovolumetric pressure (PdetQmax +5Qmax)	Modified projected isovolumetric pressure (PdetQmax +Qmax)
SANDVIK incontinence severity index	-.019	-.086	-.024	-.010	-.053	-.050
OABSS-frequency	.058	.008	-.068	.049	-.012	.026
OABSS-nocturia	-.053	-.143	.014	.047	-.092	-.065
OABSS-urgency	.000	-.246* (P=0.012)	-.119	.222* (P=0.034)	-.148	.051
OABSS-urgency urinary incontinence	.018	-.163	-.090	.147	-.106	.049
OABSS-frequency & nocturia	-.024	-.104	-.011	.065	-.058	-.015
OABSS-urgency & urgency urinary incontinence	003	-.222* (P=0.024)	-.103	.199	-.136	.053
OABSS-total	.015	-.208* (P=0.035)	-.106	.164	-.137	.015
IPSS-feeling of incomplete emptying	.009	-.096	-.055	.108	-.003	.074
IPSS-frequency	.027	-.107	-.081	.071	-.038	-.007
IPSS-intermittency	.009	-.018	-.009	.011	-.049	-.039
IPSS-urgency	-.049	-.192	-.054	.060	-.107	-.072
IPSS-weak urinary stream	.049	-.171	-.142	.024	-.060	.018
IPSS-straining to void	.167	-.077	-.216* (P=0.032)	.078	.018	.060
IPSS-nocturia	.020	-.075	-.030	.037	-.036	-.039
IPSS-voiding symptom	.077	-.107	-.133	.053	-.030	.022
IPSS-storage symptom	-.004	-.148	-.062	.038	-.048	-.057
IPSS-total score	.051	-.140	-.118	.052	-.059	-.018

Statistical analysis was performed with Spearman rank-correlation test; Numbers are correlation coefficient values; *significant at the 0.05 level (2-tailed)

FIGURE 2

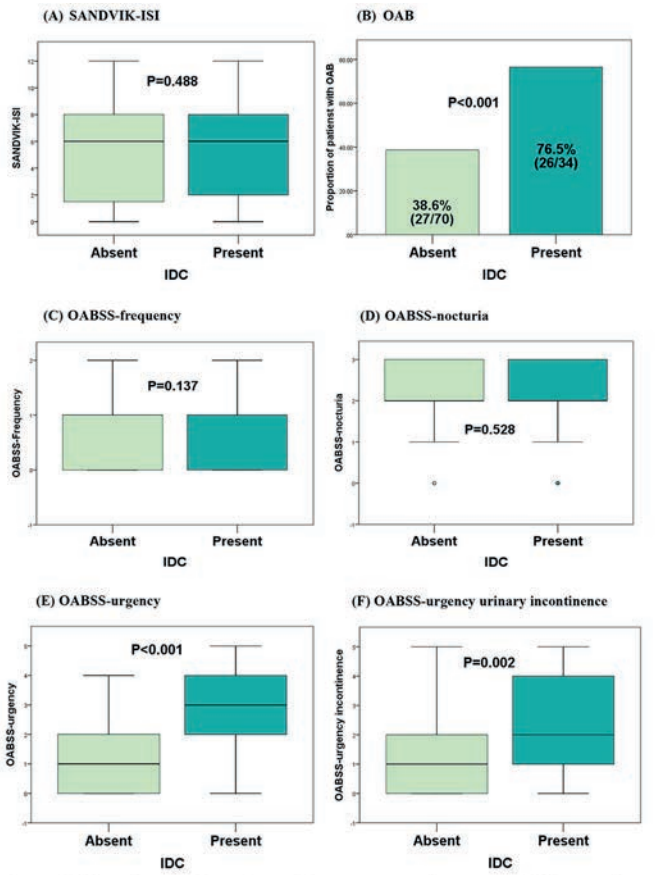

Figure 1. Effect of pre-AUS involuntary detrusor contraction on post-AUS lower urinary tract symptoms Statistical analysis for continuous variables were conducted with Mann-Whitney U test and categorical variables were conducted with Chi-Square test; *significant at the 0.05 level (2-tailed); † OAB was defined as OABSS≥3 with an urgency score ≥2

REFERENCES

1. Crivellaro S, Morlacco A, Bodo G, Agro EF, Gozzi C, Pistolesi D, et al. Systematic review of surgical treatment of post radical prostatectomy stress urinary incontinence. Neurourology and urodynamics. 2015.
2. Heesakkers, J., Farag, F., Bauer, R. M. et al.: Pathophysiology and Contributing Factors in Postprostatectomy Incontinence: A Review. Eur Urol, 71: 936, 2017
3. Biardeau, X., Aharony, S., Campeau, L. et al.: Artificial Urinary Sphincter: Report of the 2015 Consensus Conference. Neurourol Urodyn, 35 Suppl 2: S8, 2016

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AN INDIVIDUAL PATIENT DATA META-REGRESSION FOR CONTINENCE RECOVERY FOLLOWING RADICAL PROSTATECTOMY

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HYPOTHESIS / AIMS OF STUDY

Following radical prostatectomy (RP), urinary incontinence is a predictable consequence, occurring in the majority of patients. The time to achieve continence (continence recovery) after RP is variable. The mechanism for the time dependent recovery of urinary incontinence is not clearly understood. Preoperative patient risk factors that affect continence recovery following RP have been reported. The preoperative length of the membranous urethral length (MUL) which is measured via T2 weighted images and age are two prognostic patient factors that can affect the recovery time to continence following RP. MUL is important because the structure and function of the membranous urethra is inherently associated with the urinary sphincter complex. A comprehensive understanding of prognostic risk factors is potentially of value to clinicians when counselling patients in clinical practice prior to surgery. Our aim was to i) Undertake an individual patient data (IPD) meta-regression for the recovery of continence at 6 and 12 months following RP from studies

reporting prognostic factors, ii) Propose a multivariate logistic model for predicting postoperative continence recovery.

STUDY DESIGN, MATERIALS AND METHODS

The corresponding authors of the 12 studies that were included in our previously published systematic review that examined the effect of MUL on the continence recovery following RP were invited to provide their individual patient datasets comprising i) patient characteristic data including age, prostate volume, MUL measurements ii) continence recovery (defined as no pad usage) at 6 and 12 months following RP. A one-step individual patient data (IPD) logistic meta-regression with a random-effect to control for within-study clustering was undertaken.

RESULTS

Six datasets reporting continence recovery (defined as no pad usage) at 6 months (4747 patients) and 6 datasets at 12 months (5241 patients) were analysed. Patients with a longer MUL ($p<0.001$), younger age ($p<0.001$) or smaller prostate volume ($p\leq0.003$) had significantly higher odds of continence recovery at 6 and 12 months in both the univariate and multivariate models. Although prostate volume was statistically significant, the effect was very small and is likely not to be of clinical significance.Higher Gleason biopsy scores were associated with poorer outcomes in the short term ($p\leq0.022$) but not in the long term ($p\leq0.060$). Using the multivariate model, it is possible to say for example that a 50 year old patient with a 9mm MUL and prostate volume of 35cm3 has a probability of return to continence at 6 and 12 months of 76% and 87% respectively. A 70 year old patient also with a 9mm MUL and a prostate volume of 35cm3 has a 56% and 69% probability of a return to continence at 6 and 12 months respectively.

INTERPRETATION OF RESULTS

A longer preoperative MUL, younger age and a smaller prostate volume are significantly and positively associated with a more rapid return to continence in men following RP. Our logistic modelling results can be translated into practice when counselling patients prior to surgery about the probability of a return to continence at 6 and 12 months following RP. IPD meta-regression provides more appropriate summaries of the effect of predictors as opposed to standard meta-regression analyses that may be subject to ecological bias.

CONCLUDING MESSAGE

A longer preoperative MUL and younger age are patient specific factors that are associated with a more rapid return to continence following RP.

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SAFETY OF HUMAN MESENCHYMAL STEM CELLS (HMSCS) THERAPY AND THEIR SECRETOME IN POST PROSTATECTOMY INCONTINENCE WITH RESIDUAL TUMOR (IN-VITRO MODEL)

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HYPOTHESIS / AIMS OF STUDY

The prevalence of post-prostatectomy incontinence is high due to the increased number of radical prostatectomies, however, the improvement of surgical techniques helped to decrease the incidence. Transurethral injection of stem cells or their secretome have been reported as an effective treatment modality for incontinence in animal models and human clinical trials. Safety with recurrent/residual tumor remains unclear. We aimed to study the role of human mesenchymal stem cells (hMSCs) and their secretome in prostate cancer functionality and survival in-vitro.

STUDY DESIGN, MATERIALS AND METHODS

We gathered the basic information to understand the cytokines profiling of hMSCs, prostate cancer cell lines, LNCaP (androgen responsive) and PC-3 (androgen resistant). We cultured hMSCs ,LNCaP and PC-3 cell lines individually and were maintained in Dulbecco's modified Eagle's medium (DMEM)-low glucose media, supplemented with %10 FBS, Penicillin(100U/ml) and Streptomycin (100U/ml).The cultures were incubated at 37^0C in a humidified atmosphere containing 5% CO2. Cells were passaged and trypsinized at 75-85% confluency. The medium was replenished every three days. After third passage, we collected the conditioned medium (containing cytokines/secretome) of various cell lines after 72 hours. We evaluated 120 Human Cytokine profiling using membrane microarray (RayBio C1000, C-series Human Cytokine Antibody Array.AAH-CYT-1000-8). We used ImageJ to compare the densitometry of each cytokine.

We used 6-well transwell plates to co-culture 1X106 of androgen-responsive prostate cancer cells (LNCaP)/well with hMSCs in different concentrations (0.5:1, 1:1 and 1.5:1) relative to the amount of LNCaP cells. One well was left as a negative control and one well was treated with hMSCs cytokines without cells (72 hours conditioned media). After 48 hours we checked the cell count and morphology of LNCaP cells using Countess II automated cell counter.

Prostate cancer cell lines were cultured in 96-well plates. Cells were treated with hMSCs cytokines (72 hours conditioned media) in dose-variable fashion (0%, 50%, 75% and 100%) for 24 hours. At the end of cell treatments, cells viability were evaluated using MTT proliferation assay. MTT solvent (20microliter) was added to each well and then incubated

3.5 hours at 37^{0}C in a humidified atmosphere containing 5% CO2. The MTT assay is based on the cleavage of the yellow 3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide for to purple formazan crystals by metabolically active cells. Optical densities were measured by using spectrophotometer at wavelengths 590nm and 630nm. The level of significance between control and dose-dependent treatments was determined using analysis of variance (ANOVA) with post hoc Fisher's LSD test. P-value< 0.05 was considered to be statistically significant. We used IBM SPSS v.22 software for statistical analyses.

RESULTS

The differential cytokine profiling is shown in figure 1. Twenty-one cytokines were highly expressed in hMSCs more than 10 times their expression in LNCaP including; IL1 alpha, IL-2, IL-4, IL-6, IL-7, IL-13, IL-16, LIGHT, SDF-1, BDNF, TNF-B, HGF, bFGF, FGF-7, IGFBP-4, GDNF, TGF-B1, MCP-1, MIG, Flt-3 lig. Twenty cytokines were highly expressed in hMSCs about 5-10 times their expression in LNCaP including; IL-1ra, IL-1B, IL15, MCP-2, MCP-3, MCP-4, TGF-B3, MIP-1-delta, Leptin, axl, RANTES, Eotaxin, Eotaxin-3, TIMP-1, PARC, SCF, TARC, GCP-2, Fractalkine, MDC.

Co-culturing of hMSCs and LNCaP cells revealed regression of cancer cell count when co-cultured with equivalent (1:1) or more amount of hMSCs (2XhMSCs: 1XLNCaP). Co-culturing less cell count of hMSCs (0.5 to 1) with LNCaP cells resulted in a higher proliferation of the cancer cells than control. Treating the cancer cells with the secretome revealed marked regression (figure 2a).

After 24 hours of treatment of prostate cancer cells with hMSCs secretome without cells, LNCaP (androgen sensitive) and PC-3 (androgen resistant) cells were evaluated by performing MTT viability assay (Figure 2b). Androgen-sensitive (LNCaP) cells were significantly declined. However, PC-3 cells increased after treatment without reaching statistical significance.

INTERPRETATION OF RESULTS

Radical prostatectomy is usually indicated in early stages of pathological progression, i.e. androgen sensitive tumor. Treatment of post-prostatectomy incontinence using hMSCs cells might be tricky if there is microscopic or macroscopic residual tumor. Our in-vitro results showed that cell therapy resulted in variable responses when co-cultured with androgen-sensitive cancer cells (LNCaP). Interestingly, secretome alone without cells might control the environment around the cancer cells leading to stabilization of tumor progression.

We are the first to explore the differential expression in the cytokines between hMSCs and prostate cancer cells. Studying of the differential expression in the cytokines may lead to understanding the suppressor signaling pathway. Regenerative cytokines as TGF-B and SDF-1 were highly expressed in hMSCs secretome while they are known to help in regeneration of injured sphincter complex. Anti-tumor cytokines as IL2, IL6 and IL15 were highly expressed in the secretome than LNCaP cells. hMSCs may have a potential role in the immunomodulatory pathway through enhancing M1 over M2 activity to limit cancer progression. Our future research will focus on translating the experiment to in vivo model and to understand the complex healthy microenvironment and checkpoints that can regenerate the tissue without tumor progression.

CONCLUDING MESSAGE

Our in-vitro cell culture results revealed that hMSCs secretome (not the cells) resulted in significant suppression of the growth of androgen-sensitive prostate cancer cell line (LNCaP cells). This might support its safety and provide an additional advantage for hMSCs secretome over the hMSCs cells in future regenerative applications (e.g. post-prostatectomy incontinence). Understanding the involved signaling cascade between hMSCs and cancer cells may help patients with risk of cancer progression.

FIGURE 1

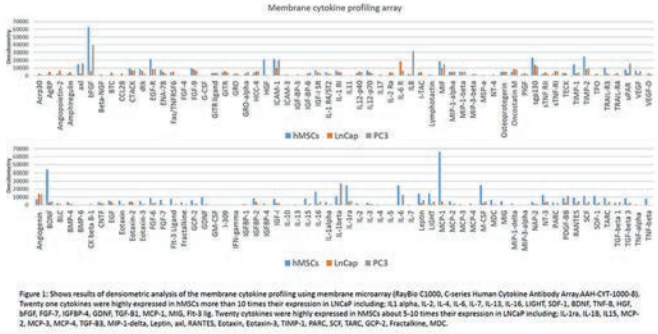

Figure 1: Shows results of densiometric analysis of the membrane cytokine profiling using membrane microarray (RayBio C1000, C-series Human Cytokine Antibody Array;AAH-CYT-1000-8). Twenty one cytokines were highly expressed in hMSCs more than 10 times their expression in LNCaP including; IL1 alpha, IL-2, IL-4, IL-6, IL-7, IL-13, IL-16, LIGHT, SDF-1, BDNF, TNF-B, HGF, bFGF, FGF-7, IGFBP-4, GDNF, TGF-B1, MCP-1, MIG, Flt-3 lig. Twenty cytokines were highly expressed in hMSCs about 5-10 times their expression in LNCaP including; IL-1ra, IL-1B, IL15, MCP-2, MCP-3, MCP-4, TGF-B3, MIP-1-delta, Leptin, axl, RANTES, Eotaxin, Eotaxin-3, TIMP-1, PARC, SCF, TARC, GCP-2, Fractalkine, MDC.

FIGURE 2

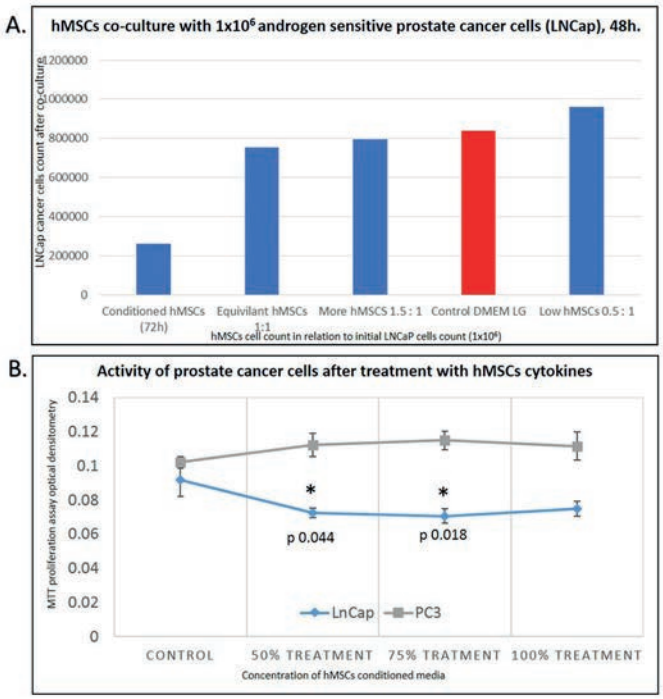

Figure 2: A. Shows the effect of co-culturing hMSCs with 1X10^6 LNCaP cells. We used 6-transwell plate. 1X10^6 LNCaP cells were added to each base well. hMSCS were added to the transwells in different concentrations 1X10^6 (1:1), 1.5X10^6 (1.5:1) and 0.5X10^6 cells (0.5:1). We added conditioned media of 72h. cultured hMSCs into another transwell without cells. One transwell was left as a control with the usual media (DMEM LG). Secretome/conditioned-media (without cells) inhibited the growth of LNCaP cells. B. Shows the results of dose dependent treatment of cancer cells using the hMSCs secretome (conditioned media after 72h.). LNCaP cell activity was significantly arrested.

Funding None **Clinical Trial** No **Subjects** None

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CONTEMPORARY TRENDS OF RADICAL PROSTATECTOMY AND PREDICTORS FOR THE RECOVERY OF URINARY CONTINENCE IN THE ELDERLY AGED OVER 70 YEARS: COMPARISONS OVER 12 YEARS WITH THE COHORT AGED 70 YEARS OR LESS

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HYPOTHESIS / AIMS OF STUDY

While advances in surgical techniques and modalities seem to facilitate recovery of urinary continence (UC) after radical prostatectomy (RP), old age is still considered as a risk factor for delay or failure to achieve UC and many older men with a significant disease often hesitate to receive RP due to the risk of urinary incontinence. We aimed to evaluate the contemporary trends of RP in the elderly aged over 70 years and compare its predictors for the recovery of UC over time with those for patients aged 70 years or less.

STUDY DESIGN, MATERIALS AND METHODS

Among men who underwent RP in our institution, a total of 2,301 men with eligible criteria were included in the analyses. Patients were divided into two groups based on age at surgery (>70 vs ≤70) and four study periods by surgery year (2004-2006, 2007-2009, 2010-2012, and 2013-2015). Clinicosurgical characteristics of both age groups were compared according to the study period and the recovery rate of UC at 3 and 12 months after RP was compared between both groups by the study period. Multivariate logistic regression analyses were performed to identify the predictors for the recovery of UC in each age group and the effects of each predictor on the recovery of UC at 12 months were compared over time between both age groups.

RESULTS

Of the entire cohort, patients aged >70 years accounted for 26.5% (610/2,301) and gradually increased over time up to 30.0% in 2013-2015 (P <0.001). While the use of robot-assisted RP increased over time in each age group, older patients received robot-assisted RP 8.3% lower than younger patients in the last quarter of the study period (P = 0.003). Within older patients, the rate of robot-assisted RP and neurovascular bundle (NVB) saving continued to rise up to 80.0% and 67.4% in 2013-2015 and pathologic Gleason score became higher over the study period. On the other hand, prostate volume and membranous urethral length (MUL) significantly decreased over the study period. While the recovery rate of UC significantly improved over time in each age group, overall recovery rate of UC at 12 months (3 months) in patients aged >70 years was lower than that in those ≤70 years (81.5% (52.6%) vs 88.6% (60.9%); P <0.001, respectively). However, from the second quarter of the study period, the difference of recovery rate at 12 months between both age groups significantly decreased over time (P <0.001), whereas the gap at 3 months was constant over the study period (Fig. 1). Among younger patients, age at surgery, robot-assisted RP, prostate volume, and MUL were founded to be the predictors for the achievement of UC at both 3 and 12 months, and NVB saving only for the recovery at 12 months. In contrast, only age and MUL were revealed to be the predictors for the achievement of UC at 3 and 12 months in patients aged >70 years (Table 1).

INTERPRETATION OF RESULTS

There has been an increasing trend of the proportion of subjects aged >70 years among the patients who received RP over the last 12 years. While several clinicosurgical characteristics such as NVB saving and robot-assisted RP are associated with the recovery of UC in younger patients, only age and MUL are the predictors for the recovery in those aged > 70 years.

CONCLUDING MESSAGE

Based on our contemporary RP series, the proportion of patients aged >70 years gradually increased up to 30.0% over 12 years, and the use of robot-assisted RP and NVB saving was also expanded in this population. Although the recovery rate of UC at 3 and 12 months significantly improved over time in patients aged >70 years, it was still lower than that in younger patients. Unlike younger patients, only age and MUL were the predictors for the recovery of UC in those aged >70 years.

FIGURE 1

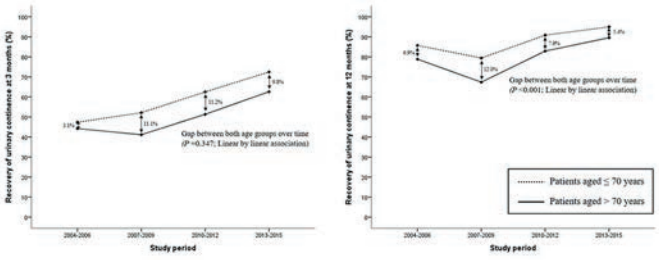

Fig. 1. Changes of the recovery rate of urinary continence at 3 and 12 months after RP over time

FIGURE 2

Table 1. Multivariate logistic regression analyses of the clinicosurgical variables predicting the recovery of urinary continence at 3 and 12 months in each age group

	Recovery of continence at 3 months		Recovery of continence at 12 months	
	Odds ratio (95% CI)	*P* value	Odds ratio (95% CI)	*P* value
Patients aged ≤70 years				
Age	0.96 (0.94-0.97)	**<0.001**	0.94 (0.90-0.97)	**<0.001**
Charlson comorbidity index		0.267		**0.017**
1 vs 0	0.82 (0.64-1.05)		0.70 (0.49-1.01)	
≥2 vs 0	0.88 (0.54-1.44)		0.47 (0.25-0.86)	
Surgical approach (robot-assisted)	1.64 (1.31-2.04)	**<0.001**	1.67 (1.21-2.32)	**0.002**
Prostate volume	0.99 (0.98-1.00)	**0.039**	0.99 (0.98-0.99)	**0.009**
Membranous urethral length	1.08 (1.05-1.12)	**<0.001**	1.08 (1.03-1.14)	**0.003**
NVB saving	1.20 (0.95-1.51)	0.123	1.41 (1.01-1.98)	**0.044**
Patients aged >70 years				
Age	0.92 (0.84-0.99)	**0.041**	0.89 (0.80-0.99)	**0.026**
Charlson comorbidity index		**0.034**		
1 vs 0	0.64 (0.43-0.94)			
≥2 vs 0	0.59 (0.32-1.10)			
Surgical approach (robot-assisted)	0.99 (0.68-1.44)	0.967	1.33 (0.84-2.12)	0.224
Membranous urethral length	1.17 (1.10-1.24)	**<0.001**	1.18 (1.10-1.28)	**<0.001**
NVB saving	1.10 (0.77-1.56)	0.607	1.27 (0.82-1.98)	0.286

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** The Institutional Review Board of Seoul National University Bundang Hospital **Helsinki** Yes **Informed Consent** No

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THE VIRTUE EUROPEAN TRIAL FOR URINARY INCONTINENCE AFTER PROSTATECTOMY: INTERMEDIATE 1-YEAR OUTCOMES

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HYPOTHESIS / AIMS OF STUDY

Fourteen tertiary reference centers for male urinary management participated to a prospective 3-year trial (ClinicalTrials.gov NCT01608789) about post radical prostatectomy urinary incontinence treatment with the Virtue® male sling (Coloplast A/S, Humlebaek, Denmark). Virtue® Male Sling System (figure #1) is a quadratic large pore, knitted polypropylene sling with four transobturator and prepubic arms providing a proximal relocation and perineal compression of the urethra (1). This work evaluates intermediate 12-month efficacy and safety data.

STUDY DESIGN, MATERIALS AND METHODS

One hundred and eighteen patients (ITT population) were included from August 2012 to February 2015 (including device run-in subjects). Patients with predominant overactive bladder, previous incontinence surgery, urethral stricture, or radiation history were excluded. Objective success, as primary endpoint, was defined as >50% decrease in 24 hour Pad Weight Test and subjective success, as secondary endpoint, was defined as patient global improvement reported using the PGI-I index (Patient Global Impression of Improvement Index). The International Consultation on Incontinence Questionnaire short form (ICIQ-SF) was also completed. Subgroups were analyzed by baseline severity incontinence on 24 hour Pad Weigh Test: mild (<100g), moderate (100-400g) and severe (> 400g) and Body Mass Index. Evaluation was performed at 1, 3, 6, 12, 24 and 36 months. Uroflowmetry (Qmax) and postvoid residual urine volume (PVR) were systematically measured. Adverse events related to the device or the procedure (AE) were reported.

RESULTS

At the baseline, the mean population age was 66,5 ± 6,7 years. Preoperatively mild, moderate and severe incontinence were 53 (46%), 47 (41%) and 15 (13%) respectively (3

Missing Data). Low, normal and over weighted patients were 36 (31%), 59 (52%) and 19 (17%) respectively (4 MD). The mean and median urinary loss were 227 g ± 292 (5-1471g) and 120 g (45-300) respectively. At 12 months, objective and subjective successes were achieved in 73% and 78% (24,7% very much better; 40% much better) respectively. Mean and median urinary leakage in 24 hour Pad Weigh Test were 79 g ± 142 and 12,5 g (0-90) respectively. Median ICIQ-UI SF score (Internatiunal Consultation on Incontinence Questionnaire - Urinary Incontinence Short Form) decreased from 16 (mean 14,9; range 6-21) to 10 (mean 10,1; range 0-21). The data over the time are presented in table 1. There is no significant degradation of assessed parameters registered from 3 to 12 months follow up. No difference per baseline incontinence severity and Body Mass Index were found. No significant change on Qmax (from 20,6 to 23,9 ml/s) and Post-Void Residual volume (from 5 to 13,7 ml) were reported. Main post operative adverse events were perineal pain (13; 11%), scrotal pain (10; 8,5%), groin pain (10; 8,5%), 10 (8,5%) of whom required medical treatment, genital paresthesia (7; 5,9%), transient urinary retention (8; 6,8%), urgency (12; 10,2%) and hematoma (4; 3,4%).

INTERPRETATION OF RESULTS

The Virtue quadratic male sling is a safe and efficacious treatment for urinary incontinence after radical prostatectomy. Primary results showed no difference according to incontinence severity and BMI.

CONCLUDING MESSAGE

These data should be confirmed in the 3-year follow-up.

FIGURE 1

FIGURE 2

Table 1.

	Baseline	M3	M6	M12
ITT population (n)	118	111	103	96
Mean and median urinary loss in PWT with SD, range (g)	227±292 (5-1471) 120 (45-300)	71,5±145 (0-1009) 10 (1-70)	64±135 (0-880) 18 (0-57)	79±142 (0-800) 12,5 (0-90)
>50% reduction PW in 24HPWT (%)	-	78	80	73
PGI-I (very much, much, little better %)	-	85	83	78
PW <1.3g (% dry per ICS definition)	0	26	27	30
Mean and median ICIQ score with SD, range (0-21)	14,9±3,2 (6-21) 16 (13-17)	9,2±5,8 (0-21) 9 (6-13)	9,1±5,6 (0-21) 9 (5-13)	10,1±5,9 (0-21) 10 (6-14)

REFERENCES

1. Comiter C, Rhee Y, Tu LM, Herschorn S and Nitti V.The Virtue sling – A new quadratic sling for postprostatectomy incontinence – results of a multinational Clinical TrialUrology. 2014 Aug;84(2):433-9.

Funding Coloplast **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov NCT01608789 **RCT** No **Subjects** Human **Ethics Committee** Hospital Universitario Puerta del mar Ethical committee, Cadiz on 27/09/2013 **Helsinki** Yes **Informed Consent** Yes

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URODYNAMIC QUANTIFICATION BEFORE ROBOT-ASSISTED RADICAL PROSTATECTOMY TO IDENTIFY FACTORS THAT AFFECT PRE-OPERATIVE URETHRAL FUNCTION IN MALES

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HYPOTHESIS / AIMS OF STUDY

Stress urinary incontinence (SUI) is one of the complications of radical prostatectomy. Although pre-operative urethral function has been associated with the incidence of post-operative SUI [1], it remains unclear as to what affects pre-operative urethral function in males. We investigated the association between clinical factors and pre-operative urethral function in male patients, using the urethral pressure profile test.

STUDY DESIGN, MATERIALS AND METHODS

We assessed 313 patients who had undergone robot-assisted radical prostatectomy (RARP) between April 2013 and March 2015. Patients receiving neoadjuvant hormonal therapy were excluded. Urethral pressure profiling was performed before, and 3 months after the surgery, in all patients. Baseline patient characteristics were collected from clinical records. Univariate and multivariate analyses were performed to investigate the association between pre- and post-operative maximum urethral closure pressure (MUCP) and the

following factors: age, body mass index, American Society of Anesthesiologists (ASA) physical status, history of diabetes mellitus and hypertension, prostate volume, international prostate symptom score, erectile function (EF) domain score of the International Index of Erectile Function (IIEF-15), and current medication, such as calcium channel blockers, α-adrenoceptor blockers, angiotensin receptor blockers, and angiotensin converting enzyme inhibitors.

RESULTS

A total of 187 patients (mean age, 66 ± 6 years) were enrolled. Mean pre-operative MUCP was 83.5 ± 23.2 cmH2O. Univariate analysis revealed that age (70 years), larger prostate volume (40 mL), higher IIEF-EF domain (< 13), and the use of calcium channel blockers, were significantly associated with pre-operative MUCP (p = 0.009, 0.003, 0.003, and 0.003, respectively). Following multivariate analysis, these factors were found to be significantly associated with pre-operative MUCP (odds ratio [OR] 0.40, 95% confidence interval [CI] 0.19–0.83, p = 0.01; OR 0.29, 95% CI 0.13–0.62, p = 0.001; OR 0.33, 95% CI 0.16–0.69, p = 0.003; OR 0.34, 95% CI 0.16–0.69, p = 0.003, respectively). Mean post-operative MUCP was 56.0 ± 17.0 cmH2O, with a pre- to post-operative reduction rate of 18%. Univariate analysis revealed that age (70 years) and pre-operative MUCP (< 80 cmH2O) were significantly associated with post-operative MUCP (p = 0.01 and p < 0.001, respectively). In multivariate analysis, only pre-operative MUCP (<80 cmH2O) was significantly associated with post-operative MUCP (OR 4.28, 95% CI 2.28–8.04, p < 0.001).

INTERPRETATION OF RESULTS

The current study indicated that older age, larger prostate volume, worse erectile function, and medication with calcium channel blockers, were significantly associated with worse pre-operative urethral function. Since it is known that chronic ischemia is a contributing factor to the pathogenesis of benign prostate hyperplasia and erectile dysfunction [2], it is possible that impaired urethral function also attributes to the decreased urethral blood supply. Additionally, since calcium channels have been identified in the human urethral rhabdosphincter, calcium channel blocker medication inhibiting channel function might worsen urethral function.

CONCLUDING MESSAGE

Our study has demonstrated that older age, larger prostate volume, worse erectile function, and calcium channel blockers are significantly associated with low pre-operative MUCP. These factors could represent predictive markers for post-operative SUI.

FIGURE 1

Multivariate Analysis of Clinical Parameters for pre-operative Maximum Urethral Closure Pressure

	Odds Ratio	95% Confidence Intervals	*P*-value
Age (≧70 vs. < 70 years)	0.40	0.19 – 0.83	0.01
Prostate Volume (≧40 vs. < 40 mL)	0.29	0.13 – 0.62	0.001
IIEF-EF domain* (<13 vs. ≧13)	0.33	0.16 – 0.69	0.003
Calcium Channel Blocker (yes vs. no)	0.34	0.16 – 0.69	0.003

*erectile function domain score of International Index of Erectile Function 15

REFERENCES

1. Dubbelman YD, Groen J, Wildhagen MF, Rikken B, Bosch JL. Urodynamic quantification of decrease in sphincter function after radical prostatectomy: relation to postoperative continence status and the effect of intensive pelvic floor muscle exercises. Neurourol Urodyn 2012; 31(5): 646-51.
2. Berger AP, Deibl M, Leonhartsberger N, Bektic J, Horninger W, Fritsche G et al. Vascular damage as a risk factor for benign prostatic hyperplasia and erectile dysfunction. BJU Int 2005; 96(7): 1073-8.

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** The ethics committee of Nagoya University Graduate School of Medicine **Helsinki** Yes **Informed Consent** No

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EVALUATION OF TRANSURETHRAL RESECTION OF THE PROSTATE IN MEN WITH DETRUSOR UNDERACTIVITY: IS IT A VIABLE TREATMENT OPTION?

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HYPOTHESIS / AIMS OF STUDY

Voiding symptoms in men, such as a poor voiding stream, prolonged bladder emptying and increased post-void residual may be the result of bladder outlet obstruction (BOO) due to benign prostatic obstruction (BPO) or impaired bladder contractility due to detrusor underactivity (DU) (1). A pressure-flow study is the only method to distinguish between BPO and DU. In patients with BPO, transurethral resection of the prostate (TURP) is performed, but many urologists hesitate to perform a TURP in patients with DU since clinical improvement may be poor and surgery bears considerable risks. The question is: is this hesitation justified? The aim of this study was to compare clinical outcomes after TURP in men with and without DU using the Hannover-Maastricht (HM)-nomogram, a BOO-dependent bladder contractility nomogram (2). To our knowledge this is the first clinical re-

port of men with and without DU treated with TURP using the HM-nomogram for categorization of bladder contractility.

STUDY DESIGN, MATERIALS AND METHODS

In this retrospective analysis we studied men treated with TURP for refractory voiding symptoms between 2010 and 2016. A total of 394 of these men underwent a preoperative pressure-flow study (PFS). In our final analysis we only included patients with a reliable preoperative PFS, a pre- and postoperative maximum flow rate (Qmax) and pre- and postoperatively measurement of post-void residual (PVR) (n=80). Bladder outlet obstruction index (BOOI) and maximum Watt factor (Wmax) were calculated by the software (MMS) of the PFS . Patients were plotted in the HM-nomogram and categorized in the group with DU (<25th percentile group) and without DU (the >25th percentile group). Clinical outcomes were measured by comparing pre- and postoperative Qmax and PVR. Catheterization rates were calculated pre- and postoperatively in both groups, but irrespective of method of catheterization.

Different TURP methods used in our hospital included: GreenLight™ laser vaporization, 980-nm diode laser vaporization and electrosurgical TURP. The choice for electrosurgical TURP was the inability to visualize the ureteral orifices. Patients with presence of a large prostatic midlobe were mostly treated with 980-nm diode laser vaporization. All other patients were treated with GreenLight™ laser vaporization. Statistical analysis was performed using a Mann-Whitney U test and Chi-square test using SPSS version 23.

RESULTS

Baseline data of preoperative pressure-flow studies of men with or without detrusor underactivity are shown in table 1. Clinical outcomes before and six weeks after TURP are shown in table 2. Pre- and postoperative catheterization rates are shown in table 3.

Postoperative Qmax increased dramatically after TURP in men with and without DU, but was not significantly affected by the method of TURP (p=0.36). However, patients who underwent a 980-nm diode laser vaporization had a significantly higher postoperative PVR (33ml (10-70)) than GreenLight™ laser vaporization (11ml (0-40)) and electrosurgical TURP (0ml (0-42)) (p=0.02).

INTERPRETATION OF RESULTS

This is the first clinical report on TURP in men with and without DU using the HM-nomogram for categorization of bladder contractility. At baseline cystometric capacity, voided volume, Qmax, PVR, voiding efficiency, first desire, BCI and Wmax were significantly different between men with and without DU. Age, BOOI, pDetQmax and voiding time did not differ significantly between both groups. Except for age, Qmax and voided volume these data are in line with previously published data on the HM-nomogram (2). An explanation for the differences of our findings and previous work (2) may be that a selection bias occurred towards patients with more severe symptoms requiring a pressure-flow study and/or desobstructive prostate surgery.

In both groups postoperative Qmax improved, PVR and the need for catheterization decreased, without significant differences between men with and without DU. Since we only included men with a reliable preoperative PFS, pre- and postoperative Qmax and PVR, there might also have been a selection bias towards patients with a less severe form of DU, because patients with missing data of Qmax and PVR were excluded from analysis.

CONCLUDING MESSAGE

In this retrospective analysis, TURP for refractory voiding symptoms leads to improvement of the Qmax, reduction of the PVR and the catheterization rate in patients with and without detrusor underactivity. Therefore TURP should also be considered as a viable treatment option in patients with detrusor underactivity.

FIGURE 1

Table 1. Baseline data of pressure-flow studies of men with detrusor underactivity (<25th percentile group) and without detrusor underactivity (the >25th percentile group) (median + interquartile range). Statistical analysis was done with Mann-Whitney U test with statistical significance: * p<0.05, ** p<0.001.

	<25th percentile n=50	>25th percentile n=30	p-value
Age (years)	70 (63-77)	65 (63-74)	0.244
Cystometric capacity (ml)	479 (327-551)	322 (246-386)	0.001*
Voided volume (ml)	160 (99-238)	228 (156-301)	0.032*
Qmax (ml/s)	8.0 (5.7-10.1)	9.6 (7.5-12.5)	0.029*
Postvoid residual (ml)	200 (87-384)	103 (30-140)	0.002*
Voiding efficiency (%)	44 (25-67)	75 (60-96.2)	0.000**
Voiding time (s)	98 (62-127)	74 (48-104)	0.078
First desire (ml)	298 (172-436)	226 (144-292)	0.032*
pDetQmax (cm H_2O)	59 (44-84)	66 (52-87)	0.340
BOOI	52 (34-71)	49 (32-73)	0.870
BCI	85 (72-114)	111 (89-140)	0.003*
Wmax (W/m²)	8.8 (6.7-11.2)	16.1 (12.4-21.7)	0.000**

FIGURE 2

Table 2. Clinical outcomes before and six weeks after TURP of men with detrusor underactivity (<25th percentile group) and without detrusor underactivity (the >25th percentile group) (median + interquartile range). Statistical analysis was done with Mann-Whitney U test with statistical significance: * p<0.05.

	<25th percentile n=50	>25th percentile n=30	p-value
Qmax preoperative	8.0 (5.7-10.1)	9.6 (7.5-12.5)	0.029*
Qmax postoperative	17.9 (11.5-22.7)	18.9 (14.5-27.0)	0.147
PVR preoperative	200 (87-384)	103 (30-140)	0.002*
PVR postoperative	18 (0-66)	6 (0-31)	0.146

Table 3. Percentage of patients who perform any form of catheterisation pre- and postoperatively. Statistical analysis was done with Chi-square test with statistical significance: * p<0.05.

	<25th percentile n=50	>25th percentile n=30	p-value
Need for catheterisation preop (%)	19/50 (38%)	5/30 (16.7%)	0.044*
Need for catheterisation postop (%)	2/50 (4%)	1/30 (3.3%)	0.879

REFERENCES

1. Abrams P, Cardozo L, Fall M, et al. The standardisation of terminology of lower urinary tract function: Report from the standardisation sub-committee of the international continence society. American Journal of Obstetrics and Gynecology 2002; 187:116-126.
2. Oelke M, Rademakers K, van Koeveringe G. Unravelling Detrusor Underactivity: Development of a Bladder Outlet Resistance – Bladder Contractility Nomogram for Adult Male Patients With Lower Urinary Tract Symptoms. Neurourology and Urodynamics 2016; 35:980-986.

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics not Req'd** Retrospective analysis and data were anonymized **Helsinki** Yes **Informed Consent** No

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BEST IN CATEGORY PRIZE "URETHRA MALE / FEMALE"

AGING ASSOCIATED UNDERACTIVE BLADDER INVOLVES A DECREASE IN URETHRAL SEROTONIN RELEASED BY 5HT-EXPRESSING CELLS. AN EXPERIMENTAL STUDY IN RAT.

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1. Fmup & I3s-Ibmc, 2. CHSJ, 3. Fmup & I3s-Ibmc & Chsj

HYPOTHESIS / AIMS OF STUDY

Several studies have shown that the sensation of urine flow through the urethra potentiates bladder contractility. The encoding process of urine flow is still unclear but may involve the rich sensory network of the sub-epithelium of the urethra and the cross-talk between these sensory fibres and ciliated neuronal like cells scattered along the urethral epithelium. These neuronal-like cells may express acetylcholine and serotonin (5HT) while sensory fibres in the sub-epithelium express nicotine receptors and 5-HT2 and 5-HT3 receptor subtypes.

Recent observations showed that topical application of 5HT to the urethra enhances the amplitude of bladder contractions and decreases the volume threshold to reflex bladder contractions.

Therefore, in the present study we hypothesized that the aging process involves a decrease in the number of 5HT-expressing urethral cells and 5HT stimulation of urethral afferents can improve the efficiency of bladder voiding contractions in the aged animals.

STUDY DESIGN, MATERIALS AND METHODS

A group of female Wistar rats with 18-24 months (aged group) were perfused fixed and the urethra removed for immunohistochemistry analysis against 5HT. The number of 5HT immunoreactive (IR) cells were counted in 10 sections. The same procedure was repeated with a group of female Wistar rats with 5-6 months (control group).

A second group of old female Wistar rats, 18-24 months, were anaesthetised and cystometries, with saline infusion through the bladder dome, were performed to evaluate the bladder voiding efficiency. Whenever a reduced frequency was observed, the efficacy of myogenic contractions was confirmed upon serosa topical application of acetylcholine (1 µM) or ATP (5 mg/kg). The same procedure was repeated in young, 5-6 months, female Wistar rats (control group).

Aged Wistar rats, 18-24 months, were anaesthetised and cystometries performed with infusion of saline or 5HT solution (100 microM) through the bladder dome to evaluate the frequency of reflex contractions and the bladder voiding efficiency (voided volume/voided volume+post-void residual urine).

A fourth group of aged female Wistar rats,18-24 months, were anaesthetised and isovolumetric cystometries were performed after gentle clamping of the bladder neck, with the bladders filled at 75% of their maximal bladder capacity. During cystometries, the urethra was irrigated first with a saline solution and then with a 5HT solution at 100 microM. The same procedure was repeated with a group of young, 5-6 months, female Wistar rats (control group).

Values are presented as mean ± standard deviation. Two tailed unpaired t-test was used to compare mean values of two groups.

RESULTS

The aged group presented 90.40 ± 10.92 5HT-IR cells while the young control group presented 182.5 ± 25.47 5HT-IR cells (P=0,0087).

The aged females had 0.26 ± 0.14 bladder contractions/minute while females of control group had 0.55 ± 0.11 bladder contractions/minute (P<0.0004).

Bladder voiding efficiency in aged rats was 49 ± 3%. while in young controls was 78 ± 2% (p<0,0001). The infusion of 5HT did not change the frequency of bladder contractions of the aged group (0.38 ± 0.15 bladder contractions/minute, P=0.15). However, 5HT infusion improved bladder voiding efficiency of the aged group from 49 ± 3% to 77 ± 7% (P<0.0001).

In aged animals with the bladder filled at 75% of maximal bladder capacity, isovolumetric cystometries measured a constant pressure of 19.45 ± 5.15 cm H2O. Urethral irrigation with saline had no detectable effect on bladder pressure. The infusion of the 5HT solution, in contrast, immediately triggered strong bladder contractions with a peak pressure of 46.85 ± 11.95 cm H2O. The same experiment carried out in young animals gave the same results. Saline infusion of the urethra did not cause any change in the isovolumetric recorded bladder pressure (20±2.5 cmH2O). Urethral irrigation with 5HT immediately evoked bladder contractions at a mean pressure of 35 ±8.6 cmH2O.

INTERPRETATION OF RESULTS

In female rats, ageing is associated with a decreased in the number of 5HT-IR cells. Aged female rats had a low bladder voiding efficiency that was corrected to the values of young animals by the urethral perfusion with 5HT solution. Moreover, 5HT irrigation of the urethra triggered strong bladder contractions, indicating the existence of a urethral-vesical reflex mediated be 5HT.

CONCLUDING MESSAGE

If a decrease in 5HT associated with aging is confirmed in the urethras of humans with idiopathic underactive bladder, 5HT administration to the urethra could improve bladder voiding efficiency and improve LUTS associated with underactive bladder.

Funding No fund **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** ORBEA

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BEST NON-CLINICAL ABSTRACT

THERAPEUTIC POTENTIAL OF HUMAN ADIPOSE-DERIVED STEM CELL EXOSOMES IN STRESS URINARY INCONTINENCE – AN IN VITRO AND IN VIVO STUDY

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HYPOTHESIS / AIMS OF STUDY

Stress urinary incontinence (SUI) is a common and annoying medical condition affecting millions of women around the world. Despite the common use of mid-urethral sling surgery, this procedure is associated with a high level of complications, and therefore, there is a need for new medical treatment options. Stem cell-based therapy has gained attention as a promising treatment for SUI. Meanwhile, an increasing number of studies demonstrate that the paracrine effect rather than the stem cell differentiation is the main factor resulting the therapeutic effect. Exosomes are 40- to 150-nm-sized nanoparticles originating from multivesicular bodies (MVBs) and important paracrine effectors in intercellular communication. They function by transferring proteins and genetic materials to target cells. Recent studies have reported that exosomes secreted by adipose tissue-derived stem cells (ADSCs) show potential in tissue regeneration and protection, including bone, muscle, skin, and brain tissue, which support that theory. We hypothesized that ADSCs-derived exosomes could be effective in treating SUI by promoting tissue regeneration after injury. Here, we utilized exosomes derived from human ADSCs and investigate whether it can facilitate recovery after SUI by in vitro and in vivo studies.

STUDY DESIGN, MATERIALS AND METHODS

For the in vitro study, a Cell Counting Kit-8 (CCK-8) array and proteomic analysis were performed. CCK-8 array was intervened with control culture medium and culture medium containing different concentrations of exosomes (0.05, 0.5, and 5 μg/ml) for 72 hours. The exosome proteins were determined by a high-performance liquid chromatography (HPLC) system and then the data were conducted by GO analysis and KEGG pathway analysis. For the in vivo study, female rats were divided into four groups: sham, SUI, ADSC and exosomes (n = 12 each). The SUI model was generated by pudendal nerve transection (PNT) and vagina dilation (VD). One hour after the establishment of the animal model, vehicle, hADSCs, and exosomes were respectively injected into the peripheral urethra. After 2, 4, and 8 weeks, the rats underwent cystometry (CMG) and leak point pressure (LPP) testing, and tissues were harvested for histology and immunofluorescence analyses.

RESULTS

The CCK-8 experiment demonstrated that ADSC-derived exosomes could significantly enhance the growth of skeletal muscle and Schwann cell lines in a dose-dependent manner compare to control medium ($P<0.05$). The proteomics analysis of the exosome identified 1466 proteins that are implicated in various cell functions and pathways. KEGG pathway analysis found two hundred twenty-two different pathways were linked to the exosomes. Some of these proteins are associated with the PI3K-Akt, Jak-STAT, and Wnt pathways that are related to skeletal muscle and nerve regeneration and proliferation. For CMG and LPP testing, bladder capacity (BC) and LPP remained stable at 2, 4, and 8 weeks post-injection in the sham and SUI groups. In the hADSC and exosome groups, the BC and LPP values increased gradually at 2, 4, and 8 weeks post-injection. At each time point, BCs and LPPs of both groups were statistically significant compared with the SUI group ($P < 0.05$). Histological study showed that the proportion of striated muscle in the urethra of SUI group was significantly decreased compared to that in the sham group. In the hADSC and exosome groups, the proportion of striated muscle increased continuously at 2, 4, and 8 weeks post-injection. At each time point, the proportion of striated muscle of both groups were statistically significant compared with the SUI group ($P < 0.05$). IF study showed that striated muscle and peripheral nerves of SUI rats were significantly fewer than those of the sham group after eight weeks of injection,. On the contrary, the ADSC and Exosome groups showed similar amount of striated muscle and peripheral nerves compared to the sham group.

INTERPRETATION OF RESULTS

In vitro studies showed that hADSCs-derived exosomes could significantly enhance the growth of skeletal muscle and Schwann cell lines, and is likely to affect through pathways such as PI3K-Akt, Jak-STAT, and Wnt pathways. In vivo experiments illustrated that exosome derived from hADSCs could improve the urethral function and promote regeneration of striated muscle fiber and peripheral nerve fiber in the urethra of SUI rats. Thus, it is assumed that hADSCs-derived exosomes could improve both functional and histological recovery after SUI.

CONCLUDING MESSAGE

We demonstrated for the first time that rats receiving exosomes derived from ADSCs as a therapeutic strategy showed improved functional and histological recovery after SUI. Proteomic analyses identified 1466 proteins, and some of these are associated with functions such as cell regeneration and migration. Thus, exosome treatment could be a new, clinically useful tool providing a cell-free therapeutic approach for treating SUI. However, future work will be necessary to confirm their implications and mechanisms.

FIGURE 1

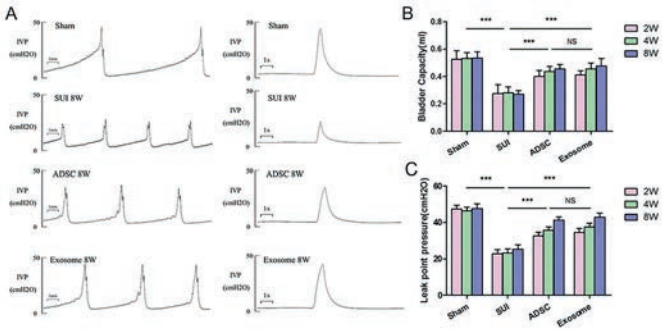
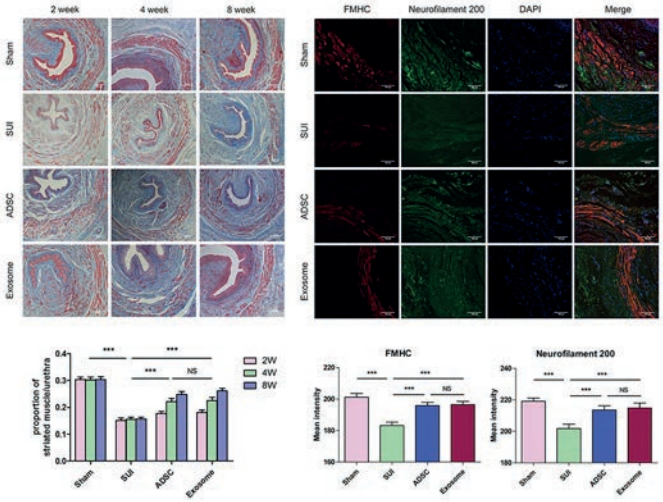


FIGURE 2



Funding National Natural Science Foundation of China (No. 81370795) **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** Medical **Ethics Committee** of Shanghai Jiao Tong University Affiliated Sixth People's Hospital

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MITOCHONDRIAL-TARGETED ANTIOXIDANT THERAPY IMPROVES SPINAL CORD INJURY ASSOCIATED UROTHELIAL DYSFUNCTION

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HYPOTHESIS / AIMS OF STUDY

Spinal cord injury (SCI) is accompanied by well-described changes in bladder function. Our previous studies revealed that SCI causes significant disruption to the rodent bladder uro-epithelium (UT) acutely (within hours) and chronically. There is substantive evidence that the urothelium plays a prominent role in the bladder 'sensory web', which impacts underlying bladder neural pathways and in turn voiding function. Thus, a better understanding of both early and late phases of SCI-induced urothelial perturbation could prevent the plastic changes in these neural/non-neuronal pathways and, in turn, the development of neurogenic bladder overactivity. Though a prominent consequence of SCI is increased oxidative stress and mitochondrial dysfunction, how these changes affect bladder function following SCI is unknown. Our recent findings show that SCI leads to significant morphological and functional defects in UT mitochondria which can be mitigated by antioxidant treatment. These findings lead us to hypothesize that SCI results in a UT mitochondrial dysregulation that can impair signalling in the UT and bladder wall. Because a local UT-afferent signalling pathway regulates sensory input to the central nervous system, it is likely that these changes in UT-neural signalling can influence voiding behaviour.

The aim of this study was to examine the impact of acute versus chronic SCI on urothelial mitochondrial dysregulation/oxidative stress and whether mitochondrial-targeted antioxidant treatment can reverse SCI-induced urothelial defects.

STUDY DESIGN, MATERIALS AND METHODS

This aim was investigated in female C57 mice (C57Bl/6; 20-25 gm; 4-5 weeks old) with complete spinal cord transection at the T9-T10 vertebrae level.

• Two time points post SCI were investigated: early (3 days) and late (28 days)

• Some animals were treated for 3 or 28 days with the mitochondria ROS scavenger MitoTempo (mTEM; 1mg/kg/day delivered via subcutaneous osmotic pump implanted at the time of SCI).

• Bladders were collected from deeply anesthetized mice and utilized for cell culture, electron microscopy and western blot per previously published methods.

• Cultured urothelial cells (UTC) were loaded with various intracellular dyes to examine functional responses. These included: Dihydrorhodamine 123 - DHR123 (fluorescent indicator of reactive oxygen species - ROS) and Tetramethylrhodamine methyl ester - TMRM (fluorescent indicator of mitochondria membrane potential, Ψm; Fig. 2).

RESULTS

We found that SCI alters UT mitochondrial morphology and function. Transmission electron micrographs revealed significant changes in mitochondrial morphology in early SCI (3 days) versus control with electron dense 'mitobodies' (dense spots in the mitochondrial matrix indicative of cellular damage) (Fig. 1). This was accompanied by loss of Ψm (~40-50%; decreased staining of TMRM indicating a loss of viability; Fig 2A), as well as increased ROS production (~20%; Fig 2B) and nitrotyrosine levels (marker of DNA oxidative damage). Elevated ROS levels are likely to play a role in the early structural changes to the mitochondria, as treatment with mTEM led to a striking decrease in mitobodies (Fig. 1), possibly resulting from an upregulation of mitophagy to remove the damaged MITO. While morphological changes in UT mitochondria had

partially recovered in late (28 day) SCI, there was still significant functional impairment in UT mitochondria (loss of Ψm) which was partially reversed with the antioxidant mTEM (Fig. 2).

INTERPRETATION OF RESULTS

While a number of factors are likely to contribute to impaired urothelial function after SCI, accumulating evidence suggests that altered cellular metabolism (i.e. mitochondrial functions) plays a key role. Mitochondrial damage is often accompanied by increased ROS production with a concomitant decrease in the ability to clear damaged mitochondria by mitophagy, which has been proposed to be central to the impairment of cellular function in various regulatory systems. The mitochondrial membrane potential Ψm is an important parameter to assess the functional state of these organelles and disturbances in Ψm can increase oxidative stress (a hallmark of SCI). ROS scavengers have been shown to protect the spinal cord and improve motor functions in animal models of CNS trauma. These findings suggest that mitochondrial-targeted antioxidant therapy restores mitochondrial balance via ROS scavenging and upregulation of mitophagy to remove damaged mitochondria. This may be a viable treatment for bladder dysfunction after SCI.

CONCLUDING MESSAGE

SCI impairs UT structure and function which can impact signalling and result in abnormal urodynamic behaviour. Our novel findings provide new exciting insights into how SCI alters fundamental UT cellular signalling processes, resulting specifically in mitochondrial dysfunction and mitophagy. Treatments that affect oxidative stress can stimulate the mitochondria thus restoring 'normal' functions. In summary, mitochondria targeted therapies may hold future promise to restore UT structure and signalling after SCI, which may contribute to improvements in bladder function in these patients.

FIGURE 1

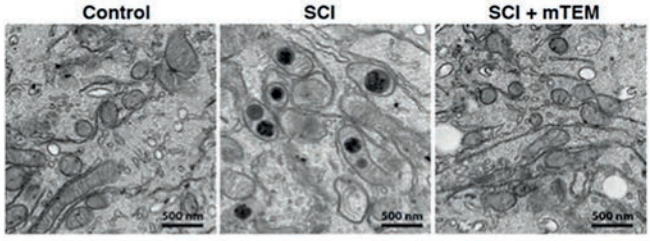

Fig. 1. Transmission electron micrographs of bladder urothelium from spinal intact (control; A), 3day SCI (B) and 3day SCI treated with mTEM (C) mice. SCI results in altered mitophagy with the presence of electron dense 'mitobodies' (red arrows). Treatment with mTEM prevents the formation of 'mitobodies' (C).

FIGURE 2

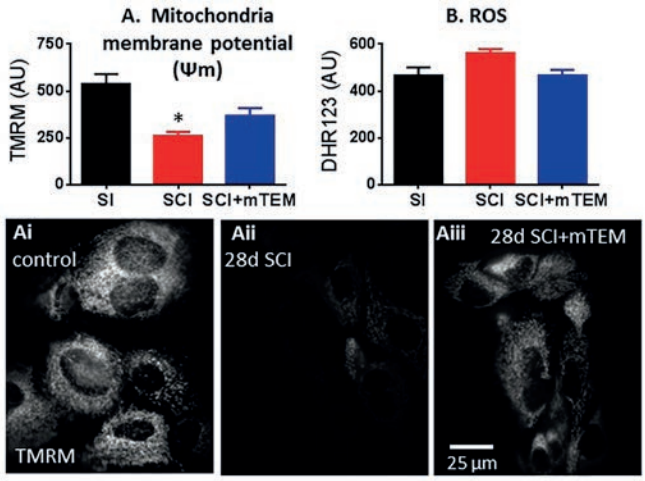

Fig. 2. Spinal cord injury alters the mitochondria membrane potential (Ψm; A) and ROS production (B) in UTC. Ai-iii Examples of cultured UTCs from spinal intact mice (control, Ai), 28day SCI mice (Aii) and 28day SCI mice treated with mTEM (Aiii), loaded with the mitochondria Ψm indicator TMRM. The intensity of the dye is proportional to the Ψm; less bright cells indicate depolarized Ψm, suggesting a loss of cell viability.

Funding P01 DK093424; R01 AG056944 **Clinical Trial** No **Subjects** Animal **Species** mouse **Ethics Committee** IACUC at University of Pittsburgh

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GEL CASTING AS AN APPROACH FOR TISSUE ENGINEERING OF MULTILAYERED TUBULAR STRUCTURES: APPLICATION FOR URETHRAL RECONSTRUCTION

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HYPOTHESIS / AIMS OF STUDY

Our group is interested in tissue engineering for urethral reconstruction performed in patients with urethral strictures or congenital disorders. The CS is an integral part of the urethra and important in supporting the function of the urethra. In case of a healthy CS, success rates of replacement with epithelial tissue like skin or oral mucosa can reach up to 90%. However, in case of severe fibrosis or absence of CS in congenital disease (hypospadias) success rates are lower. Currently there is a lack of tissue-engineered solutions for replacement/ regeneration of urological tissues, like ureters and the urethra/CS. Such tissues present a complex tubular organization with different cell layers. Given the important role of the CS in urethra function, tissue engineering of the

urethra should be combined with reconstruction of the CS [1]. We showed that the CS is a three-layered, highly vascularized structure with distinct distribution of extracellular matrix (ECM) components (Figure 1A). Therefore, we hypothesize that by an innovative casting approach to build multilayered tubular constructs based on micro-fiber reinforced hydrogels CS tissue constructs can be generated that mimic the structure/organization of the native tissue.

STUDY DESIGN, MATERIALS AND METHODS

A mold with three chambers, representing the three layers of the CS (Fig. 1B), was designed, and fabricated using polydimethylsiloxane (PDMS) molding. The chambers were loaded with gelatin-transglutaminase hydrogels (mTG gel) containing a coculture of endothelial cells and pericytes (layer 1 and 3) and smooth muscle cells (SMCs, layer 2).

A melt-electrospun poly(caprolactone) (PCL) fibre mesh was incorporated at the base of the construct to serve as a porous support for the hydrogels and to roll the construct into a multilayered tubular construct (Fig. 1C). The hydrogels were mechanically tested and compared to native tissue (equine urethra).

RESULTS

The custom-made mold was successfully designed and made from PDMS. The PDMS mold was easy in terms of fabrication and handling and ensured excellent mold removal from the hydrogel. The mTG gel, containing either a combination of HUVECs and pericytes in chamber 1 and 3 or SMCs in chamber 2, can be successfully casted and rolled (Fig. 2A-B). The encapsulated cells were cultured up to 2 weeks and showed good cell viability and functionality. Within two weeks little capillary-like structures were formed in layer 1 and 3 (Fig. 2C) and the SMCs express elastin (Fig. 2D). The compressive modulus of native tissue (equine urethra and CS) was similar to the mTG gel (Fig. 1B).

INTERPRETATION OF RESULTS

With this innovative gel casting approach it is possible to create multilayered tubular constructs: we were able to successfully roll the encapsulated gel into a tubular construct with distinct composition per layer. The rolling procedure did not influence the viability and functionality of the encapsulated cells. Cell survival up to two weeks has been achieved as well as functionality. The encapsulated cells are homogenously distributed throughout the gel and the HUVECs are able to form vascular networks, stabilized by pericytes, in the mTG hydrogels. Furthermore, SMCs show a high viability after encapsulation and largely express elastin which is required for mimicking the elastin-rich region of the corpus spongiosum. Mechanical testing has proven that the gel is similar to native tissue in terms of the compressive modulus.

CONCLUDING MESSAGE

This approach towards tissue engineering of multilayered tubular structures may be applicable to the urological field (to help engineer ureters or urinary diversions), as well as in other fields of soft tissue engineering. In future studies, more research should be done in further standardization and optimization of the (fiber-reinforced) gels and fabrication of the electrospun meshes. This is required for mimicking the mechanical properties of native tissue as well as optimizing vascular network formation. Next steps will be up-scaling of our casting approach to achieve grafts of clinical relevant sizes and, in parallel, testing in laboratory animals whether the vascular networks produced in the hydrogel will adapt to the native vasculature.

FIGURE 1

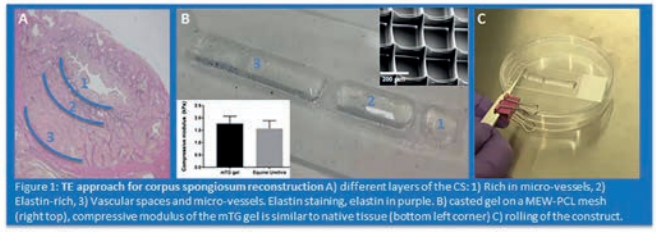

Figure 1: **TE approach for corpus spongiosum reconstruction** A) different layers of the CS: 1) Rich in micro-vessels, 2) Elastin-rich, 3) Vascular spaces and micro-vessels. Elastin staining, elastin in purple. B) casted gel on a MEW-PCL mesh (right top), compressive modulus of the mTG gel is similar to native tissue (bottom left corner) C) rolling of the construct.

FIGURE 2

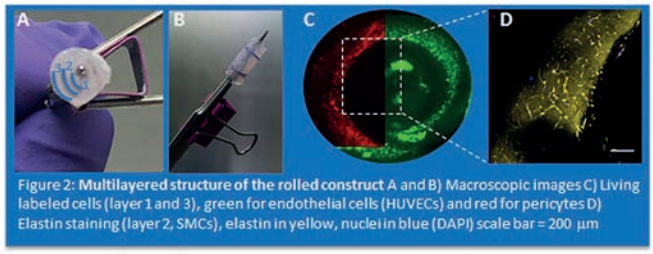

Figure 2: **Multilayered structure of the rolled construct** A and B) Macroscopic images C) Living labeled cells (layer 1 and 3), green for endothelial cells (HUVECs) and red for pericytes D) Elastin staining (layer 2, SMCs), elastin in yellow, nuclei in blue (DAPI) scale bar = 200 µm

REFERENCES

1. de Kemp, V., et al. (2015). Tissue engineering for human urethral reconstruction: systematic review ofrecent literature. PloS one 10, e0118653

Funding None **Clinical Trial** No **Subjects** None

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BEST IN CATEGORY PRIZE "PHARMACOLOGY"

MOLECULAR AND FUNCTIONAL IDENTIFICATION OF NADPH OXIDASE (NOX) IN THE UROTHELIUM: IMPLICATIONS FOR BLADDER DYSFUNCTION AND SPECIFIC ROS CONTROLLING TARGETS

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HYPOTHESIS / AIMS OF STUDY

Recognition of the urothelium as a new sensory structure is a major advance in our understanding of bladder physiology[1]. Changes to urothelial structure and function in pathological conditions further emphasize its importance

in bladder pathologies. A variety of receptors has been identified and recognised as physiological regulators of the urothelium[2]. A major step forward is the identification of novel pathological regulators in this tissue. Oxidative stress due to excessive reactive oxygen species (ROS) is a fundamental pathological mediator for aging and many chronic diseases. ROS are mainly generated by enzymatic oxidation. However, controlling ROS production by modulating these enzymes is impractical as almost all these enzymes produce ROS as a by-product while carrying essential physiological oxidation and suppressing these enzymes would compromise vital cell function. A unique class of ROS-generating enzyme is NADPH oxidase (Nox) as it is the only enzyme that produces ROS as its sole function and can be targeted without compromising physiological oxidation[3]. Identifying and targeting Nox subtypes in the body has generated intense interest in recent years however this has never been examined in bladder tissue. We hypothesize that major Nox subtypes exist in the urothelium and are a major source for superoxide; this ROS pathway plays a key role in urothelial and bladder function. This study aimed to identify the presence of major Nox subtypes in the urothelium and bladder tissue, to show that these Nox enzymes are a major source of superoxide production and define the importance of urothelial superoxide production in the body, to dissect the contribution of Nox subtypes in superoxide production, and finally to demonstrate its functional importance.

STUDY DESIGN, MATERIALS AND METHODS

C57BL/6J mice (8-14 weeks) were euthanized in compliance with the current regulations. Bladder and other tissue types were isolated, and mucosa-attached and denuded detrusor muscles and mucosal sheets were micro-dissected. Immunofluorescence and confocal microscopy determined the expression of Nox subtypes with Nox1, Nox2, Nox3 and Nox4 primary antibodies and fluorescent dye-conjugated secondary antibodies. Western blot further verified specific protein bands of Nox subtypes with their primary antibodies and the secondary antibodies conjugated with near-infrared fluorescent dyes. Lucigenin-enhanced chemiluminescence quantified NADPH-stimulated superoxide production in live tissue. Dihydroethidium (DHE) fluorescence measured intracellular superoxide generation. Human bladder mucosal samples were obtained at cystoscopy with ethical approval and informed patient consent. Tissue preparations were incubated in a HEPES-buffered physiological saline. A luciferin-luciferase assay determined tissue ATP release in the superfusate sampled adjacent to the preparations. Data are expressed as mean±SEM. Student's t-test examined two paired and non-paired normally distributed data sets; non-parametric equivalent tests were used for data sets of unknown distribution. ANOVA with post-hoc pair-wise comparison tested the difference between multiple means.

RESULTS

Immunofluorescence confocal microscopy demonstrated presence of Nox1, Nox2 and Nox4 subtypes in mouse bladder urothelial layer and smooth muscle, with higher intensity in the urothelium (n=6 bladders). Western blot further demonstrated specific protein bands for Nox1, Nox2 and Nox4 in bladder mucosa and smooth muscle (n=7). Lucigenin assay showed significant NADPH-dependent superoxide production in bladder tissues, sensitive to superoxide scavenger Tiron (10mM), with the main source from the mucosa. Superoxide production in bladder mucosa (RLU/mg tissue: 530±8, mean±SEM, n=16) was many fold higher than that in detrusor muscle (21±4, n=16, $p<0.01$), aorta (70±23, n=8, $p<0.01$), brain (12±3, n=7, $p<0.01$), kidney (95±22, n=7, $p<0.01$), ventricle (7±1, n=7, $p<0.01$) and liver (81±13, n=7, $p<0.01$). DHE imaging revealed positive staining in bladder tissue, with stronger intensity in the urothelium (n=8). Superoxide scavenger Tiron abolished the DHE fluorescence. The broad spectrum Nox inhibitor diphenyleneiodonium (DPI, 20μM) reduced superoxide production to 26±3% of control (n=7, $p<0.01$) in bladder mucosa. Mitochondria de-coupler FCCP (1μM) suppressed superoxide production to 75±11 % of control (n=7; $p<0.01$) in bladder mucosa. Xanthine oxidase inhibitor oxypurinol (100μM) produced no significant effect (85±13 % of control, n=8, $p>0.05$). Nox1 selective inhibitor NoxA1ds (5μM) inhibited superoxide production to 88±6 % of control (n=25, $p<0.01$). Nox2 specific inhibitor GSK2759039 (1μM) reduced superoxide production to 76±6 % of control (n=15, $p<0.01$). In a further set of experiments with combined inhibitors, a combination of Nox1 inhibitor NoxA1ds and Nox2 inhibitor GSK2759039 reduced the superoxide production to 71±15% of control (n=11, $p<0.05$), while addition of Nox1/Nox4 dual selective inhibitor GSK137831 (2μM) in the presence of the above two inhibitors reduced the superoxide production further to 53± 7% of control ($p<0.01$), revealing additional Nox4-selective inhibition. Application of exogenous ROS H2O2 (100μM) increased the ATP release from mucosa-attached bladder strips to 239±43% of control (n=5, $p<0.01$). Angiotensin II (1μM), an inflammatory mediator and Nox activator as shown in vascular tissue, increased the superoxide production (RLU/unit tissue: 275±76 to 317±112, n=16, $p<0.05$) and also augmented ATP release from bladder mucosa (222±20% of control, n=24, $p<0.01$). Angiotensin II also increased ATP release from human bladder mucosa samples (n=5).

INTERPRETATION OF RESULTS

Positive confocal immunofluorescence images identify the existence of Nox1, 2 and 4 subtypes in the bladder with urothelial dominance. Western blot specific protein bands provide further proof for expression of Nox1, 2 and 4 subtype molecules in bladder tissue and the urothelial importance. Significant NADPH-dependent and Tiron-sensitive lucigenin intensity suggests Nox-driven superoxide production from the bladder and presents direct evidence that Nox enzymes are functional; a stronger signal from the mucosa proves its main source from the urothelium. The strong DHE signal and consistently greater intensity in the mucosa further demonstrate the intracellular source of superoxide. The multi-fold higher levels of superoxide in the bladder mucosa, compared to detrusor muscle and several other major types of tissue known to generate significant ROS, demonstrate that the urothelium is the most predominant tissue in the body for superoxide production. The exceptionally high

capacity of the urothelium to produce superoxide explains why bladder is so sensitive to inflammation, pain and overactivity. The differential sensitivities of the bladder tissue to Nox and mitochondrial inhibitors identifies that urothelial superoxide production is mainly from Nox enzymes and, to a lesser extent, from mitochondria. The inhibitory effects of Nox1 specific inhibitor NoxA1ds and Nox2 specific inhibitor GSK2759039 on superoxide production suggest that some Nox activity are from Nox1 and Nox2 subtypes. The additional inhibition of superoxide production by Nox1/Nox4 dual inhibitor GSK137831 in the presence of Nox1 and Nox2 inhibitors to suppress Nox1 and Nox2 enzymes, uncovers additional Nox4 activity. The ability of exogenous ROS H2O2 to increase ATP release emphasizes that ROS can influence the key urothelial and bladder function. The stimulatory effect of angiotensin II, an inflammatory factor, on superoxide production and ATP release from the urothelial tissues underscores the importance of Nox-derived superoxide in bladder function and further suggests its pathological implications and human relevance.

CONCLUDING MESSAGE

These results demonstrate for the first time that the main Nox subtypes Nox1, Nox2 and Nox4 are expressed in the bladder wall, predominantly located in the urothelium; these Nox enzymes are functional in producing superoxide, with contribution from each subtype. More importantly the study has discovered that the urothelium is the most active tissue in the body for superoxide production. The main enzymatic source for superoxide production in the bladder is Nox enzymes as opposed to mitochondrial electron transport. Furthermore Nox-derived superoxide has functional importance in the bladder and also has pathological significance and human relevance. Exceptionally high levels of Nox-driven superoxide explain why bladder urothelium is susceptible to oxidative stress, inflammation and sensory dysfunction.

REFERENCES

1. Birder L and Andersson KE (2013). Urothelial Signalling. Physiol Rev 93: 653–680.
2. Sui et al. (2014). Purinergic and muscarinic modulation of ATP release from the urothelium and its paracrine actions. Am J Physiol 306: F286–F298.
3. Krause KH, Lambeth D, and Krönke M (2012). NOX enzymes as drug targets. Cell Mol Life Sci. 69:2279-2282.

Funding BBSRC BB/P004695/1; NIA 1R01AG049321-01A1 **Clinical Trial** No **Subjects** Animal **Species** Mouse; note: mouse is the main tissue source although a small number of human biopsies were also used for proof-of-principle test, with ethics approval and informed patient consent, **Ethics Committee** UK Home Office; University of Surrey **Ethics Committee**

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URETHRAL SEROTONIN STIMULATES AN URETHRO-VESICAL REFLEX

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1. Fmup & I3s-Ibmc, 2. Chsj & Fmup & I3s-Ibmc

HYPOTHESIS / AIMS OF STUDY

The sensory input generated by the urethra has an important role on bladder function (1). Although the mechanism of urethral sensory fibers excitation is unknown, it might involve specialized cells located along the urethral epithelium, including those expressing serotonin (5-HT) (1). The present work aimed to study the contribution of urethral 5-HT to the activation of local sensory fibers and initiation of an urethro-vesical reflex in the female rat. Deficient mice for typtophan hydroxylase 1 (TPH1), a rate-limiting enzyme in the conversion of tryptophan to 5-HT at the peripheral nervous system, were additionally used to investigate the effect of the absence of urethral 5-HT to bladder activity. Finally, human tissue was also used to characterize cells expressing 5-HT in the human female bladder and urethra.

STUDY DESIGN, MATERIALS AND METHODS

Urethane-anesthetized female rats and TPH1-/- mice underwent isovolumetric or urethral-open cystometries during intravesical or intraurethral infusion of saline or serotonin solution (100μM). Human and rat bladders and urethrae were immunoreacted (IR) against 5-HT, TPH1, the neuronal markers beta-3 tubulin, synaptic vesicle 2 (SV2), calcitonin gene-related peptide (CGRP) and vesicular acetylcholine transporter (VAChT). Levels of serotonin concentration and TPH1 mRNA were determined in rat tissue by HPLC and qPCR, respectively.

RESULTS

In rats, under isovolumetric conditions, intraurethral serotonin infusion, but not saline, evoked strong bladder contractions. This was abolished by urethral anesthesia with 2% lidocaine and by treatment with 5-HT2 (ritanserin, 1 mg/Kg) and 5-HT3 (Y-25130, 1 mg/Kg). serotonin receptor antagonists. Still under isovolumetric conditions serotonin infusion into the bladder had no effect on reflex contractions. Under urethral-open conditions, serotonin infusion reduced the frequency and increased the amplitude of reflex bladder voiding contractions, compared to saline infusion. TPH1-/- mice, under urethral-opened conditions, exhibited increased frequency and reduced amplitude of voiding contractions compared to WT. Serotonin concentration and TPH1 mRNA expression were high in the urethra and very low in the bladder. Cells 5-HT+ were found in the human and rat urethral epithelium, close to a sub-epithelial network of VAChT+ (cholinergic) and CGRP+ (sensory) fibers. but not in the bladder. The 5HT-IR co-localized with the IR for the neuronal markers beta-3 tubulin and SV2.

INTERPRETATION OF RESULTS
The production and release of 5-HT by urethral specialized cells, by influencing the underlying neuronal net, initiates an urethro-vesical crosstalk that reinforces bladder voiding contractions. This process is mediated by 5-HT receptors on urethral sensory afferents. The luminal stimuli leading urethral cells to release 5-HT are still unknown.

CONCLUDING MESSAGE
This study found an urethral-bladdder reflex mediated by serotonin released in the urethra, confirming previous assumptions that the urethra is a complex structure that may modulate bladder voiding activity. The stimulation of this reflex may be important in conditions where bladder emptying is not effective, such as bladder underactivity.

REFERENCES
1. Acta Physiol (Oxf). 2018 Feb;222(2). doi: 10.1111/apha.12919

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REGIONAL VARIATION IN DIAGNOSTIC TESTING FOR UNCOMPLICATED OVERACTIVE BLADDER IN THE FEMALE MEDICARE POPULATION

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HYPOTHESIS / AIMS OF STUDY
Overactive bladder (OAB) remains a common urologic ailment with direct healthcare costs now exceeding 50 billion annually. The American Urology Association (AUA) in conjunction with the Society of Urodynamics, Female Pelvic Medicine, and Urogenital Reconstruction (SUFU) released the clinical guideline on Diagnosis and Treatment of Non-Neurogenic Overactive Bladder (OAB) in Adults in 2012 in order to form a clinical framework for the diagnosis and management of this costly ailment [1]. Per the guidelines, OAB is a clinical diagnosis requiring only a careful history, physical exam, and urinalysis. Further, additional work-up including post-void residual, urodynamics, cytology, and cystoscopy are not necessary in the otherwise uncomplicated patient. The aim of our study is to determine rates of potentially unnecessary diagnostic testing in patients carrying an OAB diagnosis before and after the OAB guidelines publication.

STUDY DESIGN, MATERIALS AND METHODS
Using The Atlas Rate Generator exploring a 100% Medicare claims data sample, we identified females with a diagnosis of OAB by ICD-9 codes (596.51 for hypertonicity of bladder, 788.31 for urge incontinence/urinary urgency) within 306 hospital referral regions (HRR). The sample includes patients seen by any provider who makes the diagnosis of OAB, including urologists, urogynecologists, and family practioners. We then identified those beneficiaries with a CPT code for a procedure defined as unnecessary for uncomplicated OAB. Rates of diagnostic tests within HRR were compared to the national average adjusted by age and race, computed as a "observed-to-predicted" ratio.

Figure 1 displays the CPT codes included in the analysis. Rates of diagnostic tests within HRR were compared to the national average adjusted by age and race.

We excluded those beneficiaries who had a CPT code for a third line treatment of OAB (peripheral tibial nerve stimulation, onabotulinum toxin detrusor injection, sacral nerve stimulation).

We collected data from 2011 and 2014, before and after the publication of the AUA/SUFU OAB guidelines.

RESULTS
The national average rate for potentially unnecessary diagnostic procedures performed on patients with OAB was 41% (163,919/399,004) in 2011, and only slightly decreased to 38.2% (169,706/443,512) in 2014. Comparing HRRs to the national rate, use of diagnostic procedures demonstrated 7-fold variation even after controlling for age and race (Figure 1, 2). In 2011 the lowest rate was identified in Minot, ND (0.260) and the highest in Fort Myers, FL (2.036).

By 2014, following the widespread dissemination of the AUA/SUFU guidelines, the lowest rate was identified in Rapid City, SD (0.304) and the highest again in Fort Myers, FL (2.37). Rates of additional procedures were typically highest in the southeast for both years. Figure 2 displays ratio of observed-to-predicted events for diagnostic testing of uncomplicated OAB among female Medicare beneficiaries in 2011 and 2014.

INTERPRETATION OF RESULTS
There is significant regional variation in utilization of UDS in the diagnosis of OAB at HHR level. The overall rates of unnecessary diagnostic testing did decrease slightly from 2011 to 2014, but not to a significant level. Our results parallel those seen in other specialties where the results of guidelines and publication of randomized control trials do not lead to improvements in clinical practice [2].

The strengths of our study include the fact that 100% of Medicare female beneficiaries were included. Limitations include our inability to account for coding errors with the claims data. In addition, we were unable to stratify the results according to urologists, urogynecologists, and primary care practitioners. We also did not differentiate between different diagnostic testing, such as post-void residual, which is non-invasive and inexpensive, versus cystoscopy, which is invasive and costly.

CONCLUDING MESSAGE

While there was a decrease from 41% to 38% in diagnostic testing for OAB, the rates of diagnostic testing did not appear to change significantly after the publication of the AUA/SUFU OAB guidelines. Further research is needed to identify how much of this diagnostic testing is inappropriate in order to decrease healthcare costs. Additionally, more research is needed to explore the relationship of diagnostic testing to management outcomes.

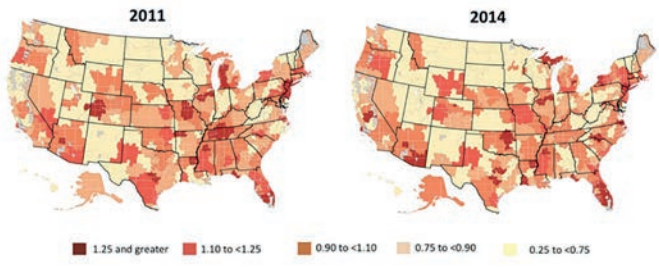
FIGURE 1

Table 1. CPT codes for procedures defined as unnecessary for the diagnosis of uncomplicated OAB.

Procedure	CPT Codes
Cystoscopy	52000
Urodynamics (51728, 51729, 51726)	51728, 51729
Complex cystometrogram	51726
Simple uroflometry	51736
Pressure-flow study	51797
Cystogram	51600
EMG	51784, 51785
PVR with ultrasound	51798
Simple cystometrogram	51725
PVR with straight catheterization	51701
Cystography	74430
Cystoscopy with urethral dilation	52281
Cystoscopy with bladder biopsy	52204
Cytology	88112

FIGURE 2

Figure 1. Diagnostic Testing of Uncomplicated OAB among Female Medicare Beneficiaries: observed/predicted events, 2011 and 2014



REFERENCES

1. E. Ann Gormley, Deborah J. Lightner, Kathryn L. Burgio, et al. Diagnosis and Treatment of Overactive Bladder (Non-Neurogenic) In Adults: AUA/SUFU Guideline. 2014 American Urological Association Education and Research, Inc. http://www.auanet.org/guidelines/overactive-bladder-(oab)-(aua/sufu-guideline-2012-amended-2014). Accessed March 2018
2. Grimshaw JM, Russell IT. Effect of clinical guidelines in medical practice: a systematic review of rigorous evaluations. Lancet. 1993;342:1317-1322

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HIGHER BODY FAT PERCENTAGE AS A IS RISK FACTOR OF OVERACTIVE BLADDER AT OVERWEIGHT WOMEN

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HYPOTHESIS / AIMS OF STUDY

Many authors have compared the relationship between overactive bladder (OAB) and obesity. However, there is a lack of studies investigating the impact of being overweight and body fat distribution as risk factors for OAB on various aspects of quality of life (QoL). Being overweight is the precursor to obesity. It is referred to as its first stage and brings an increased risk of health complications. The aim of this study was to compare body composition in overweight women with OAB compared to women without OAB, and to determine the severity of the symptoms of OAB, as well as to investigate the impact of OAB on QoL.

STUDY DESIGN, MATERIALS AND METHODS

We determined the sample number according to prevalence of OAB according to the following estimation: n = Z2P(1 - P)/d2, where Z = 1.96 (95% confidence level), P = 0.16 for expected OAB prevalence of 16% and d = 0.05 (10% confidence interval [CI] width). Based on this calculation, the minimum number was set at n = 195 participants. The research population comprised a convenient sample of university students. The women were randomly selected from two universities. In all, 7943 women completed a screening questionnaire with age, height, and weight information. Calculation of body mass index (BMI = m/h2, where m = body weight in kg and h = body height in m). All overweight women (BMI 25-29) were enrolled, with a total number of 1932. Of this number, every 7th woman was randomly selected, so a total of 276 women were examined.

The inclusion criteria were as follows: women aged 18-35 years; BMI 25-29.

The exclusion criteria were: stress urinary incontinence (SUI), surgery for gynaecological or urological diseases, infection of the urinary tract, oncological or neurogenic disease of the lower urinary tract, incomplete questionnaires, and refusal to participate in the study.

We used the Voiding Diary, the Overactive Bladder Questionnaire (OAB-q), and the Incontinence Quality of Life (I-QOL) scale. Body composition was measured using direct segmental multi-frequency bioelectrical impedance analysis with body composition analyser, with assessment of: skeletal muscle mass (kg), body fat mass (kg), body fat percentage (%), visceral fat area (cm2/level), and waist to hip ratio. Par-

ticipants had OAB if they had urinary urgency, voiding eight or more times per day, two or more times per night, with or without urgency urinary incontinence.

RESULTS

The sample consisted of 206 out of 276 women with an average age of 30.6±20.4 years, the response rate was 74.6%. Out of these, 102 were women with OAB and 104 without OAB. The voiding diary and OAB-q results confirmed OAB in 102 women. There was no significant difference in BMI between groups. The body composition analysis showed significant differences in body fat percentage, visceral fat area, and waist to hip ratio with significantly higher values in the OAB group ($p < 0.01$), skeletal muscle mass (kg), however, was significantly higher in the group without OAB ($p < 0.01$). Recorded I-QOL scores showed significantly worse parameters in total score in the OAB group ($p < 0.001$). Women with fat percentage above 28% have a 1.95 times greater chance of developing OAB. Odds ratio [OR] = 1.95, (95% CI: 1.09-3.52, $p = 0.024$). The results are summarized in Table 1.

Table 1. Statistical comparison of monitored parameters in women with and without OAB

INTERPRETATION OF RESULTS

We evaluated OAB by means of voiding diary and OAB-q questionnaire. Significantly higher values were found in the OAB group for body fat percentage, visceral fat area, and waist to hip ratio with comparable BMI, confirming overweight by means of Body Composition Analysis. However, skeletal muscle mass was significantly higher in the non-OAB group.OAB has a negative impact on QoL. Data from two studies indicate, that measures of central adiposity are also correlated with urgency urinary incontinence 1, 2.

CONCLUDING MESSAGE

Higher body fat percentage, visceral fat area, and waist to hip ratio were significantly higher in overweight women with OAB, though comparable BMI. Women with fat percentage more than 28 % have 1.95 greater likelihood of developing OAB.

FIGURE 1

Table 1. Statistical comparison of monitored parameters in women with and without OAB

Parameter	Women with OAB mean±SD n=102	Women without OAB mean±SD n=104	P t-test
Age (years)	30.6±20.1	30.3±20.7	0.517
Body mass index (kg/m²)	25.8±3.0	25.3±2.8	0.613
Voided volume during 24 hours (mL)	1288.3±534.5	1330.2±463.6	0.508
Number of voidings per 24 hours	9.1±2.1	5.6±0.9	<0.001
Voided volume during day (mL)	1063.5±521.0	1299.2±470.3	0.965
Daytime frequency	7.0±1.9	5.4±0.9	<0.001
Voided volume during night (mL)	224.8±111.0	28.1±65.7	<0.001
Nighttime frequency (nocturia)	2.1±0.4	0.4±0.3	<0.001
Mean voided volume during per 24 hours (mL)	142.3±54.1	212.7±69.7	<0.001
Mean voided volume during day (mL)	153.7±66.1	236.9±71.0	<0.001
Mean voided volume during night (mL)	105.8±47.9	161.0±52.7	<0.001
Symptom score on OAB-q	15.7±9.8	4.0±4.3	<0.001
Quality of life on OAB-q	92.0±6.1	97.8±2.8	<0.001
Skeletal muscle mass (kg)	24.6±2.9	25.4±4.0	0.002
Body fat mass (kg)	21.8±8.4	21.9±7.6	0.329
Body fat percentage (%)	32.6±8.0	29.4± 5.9	0.019
Visceral fat area (cm²/level)	92.3±35.9	84.9±25.3	0.012
WHR waist to hip ratio	2.6±11.8	0.9±0.1	0.004
Quality of life I-QOL (TS – total score)	95.2±5.8	99.1±1.3	<0.001

REFERENCES

1. The Journal of urology, 2011, 185(3), 955-963.
2. Journal of Korean Medical Science, 2011, 26(2), 250-257.

Funding Ethical approval: All participants enrolled signed an informed consent. The study was approved by the **Ethics Committee** at University Hospital, Martin, Slovakia. Our study had been conducted in accordance with recognised ethical standards and national/international laws. **Funding** – NONE. **Clinical Trial** No **Subjects** Human **Ethics Committee Ethics Committee** at University Hospital, Martin, Slovakia **Helsinki** Yes **Informed Consent** Yes

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TEMPORAL SUMMATION IS ELEVATED IN WOMEN WITH OAB REPORTING HIGH PSYCHOSOCIAL BURDEN

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HYPOTHESIS / AIMS OF STUDY

As an induced state of spinal hypersensitivity and a well-recognized mechanism of centrally amplified pain perception that facilitates afferent signaling, it is plausible that central sensitization (CS) may contribute to manifestations of Overactive Bladder (OAB) symptoms in some women. Individuals with CS characteristically report greater psychosocial and somatic symptom burden. The aim of the study was to determine if subgroups of women with OAB identified by cluster analyses based on psychosocial characteristics would demonstrate varying degrees of heat pain temporal summation.

STUDY DESIGN, MATERIALS AND METHODS

After Internal Review Board approval, we enrolled 97 women with idiopathic OAB from the Urology clinic and through advertisement, using a score of >= 4 on the OABq-V3 to confirm the diagnosis. Participants completed question-

naires detailing demographic and clinical history as well as OAB symptoms (OAB questionnaire) and urinary tract symptoms (ICIQ-Female LUTS questionnaire). To assess psychosocial symptom burden, the subjects completed the PROMIS depression, anxiety, and pain short form items and the perceived stress scale. As a measure of somatic symptom burden, they completed the Central Sensitivity Index (CSI) Subjects then underwent quantitative sensory testing to measure thermal cutaneous temporal summation (TS) on the ventral forearm, with a series of 10 oscillating heat pulses to 49°C of 0.4 hertz. Immediately after the peak of every heat pulse, subjects provided a verbal numeric pain intensity rating using a 0 – 100 visual analog scale (VAS). We calculated a standardized slope fitted to the first 5 pain ratings for each subject to serve as the primary index of TS. We performed a two-step cluster analysis incorporating the PROMIS depression, anxiety, and pain scores, perceived stress scale, and the CSI, with the derived clusters representing the primary exposure measures for the data analyses. Statistical analyses using T-test and linear regression compared clinical variables across the primary exposures of cluster groups. For regression analysis of TS, we also included the initial VAS pain score at the first heat trial as an effect modifier to control for confounding due to baseline effects on observed slopes (i.e., floor or ceiling effects).

RESULTS

Cluster analyses identified two cluster groupings with 29 subjects in Cluster 1 and 68 in Cluster 2 , demonstrating moderate separation (silhouette index = 0.5). Characteristics of the cluster variables are demonstrated in Table 1, with the relative importance of each individual factor on the clustering represented by descending order. Cluster 1 represented an overall increased burden of psychosocial symptoms compared to Cluster 2. Age and BMI did not differ between the two groups (Table 2). However, OAB symptom burden and health-related quality of life score were significantly higher for Cluster 1 compared to Cluster 2. In addition, total urinary symptom severity, as well as sub-scores for filling, and voiding symptoms, were higher in Cluster 1. There was no difference in incontinence severity. During the TS protocol, the means of the initial VAS rating were similar between the two groups (38.8 vs. 35.5, p=.5). The mean slope of the TS was significantly higher for Cluster 1 compared to Cluster 2, including adjustment for initial VAS pain score (Beta = 1.8, SE = .83 t = 2.15, p =.03).

INTERPRETATION OF RESULTS

In this sample of women with OAB, a subgroup defined by increased burden of psychosocial and somatic characteristics not only demonstrated increased OAB-specific and lower urinary tract symptom severity, but also demonstrated higher levels of TS during quantitative sensory testing. This difference in TS indexes suggests that some women with OAB appear to have CS, which is also reflected by increased psychosocial symptom burden. The implications for management of these women with CS remains to be determined; however, this study which maps clinical phenotypes to postulated disease mechanisms represents a first step towards mechanistic-directed OAB management.

CONCLUDING MESSAGE

The findings in this study support the hypothesis that CS contributes to mechanisms underlying OAB in some women.

FIGURE 1

Table 1. Demographic and medication information, reported as Mean (SD) or # (%).

	No BD	FC	IBS	P
Age	51.7 (15.4)	49.2 (17.1)	51.5 (11.9)	0.7
BMI	29.6 (7.4)	30.4 (7.4)	34.1 (8.8)	0.1
Medications				
Anticholinergics	12 (21)	7 (25)	2 (15)	0.8
Narcotics	3 (3)	4 (14)	2 (15)	0.2
Anxiety meds	10 (17)	5 (18)	5 (38)	0.2
Other pain meds	8 (14)	6 (21)	1 (8)	0.5

FIGURE 2

Table 2. Urinary symptoms and constipation severity scores. Data reported as mean (SD).

	No BD	FC	IBS
OABq Symptom Score	47.2 (22.3)	57.7 (24.0)^	70.6 (20.3)^
OABq QOL	66.8 (24.9)	53.9 (27.5)^	34.6 (25.2)^*
ICIQ FLUTS	15.2 (6.1)	17.2 (6.9)	25.4 (8.7)^*
ICIQ UI sub	7.8 (7.8)	8.3 (5.2)	12.5 (5.1)^*
ICIQ Void	1.6 (1.7)	2.4 (2.2)	4.2 (2.5)^*
ICIQ Fill	5.8 (2.6)	6.7 (2.8)	8.7 (3.0)^*
CSS	1.7 (1.3)	7 (3.6)^	8.6 (6.3)^

^ denotes significant difference from no BD group
*denotes significant difference between IBS and FC groups

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METABOLISM OF FATTY ACIDS AND BILE ACIDS IN PLASMA ARE ASSOCIATED WITH OVERACTIVE BLADDER: METABOLOMICS ANALYSIS FOR POSSIBLE BIOMARKERS AND POTENTIAL TARGETS FOR NEW TREATMENTS

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HYPOTHESIS / AIMS OF STUDY

Overactive bladder (OAB) is common in aged male and have a major influence on quality of life (QoL). OAB patients are treated with anti-cholinergics and ß3-agonists. However,

OAB symptoms persist even after treatment in some patients, which supports the fact that the mechanisms responsible for OAB remain unclear. The previous reports revealed that amino acid profile was associated with lower urinary tract symptoms (LUTS) from metabolomics analysis, which enables the detection and semi-quantitative measurement of hundreds of unique metabolites from broad range of metabolic pathways (1). In the present study, we identified metabolites from metabolomics approach and investigated association between these metabolites and urgency as a major complaint of OAB.

STUDY DESIGN, MATERIALS AND METHODS

A total of 47 male participants without apparent neurological diseases at our outpatient clinic were enrolled in the present study; Age: 71.5+/-4.4 years old, body mass index (BMI): 23.0 +/-2.8. A 24hrs-bladder diary was carried out to assess behavior of micturition, and we used the International Prostate Symptom Score (IPSS) and QoL score to analyze LUTS and QoL. OAB was defined as a urgency score of IPSS was 2 and more (OAB-group), and patients with 0 and 1 was belong to Control-group. To investigate association with OAB in males and novel molecular insights into disease pathogenesis, we conducted a comprehensive study of plasma metabolites using liquid chromatography time-of-flight mass spectrometry (LC-TOFMS). Metabolites were compared between OAB - and Control-groups using Student t-test as a screening, and association with male OAB from metabolites in LC-TOFMS were analysed using a multivariable logistic regression analysis to reveal the odds ratio and 95% confidence interval (CI).

RESULTS

Of 47 participants, 26 males were in OAB-group and the other 21 males in Control-group. A 24hrs-bladder diary revealed that nocturnal urine volume, 24hrs-micturition frequency, nocturnal micturition frequency and nocturnal index were significantly higher in OAB-group. Although maximum voided volume was significantly lower in OAB-group, 24hrs-urine volume or nocturnal polyuria index was not different between groups. (Table 1) Metabolomics analysis with LC-TOFMS identified 79 metabolites from plasma of participants. In a total of 6 metabolites, there was significant difference or a trend of difference between OAB- and Control-groups. Regarding these 6 metabolites, a multivariate analysis showed that increases of FA (22:1) Erucic acid, Palmitoleic acid and cis-11 Eicosenoic acid and a decrease of cholic acid were significantly associated with incidence of OAB in males. A decrease of Glycodeoxy cholic acid could be also associated with male OAB. (Table 2)

INTERPRETATION OF RESULTS

It hase been reported that metabolic pathways of fatty acids and bile acids are involved in metabolic syndrome (2)(3). The present study revealed that male OAB could be also associated with abnormalities in metabolic pathways of fatty acids and bile acids. Controlling metabolism of fatty acids and bile acids in plasma could be one of attractive therapeutic targets of over active bladder.

CONCLUDING MESSAGE

OAB in males could occur through abnormal metabolism of fatty acids and bile acids, which could be associated with metabolic syndrome. Further studies using results of metabolomics analysis have a potential to detect new biomarkers and develop potential targets for new treatments.

FIGURE 1

Table 1: Data in frequent volume chart

	Control	OAB	P-value
24hrs-urine volume(mL)	1525 +/- 512	1915 +/- 1143	0.1543
Nocturnal urine volume(mL)	482 +/- 151	666 +/- 305	0.0179
24hrs-micturition frequency(times)	6.7 +/- 1.3	11.2 +/- 4.3	<0.001
Nocturnal micturition frequency (times)	0.7 +/- 0.6	2.2 +/- 1.0	<0.001
Maximum voided volume(mL)	370 +/- 110	301 +/- 115	0.0407
Nocturnal polyuria index(%)	31.3 +/- 11.0	37.2 +/- 13.5	0.1109
Nocturia index(times)	1.3 +/- 0.5	2.3 +/- 0.7	<0.001

FIGURE 2

Table 2: The odds ratio associated with a one-unit increase of substances

Substances	Odds ratio	95%CI	P-value
Cholic acid	0.9893	0.9745, 0.9988	0.0251
FA (22:1) Erucic acid	1.4867	1.0774, 4.5834	0.0003
Glycodeoxy cholic acid	0.8839	0.5852, 1.0021	0.0677
Nervonic acid	1.0859	0.9597, 1.2657	0.2034
Palmitoleic acid	4.1190	1.1271, 22.4764	0.0298
cis-11 Eicosenoic acid	4363.316	6.621, 16058471	0.0101

Covariates: age, BMI, 24hrs-urine volume, nocturnal urine volume, medications for LUTS and comorbid conditions of metabolic syndrome including hypertension, diabetes or hyperlipidemia

REFERENCES

1. Mitsui T, et al., Metabolomics Approach to Male Lower Urinary Tract Symptoms: An Identification of Possible Biomarkers and Potential Targets for New Treatments. J Urol, in press, 2018
2. Cooke AA, et al., Fatty acids and chronic low grade inflammation associated with obesity and the metabolic syndrome. Eur J Pharmacol, 785:207-214, 2016
3. Taoka H, et al., Role of bile acids in the regulation of the metabolic pathways. World J Diabetes, 7:260-70, 2016

Funding JSPS KAKENHI Grant Number 26861263 **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** The Institutional Ethical Board for Epidemiological Studies at the University of Yamanashi **Helsinki** Yes **Informed Consent** Yes

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A PHASE 4, DOUBLE-BLIND, RANDOMIZED, PLACEBO-CONTROLLED, PARALLEL GROUP, MULTI-CENTRE STUDY TO EVALUATE THE EFFICACY, SAFETY, AND TOLERABILITY OF MIRABEGRON IN OLDER ADULT PATIENTS WITH OVERACTIVE BLADDER SYNDROME (PILLAR)

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HYPOTHESIS / AIMS OF STUDY

Overactive bladder (OAB) is increasingly common amongst older people. OAB is associated with an adverse impact on quality of life and well-being in addition to well-described adverse health-related outcomes. Should lifestyle and behavioural measures fail then, until relatively recently, pharmacological options consisted of antimuscarinic therapy, the effectiveness of which may be hampered by unacceptable adverse effects which in themselves limit treatment adherence. The development of the beta-3-agonist, mirabegron, offers an alternative option for treatment of older people; however, older people make up the minority of those enrolled in prospective trials to date. The aim of this study was to assess the effect of mirabegron vs placebo in a pragmatic, prospective, randomised, placebo-controlled trial in patients aged ≥65 years, with the aim of including ≥30% patients >75 years old.

STUDY DESIGN, MATERIALS AND METHODS

A 12-week, prospective, randomized, placebo-controlled trial was conducted in patients >65 years of age with OAB symptoms for ≥3 months in the United States and Canada. Patients with ≥1 incontinence episode, ≥3 urgency episodes (grade 3 or 4), and an average of 8 micturition episodes/day based on the 3-day micturition diary were included. Exclusion criteria included nursing home residence, limited life expectancy (<6 months), bladder outlet obstruction, predominant stress incontinence, elevated (>150 mL) post-void residual volume, neurogenic detrusor overactivity, acute urinary tract infection, recent (<30 days) initiation of conservative or invasive therapy for OAB, permanent or intermittent catheterization, severe renal or hepatic impairment, uncontrolled hypertension or malignancy within the last 5 years. Mental incapacity to complete the study requirements or consent procedures was the only cognitive exclusion criterion. Patients were randomized to receive mirabegron 25 mg/day with the option of dose escalation at 4 or 8 weeks depending upon individual tolerability (with no de-escalation) or placebo.

The primary analysis set was comprised of randomized patients who received ≥1 dose of study drug, had a micturition measurement at baseline, had ≥1 incontinence episode at baseline, and had ≥1 post-baseline micturition measurement. The co-primary end points were change from baseline to end-of-treatment (EOT) in mean number of micturitions/24 hour and mean number of incontinence episodes/24 hour based on a 3-day micturition diary for all mirabegron vs placebo treated patients. Secondary end points included change from baseline to EOT in mean volume voided per micturition, symptom bother and total health related quality of life scores as assessed by OAB-q questionnaire, and Patient Perception of Bladder Condition (PPBC). Cognitive function was assessed by change from baseline to EOT in the Montreal Cognitive Assessment (MoCA) score. Safety analyses were performed on the safety analysis set, defined as all patients who received ≥1 dose of study drug.

Based upon previous data from the mirabegron clinical trial program on the mean reduction in micturitions and likely response in incontinence episodes/24h in United States patients aged ≥65 years with total mirabegron vs placebo at 80% power, 400 patients per treatment arm were required. A 30% screen failure rate was anticipated and in order to randomize 800 patients, 1,150 patients were expected to be screened.

RESULTS

In total, 888 patients were randomized (placebo, n=443; mirabegron, n=445). Of those who received mirabegron, 226 received 25 mg and 219 elected to titrate to mirabegron 50 mg by the end of the study. Demographic details and baseline characteristics are shown in Table 1. Ethnicity, race, and age categories were similar across the treatment arms. Primary outcome variables are shown in Table 2. Responder rates for zero incontinence episodes at EOT were 122/424 (28.8%) for placebo, 84/214 (39.3%) for mirabegron 25 mg, and 77/215 (35.8%) for mirabegron 50 mg. Overall, 10 placebo and 8 mirabegron patients discontinued the study due to an adverse event (AE). At least one treatment-emergent AE was reported by 39.4% of placebo patients, 44.2% of mirabegron 25 mg patients, and 49.8% of mirabegron 50 mg patients. The most common reported AEs (affecting ≥2% of patients) are shown in Table 2. Urinary retention was reported in 2/442 (0.5%) placebo patients and 2/219 (0.9%) mirabegron 50 mg patients. There was no statistically significant change in MoCA over the timescale of the study; patients on placebo experienced a mean (standard deviation) change of 0.2 (2.3) points vs -0.1 (2.3), and 0.3 (2.5) points for patients on mirabegron 25 mg and 50 mg, respectively.

INTERPRETATION OF RESULTS

In older patients with OAB and urgency incontinence, treatment with mirabegron in a flexible dosing regime was statistically superior to placebo in alleviating major OAB symptoms and associated bother. Apart from improvement in micturition frequency/24h, escalation to mirabegron 50 mg was not clearly associated with an additional benefit. The reason for this is unknown and requires further analysis. The baseline disease severity and medical complexity of patients choosing to escalate vs those who did not will be analyzed

separately. Mirabegron was well tolerated overall with no unexpected AEs over those previously reported in Phase 3 trials, including no adverse cognitive effects, and low incidence of withdrawal.

CONCLUDING MESSAGE

Mirabegron treatment is effective and well tolerated for the treatment of older adults with overactive bladder. Mirabegron was not associated with any adverse cognitive effects.

FIGURE 1

Table1. Baseline demographics and disease characteristics

Variable	Placebo N=442	Mirabegron 25 mg N=226	Mirabegron 50 mg N=219	Mirabegron total N=445
Female sex, n (%)	324 (73.3)	168 (74.3)	149 (68.0)	317 (71.2)
Age, mean (SD)	71.9 (6.0)	71.6 (5.8)	71.7 (5.2)	71.7 (5.5)
Age group >75 years (%)	28.1	29.2	26.9	28.1
BMI (kg/m^2), mean (SD)	30.2 (6.4)	29.2 (6.0)	30.1 (6.6)	29.7 (6.3)
Baseline OAB characteristics	**N=431**	**N=220**	**N=217**	**N=437**
OAB duration (months), mean (SD)	119.9 (112.4)	118.8 (119.2)	123.4 (112.5)	121.1 (115.8)
No prior OAB drug treatment, n (%)	415 (96.3)	215 (97.7)	211 (97.2)	426 (97.5)
Micturitions/24 h, n (%)				
<8	28 (6.5)	2 (0.9)	16 (7.4)	18 (4.1)
=8 - <10	166 (38.5)	69 (31.4)	81 (37.3)	150 (34.3)
=10 - =15	212 (49.2)	139 (63.2)	112 (51.6)	251 (57.4)
>15	23 (5.3)	10 (4.5)	8 (3.7)	18 (4.1)
missing	2 (0.5)	0	0	0
Incontinence episodes/24 h, n (%)				
>0 - =2	160 (37.1)	101 (45.9)	67 (30.9)	168 (38.4)
>2 - <4	108 (25.1)	47 (21.4)	66 (30.4)	113 (25.9)
=4	158 (36.7)	72 (32.7)	83 (38.2)	155 (35.5)
missing	5 (1.2)	0	1 (0.5)	1 (0.2)

BMI, body mass index; OAB, overactive bladder syndrome; SD, standard deviation.

FIGURE 2

Table 2. Efficacy and safety characteristics

Variable	Placebo N=431	Mirabegron 25 mg N=220	Mirabegron 50 mg N=217	Mirabegron total N=437
Adjusted change in mean number of incontinence episodes/24 hour from baseline to EOT				
Mean (SE)	-1.57 (0.13)	-2.11 (0.16)	-2.02 (0.15)	-2.06 (0.12)
95% CI for Difference	(1.82, -1.32)	(-2.43, -1.78)	(-2.31, -1.74)	(-2.30, -1.82)
P value		<0.001	0.005	<0.001
Adjusted change in mean number of micturitions/24 hour from baseline to EOT				
Mean (SE)	-2.0 (0.2)	-3.2 (0.2)	-2.0 (0.2)	-2.5 (0.2)
95% CI for Difference	(-2.3, -1.7)	(-3.6, -2.8)	(-2.4, -1.6)	(-2.8,-2.2)
P value		<0.001	0.999	<0.001
Change in mean volume voided per micturition (mL) from baseline to EOT				
Mean (SE)	18.49 (4.18)	36.08 (5.44)	29.70 (4.86)	32.44 (3.97)
95% CI for Difference	(10.28, 26.69)	(25.39, 46.76)	(20.16, 39.24)	(24.64, 40.24)
P value		<0.001	0.081	<0.001
Change in OAB-q symptom bother from baseline to EOT				
Mean (SE)	-18.69 (1.33)	-26.64 (1.71)	-20.95 (1.54)	-23.39 (1.29)
95% CI for Difference	(-21.29, -16.08)	(-29.99, -23.29)	(-23.97, -17.92)	(-25.94, -20.85)
P value		< 0.001	0.182	<0.001
Adjusted change from baseline and 95% CIs are differences in LS means between mirabegron and placebo generated from ANCOVA model with treatment groups, sex age, group (<75 years, =75 years) and country as fixed factors and baseline value as covariate.				
Adverse Event (MedDRA V 5.0)	**N=442**	**N=226**	**N=219**	**N=445**
Urinary tract infection	17 (3.8%)	5 (2.2%)	5 (2.3%)	10 (2.2%)
Fatigue	14 (3.2%)	6 (2.7%)	4 (1.8%)	10 (2.2%)
Escherichia urinary tract infection	12 (2.7%)	9 (4.0%)	2 (0.9%)	11 (2.5%)
Headache	12 (2.7%)	15 (6.6%)	8 (3.7%)	23 (5.2%)
Upper respiratory tract infection	10 (2.3%)	3 (1.3%)	7 (3.2%)	10 (2.2%)
Nasopharyngitis	10 (2.3%)	3 (1.3%)	2 (0.9%)	5 (1.1%)
Dizziness	7 (1.6%)	1 (0.4%)	5 (2.3%)	6 (1.3%)
Diarrhoea	6 (1.4%)	11 (4.9%)	2 (0.9%)	13 (2.9%)
Nausea	6 (1.4%)	7 (3.1%)	1 (0.5%)	8 (1.8%)

Sorted by incidence in placebo group.
ANCOVA, analysis of covariance; CI, confidence interval; EOT, end-of-treatment; LS, least squares; SE, standard error.

Funding Astellas Pharma **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov Identifier: NCT02216214 **RCT** Yes **Subjects** Human **Ethics Committee** University of Alberta Health Research Ethics Board **Helsinki** Yes **Informed Consent** Yes

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RELATIONSHIP BETWEEN EXCESS VISCERAL FAT ACCUMULATION AND THE DEVELOPMENT AND SEVERITY OF OVERACTIVE BLADDER

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HYPOTHESIS / AIMS OF STUDY

Excessive abdominal visceral fat induces abnormal secretion of adipocytokines. This leads to an excessive production of various inflammatory cytokines, inducing systemic inflammation, and, ultimately, metabolic syndrome. The spread of systemic inflammation due to metabolic syndrome is the cause of various lifestyle diseases. Furthermore, metabolic syndrome has been recently reported to be an important factor affecting lower urinary tract symptoms, including overactive bladder (OAB). Several cross-sectional studies have shown associations between lower urinary tract symptoms and obesity and body mass index (BMI). However, no study has elucidated the relationships between an excessive accumulation of visceral fat, which triggers metabolic syndrome, and OAB morbidity and severity. Therefore, the present study aimed to clarify the relationship between the visceral fat level and OAB.

STUDY DESIGN, MATERIALS AND METHODS

We targeted patients who underwent abdominal computed tomography (CT) during a health checkup and had not received treatments for lower urinary tract symptoms prior to the present study. Exclusion criteria were acute urinary tract infection and any condition affecting urinary function, including a history of pelvic surgery, benign prostatic hyperplasia, urethral stricture, urological malignancy, and neurogenic bladder. In addition, patients with incurable cancer were excluded.

Using the OAB symptom score (OABSS), we defined OAB as a score ≥ 2 on question 3 (urgency) and a total score ≥ 3. We examined the relationships of OAB and the total OABSS to the visceral fat area (VFA), visceral fat volume (VFV), subcutaneous fat area (SFA), subcutaneous fat volume (SFV), and total abdominal fat volume (TAV), as calculated on CT. Visceral fat measurements were performed using the three-dimensional image analysis system, SYNAPSE VINCENT (Fujifilm, Tokyo, Japan).

RESULTS

A total of 190 participants were enrolled (mean age, 60.4 ± 14.8 years). Ninety patients (47.4%) met OAB criteria. The mean age in the OAB group was higher than that in the non-OAB group (non-OAB group, 54.2 ± 15.2 years; OAB group, 67.4 ± 10.9 years; $P < 0.001$). In addition, the mean body weight in the OAB group was significantly higher than that in the non-OAB group (non-OAB group, 54.5 ± 10.2 Kg; OAB group, 57.6 ± 13.0 Kg; $P = 0.035$). However, the mean BMI was not significantly different between two groups (non-OAB

group, 22.2 ± 3.5 Kg/m2; OAB group, 22.9 ± 4.7 kg/m2; P = 0.265). On abdominal CT, the non-OAB and OAB groups were significantly different in the VFA (73.8 ± 5.8 cm2 vs 112.1 ± 71.3 cm2, respectively; P < 0.001), VFA/SFA ratio (0.53 ± 0.29 vs 1.07 ± 0.97, respectively; P < 0.001), VFV (1860.8 ± 1234.5 cm3 vs 3167.3 ± 2269.9 cm3, respectively; P < 0.001), VFV/SFV ratio (0.52 ± 0.28 vs 1.55 ± 3.81, respectively; P = 0.008), and VFV/TAV ratio (32.5 ± 10.6 vs 49.7 ± 14.3, respectively; P < 0.001). In addition, among the evaluated imaging factors, the VFV/TAV ratio had the strongest correlation to the total OABSS (r = 0.464, P < 0.001). In the receiver-operating characteristic curve for the VFV/TAV ratio and OAB, the area under the curve was 0.836. A sensitivity and specificity of 0.591 and 0.810, respectively, were obtained using a cutoff value of 0.591. Furthermore, a high VFV/TAV ratio (> 0.591) was an independent risk factor of OAB in the multivariate analysis (odds ratio, 4.66; 95% confidence interval, 1.03–33.2, P = 0.045), which included age, sex, VFV/TAV ratio, and high blood pressure, as these factors were significantly associated with OAB in the univariate analyses.

INTERPRETATION OF RESULTS

We evaluated the relationship between body fat volume and the presence of OAB. In the present study, there was no association between BMI and OAB, and the VFV was related to the presence of OAB rather than the VFA. Among the evaluated parameters, the VFV/TAV ratio had the greatest relationship to OAB symptoms. In addition, the VFV/TAV ratio correlated with the severity of OAB and was an independent risk factor of OAB. Together, these results suggest that an excessive accumulation of visceral fat, which triggers metabolic syndrome, increases the risk of OAB.

CONCLUDING MESSAGE

Although the present study is cross-sectional in nature, the results suggest that an excess accumulation of abdominal visceral fat is an important risk factor of OAB.

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CAN ONABOTULINUMTOXINA IMPROVE SYMPTOMS AND QUALITY OF LIFE IN ALL PATIENTS WITH OVERACTIVE BLADDER, REGARDLESS OF DISEASE DURATION OR BODY MASS INDEX?

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HYPOTHESIS / AIMS OF STUDY

Randomized, placebo-controlled, multicenter trials with onabotulinumtoxinA 100U have demonstrated significant improvements in urinary incontinence (UI) and quality of life (QOL) in patients with idiopathic overactive bladder (OAB) inadequately managed by an anticholinergic.1-3 Yet, little information is available on the impact of either prior OAB duration or body mass index (BMI) on treatment effect and safety. This pooled post hoc analysis of several similarly designed placebo-controlled trials was undertaken to evaluate the efficacy and safety of onabotulinumtoxinA 100U according to baseline OAB duration and BMI in OAB patients with UI.

STUDY DESIGN, MATERIALS AND METHODS

OAB patients were enrolled into 3 randomized, placebo-controlled, phase 3 trials and a randomized phase 4 post-marketing study, and all patients experienced ≥3 urgency UI episodes over a 3-day period and ≥8 micturitions per day. All patients were inadequately managed by an anticholinergic, and they received ≥1 onabotulinumtoxinA 100U treatment. Patients with a predominance of stress UI were excluded. In this pooled post hoc analysis, patients were stratified by baseline OAB duration (<2 [n=279], 2–5 [n=641], and >5 years [n=505]) and BMI (<25 [n=317], 25–<30 [n=454], 30–<40 [n=502], and ≥40 [n=153] kg/m2). Assessments at week 12 following a first treatment with onabotulinumtoxinA included mean change in UI episodes/day, proportions of patients with a 100% reduction in UI episodes/day (complete continence) and ≥50% reduction in UI episodes/day, mean change from baseline to week 12 in King's Health Questionnaire (KHQ) role and social limitations domain scores, and proportions of patients who achieved/exceeded the minimally important difference (MID, 5 points) on the KHQ domains. Scores on the KHQ range from 0 to 100, with lower scores indicating better QOL. Adverse events (AEs) and the incidence/duration of clean intermittent catheterization (CIC) were recorded. Efficacy and QOL outcomes were analyzed in the intent-to-treat population (all randomized patients), and the incidence of AEs and the use and duration of CIC were analyzed in the safety population (all patients who received treatment). CIC was mandated in all of the studies if the post-void residual (PVR) urine volume was between 200

and <350 mL and the patient complained of symptoms of incomplete bladder emptying, or if PVR was ≥350 mL regardless of symptoms.

RESULTS

Following onabotulinumtoxinA treatment, robust reductions from baseline to week 12 in UI episodes/day were seen across all OAB duration and BMI groups (range: -2.8 to -4.2; Table). Overall, 22.9% to 38.7% of patients across all groups achieved complete continence at week 12, and most patients (range: 62.9%–72.4%) achieved a ≥50% reduction in UI episodes/day at week 12. Regardless of prior OAB duration or patient BMI, substantial improvements from baseline to week 12 were seen in KHQ role and social limitations (range: -20.6 to -27.6 and -19.1 to -25.9, respectively) that were approximately 4 to 5 times the MID (5 points). The majority of patients across all groups achieved or exceeded the MID for KHQ role and social limitations (range: 54.6%–63.4% and 54.2%–66.7%). Across all groups, the proportion of patients with CIC ranged from 2.6% to 6.1% (median duration, 64–120 days). Overall, AE rates were similar across all OAB duration and baseline BMI groups, and urinary tract infection was the most commonly reported AE.

INTERPRETATION OF RESULTS

In this large cohort of patients with OAB who were inadequately managed by an anticholinergic, a robust treatment response was observed with onabotulinumtoxinA across all OAB duration and BMI groups with no clinically meaningful difference apparent across the groups. No unexpected safety signals were observed, and the risk of CIC following onabotulinumtoxinA treatment was low regardless of prior OAB duration or patient BMI.

CONCLUDING MESSAGE

OnabotulinumtoxinA 100U was well tolerated with no change in CIC incidence, and was efficacious, resulting in improved QOL in OAB patients regardless of prior OAB duration or patient BMI.

FIGURE 1

Table: Outcomes at week 12 following onabotulinumtoxinA treatment stratified by baseline OAB duration and BMI

	Baseline OAB duration, y			Baseline BMI, kg/m²			
	<2 (n=279)	2–5 (n=641)	>5 (n=505)	<25 (n=317)	25–<30 (n=454)	30–<40 (n=502)	≥40 (n=153)
UI episodes/day							
Baseline	5.3	5.4	5.6	5.0	5.2	5.7	6.5
Mean change from baseline to week 12	-3.3	-2.9	-3.4	-2.8	-2.8	-3.4	-4.2
Proportion achieving 100% reduction in UI episodes/day at week 12, %	38.7	27.9	27.9	32.5	31.1	29.9	22.9
Proportion achieving ≥50% reduction in UI episodes/day at week 12, %	72.4	62.9	66.9	66.9	65.6	65.1	70.6
KHQ role limitations domain							
Baseline	63.8	60.3	57.6	61.4	59.5	58.1	63.8
Change from baseline to week 12	-27.6	-22.0	-21.2	-24.0	-20.6	-21.7	-26.2
Proportion achieving/exceeding MID, %	63.4	57.1	60.6	62.1	54.6	61.2	62.7
KHQ social limitations domain							
Baseline	51.6	51.3	54.8	49.9	51.4	53.0	60.0
Change from baseline to week 12	-23.5	-19.8	-21.8	-20.3	-19.1	-22.3	-25.9
Proportion achieving/exceeding MID, %	58.4	56.8	58.8	54.9	54.2	60.0	66.7
Incidence of CIC, %	6.1	4.4	5.0	4.7	5.3	5.4	2.6
Median CIC duration, d	64	74	68	64	68	74	120

REFERENCES

1. Nitti VW, et al. J Urol. 2013;189(6):2186–2193.
2. Chapple C, et al. Eur Urol. 2013;64(2):249–256.
3. Herschorn S, et al. J Urol. 2017;198(1):167–175.

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OVERLAP OF BOWEL DYSFUNCTION AND URINARY SYMPTOM SEVERITY IN WOMEN WITH OVERACTIVE BLADDER.

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HYPOTHESIS / AIMS OF STUDY

Previous studies have reported overlap of overactive bladder syndrome (OAB) and bowel dysfunction, including Irritable Bowel Syndrome (IBS) and constipation, suggesting a common aspect of pathophysiology. Prior studies however have focused on the presence/absence of symptoms rather than on severity of symptoms. The aim of this study was to determine if women with OAB and bowel dysfunction report more severe lower urinary tract symptoms than those without bowel dysfunction.

STUDY DESIGN, MATERIALS AND METHODS

After obtaining institutional review board approval, we recruited 99 adult women with idiopathic OAB from the Urology clinic and through advertisement, using a score of >= 4 on the OABq-V3 to confirm the diagnosis. Participants completed questionnaires detailing demographic and clinical history as well as urinary symptoms (i.e. OAB questionnaire, ICIQ- Female LUTS) and bowel function (i.e. Rome III questionnaire). For the primary exposure, we categorized women into three groups based on bowel dysfunction, as determined by Rome criteria: none (No BD), functional constipation (FC), and IBS. For the primary analyses, we compared the differences in the summary scores of the OABq and the ICIQ-FLUTS, in addition to individual symptoms, across the primary exposure groups. We also analyzed the associations between OAB symptoms and constipation severity, as measured by the constipation severity score derived from the Rome questionnaire. Statistical tests included chi square analyses and linear regression, with a significance level of 0.05.

RESULTS

Of the 99 women, 58 (59%) reported no bowel dysfunction, 28 (28%) had functional constipation, and 13 (13%) qualified as IBS. Of those with IBS, 9 (69%) had constipation-only or -predominant IBS. Ages, BMI, and the use of anticholinergic, narcotic, anxiety or other pain medications did not differ significantly across the groups (Table 1). OABq symptom scores were significantly higher for both FC and IBS compared to no BD, although not statistically different from each other, even though there was a trend for higher OABq for women with IBS. (Table 2) OAB HRQL was significantly lower for both groups compared to no BD group, and significantly lower for IBS vs. FC. ICIQ FLUTS scores were also significantly higher for IBS compared to FC and no BD. Constipation severity score

was also increased for FC and IBS compared to no BD, but not different from each other. We found a significant association with increased OABq symptom score and increased CSS (beta 1.85, SE .54, p=.001), even with adjustment for age, BMI and medication use.

INTERPRETATION OF RESULTS

Women with OAB and either functional constipation or IBS appear to have more severe OAB symptoms than those without bowel dysfunction. Women with OAB and IBS appear to have more non-OAB and more severe LUTS than those with functional constipation or no bowel dysfunction. There appears to be a positive association between OAB symptom severity and constipation severity.

CONCLUDING MESSAGE

Severity of concomitant bowel and bladder symptoms may not only have implications for OAB patients, but also may suggest underlying pathophysiologic mechanisms

FIGURE 1

Table 1. Demographic and medication information, reported as Mean (SD) or # (%).

	No BD	FC	IBS	P
Age	51.7 (15.4)	49.2 (17.1)	51.5 (11.9)	0.7
BMI	29.6 (7.4)	30.4 (7.4)	34.1 (8.8)	0.1
Medications				
Anticholinergics	12 (21)	7 (25)	2 (15)	0.8
Narcotics	3 (3)	4 (14)	2 (15)	0.2
Anxiety meds	10 (17)	5 (18)	5 (38)	0.2
Other pain meds	8 (14)	6 (21)	1 (8)	0.5

FIGURE 2

Table 2. Urinary symptoms and constipation severity scores. Data reported as mean (SD).

	No BD	FC	IBS
OABq Symptom Score	47.2 (22.3)	57.7 (24.0)^	70.6 (20.3)^
OABq QOL	66.8 (24.9)	53.9 (27.5)^	34.6 (25.2)^*
ICIQ FLUTS	15.2 (6.1)	17.2 (6.9)	25.4 (8.7)^*
ICIQ UI sub	7.8 (7.8)	8.3 (5.2)	12.5 (5.1)^*
ICIQ Void	1.6 (1.7)	2.4 (2.2)	4.2 (2.5)^*
ICIQ Fill	5.8 (2.6)	6.7 (2.8)	8.7 (3.0)^*
CSS	1.7 (1.3)	7 (3.6)^	8.6 (6.3)^

^ denotes significant difference from no BD group
*denotes significant difference between IBS and FC groups

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METABOLOMIC ANALYSIS OF CANDIDATE URINARY MARKERS OF OVERACTIVE BLADDER SYNDROME IN AN AGING FEMALE POPULATION: PILOT PROSPECTIVE STUDY

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HYPOTHESIS / AIMS OF STUDY

Overactive bladder syndrome (OAB) is strongly associated with advanced age and metabolic syndrome. However, the exact events linking these pathologies remain to be clarified. Urinary metabolome is a useful tool to diagnose metabolic alterations that can impact bladder physiology. We aim to identify specific metabolic markers of overactive bladder syndrome (OAB) using urine metabolomics of an aging female population and to correlate potential marker levels with symptom severity.

STUDY DESIGN, MATERIALS AND METHODS

After obtaining the required ethical approval, forty female patients (20 OAB patients and 20 healthy subjects) between the age of 50 and 80 years-old underwent clinical evaluation and lower urinary tract symptoms assessment with validated questionnaires (OABSS, ICIQ-SF, IIQ-7). Patients with cancer, diabetes, pelvic organ prolapse, kidney and liver failure were excluded. Participants completed a 3-day voiding diary and blood sampling. Early morning mid-stream urine samples were collected for urine culture and metabolomics analysis. The urinary metabolome was analyzed by gas chromatography-mass spectrometry (GC-MS) and normalized to creatinine. ANCOVA was performed to control for the effect of age.

RESULTS

Patients in the OAB group had a significant higher mean age, reflecting a higher prevalence with advancing age (56.3 years ± 5.2 control vs 68.9 ± 11.4 OAB, p<0.001). Serum analysis showed higher insulin resistance index (HOMA-IR) and serum urea in the OAB patients, when controlled for age (Table 1). Urine metabolomics analysis showed higher levels of urinary mitochondrial dysfunction (itaconic, malic and fumaric acids), oxidative stress (L-pyroglutamic and -hydroxyglutaric acids), and ketosis (a-hydroxybutyric and a-hydroxyisobutyric acids) intermediates in OAB patients, with values correlating significantly with OAB symptoms assessed by questionnaires (Table 2). Multiple linear regression model showed that age, blood glucose and urine metabolites (malic, fumaric and -hydroxyisobutyric) are significant predictor factors of OAB severity assessed by questionnaire scores.

INTERPRETATION OF RESULTS

The increased incidence of OAB with aging is also associated with increased insulin resistance and metabolic stress, independenty of age. The urine metabolome identified metabolic stress intermediates that correlated with the severity of

OAB symptoms. This association could indicate that the increased level of these metabolites results from OAB, or rather that their production impacts bladder physiology and leads to OAB.

CONCLUDING MESSAGE

This study proposes new urinary metabolites to serve as biomarkers of OAB and explains its link to metabolic syndrome. These metabolites can also help in predicting OAB severity.

FIGURE 1

Table 1: Demographic and blood test variables compared "with control for age":

	Control group	OAB group	Normal valu
BMI (kg/m²)	26.99 (23.91-30.01)	29.43 (26.68-32.17)	18.5 - 24.9
Systolic BP (mmHg)	121.77 (115.0-128.56)	123.17 (116.6-129.7)	90-120
Urea (mmol/L) *	5.042 (4.42-5.67)	6.164 (5.54-6.79)	3.0 -8.0
Creatinine (µmol/L)	63.68 (57.39-69.96)	69.09 (63.411-75.97)	45-95
eGFR (mL/min/1.73 m2)	91.01 (83.1-99.1)	83.08(75.3-90.9)	>60
Na^+ (mmol/L)	141.96 (140.9-143.02)	141.94 (140.9-142.97)	134-144
K^+ (mmol/L)	4.42 (4.23-4.61)	4.67 (4.48-4.86)	3.5-5.5
Cl^- (mmol/L)	102.15 (100.8-103.48)	102.16 (100.87-103-45)	98-108
Bicarbonate (mmol/L)	27.27 (26.33-28.42)	27.5 (26.48-28.5)	22-31
Fasting glucose (mmol/L)	5.83 (5.09-6.56)	5.596 (4.89-6.31)	3.9-5.5
Insulin (pmol/L) *	55.22 (39.79-70.65)	79.9 (64.47-95.34)	15-180
HBA1c	0.057 (0.054-0.059)	0.054 (0.051-0.057)	0.048-0.060
HOMA-IR *	2.13 (1.48-2.8)	3.13 (2.47-3.78)	< 1.9
Triglyceride (mmol/L)	1.115 (0.779-1.45)	1.46 (1.14-1.77)	<2.0
Total cholesterol (mmol/L)	5.22 (4.7-5.73)	5.23 (4.66-5.8)	<5.0
LDL	2.82 (2.26-3.37	3.03 (2.5-3.57)	<3.0
HDL	1.76 (1.5-2.0)	1.57 (0.1.33-1.8)	>1.0
Total Chol/HDL	3.39 (2.82-3.95)	3.37 (2.8-3.93)	<5.0

Values are expressed as adjusted mean for age (95% CI), *p<0.05 one-way ANCOVA

FIGURE 2

Table 2: Urine metabolites (corrected to creatinine): comparison of metabolomics in the OAB and control groups and correlation with symptomatic questionnaires scores

	Metabolite	OAB/CTR*	Correlation to questionnaires#		
			OABSS	ICIQ-SF	IIQ-7
Protein metabolism	Ammonia	0.92			
	Sulfamic	1.03			
	Carbodiimide	0.73			
TCA Intermediates	2-hydroxyglutaric**	1.72			
	a-ketoglutarate	1.26			
	Cis-acotinic	0.97			
	Citric	1.09			
	Fumaric**	1.73	0.401 (0.012)	0.332 (0.048)	0.43 (0.00
	Iso-citric	0.80			
	Lactic	1.43	0.330 (0.049)		
	Malic**	4.80	0.328 (0.042)	0.357 (0.028)	0.37 (0.02
	Pyroglutamic**	1.61			0.50 (0.00
	Succinic	1.33			
Glycolysis	Pyruvic	1			
	Glyceraldehyde	1.40			
	Itaconic**	3.22			
Amino acids	Cyclohexylamine	10.18			
	N-methylproline	0.78			
	Hydroxyisobutyric**	2.38	0.43 (0.047)	0.376 (0.020)	0.42 (0.00
	2-Hydroxybutyric	1.38	0.339 (0.047)		0.49 (0.00
	β-hydroxybutyric**	2.16			
	Aminobutanoic	0.68			
	B-alanine	1.16			
	Proline	1.86			
	β-alanine	1.26			0.35 (0.03
Lipid	Methylsuccinic*	1.12	0.370 (0.024)		0.36 (0.02
	Ethylmalonic	0.93			

*Results are expressed as Ratio of metabolites mean (corrected to age) OAB:CTR, p value for one-w ANCOVA with controlling age , **p=<0.05.
results are shown as r (p value) for correlations between the metabolite and questionnaires scores. Or significant correlations are reported.

Funding Quebec Network for Research on Aging - Incontinence Thematic Group - Quebec, Canada **Clinical Trial** No **Subjects** Human **Ethics Committee Ethics Committee** of the Jewish General Hospital (Montreal-Canada) **Helsinki** Yes **Informed Consent** Yes

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STUDY OF HIGHER THAN 80 YEARS OLD PATIENTS KEEPING FRAILTY UNDER THE THERAPY OF MIRABEGRON FOR OVERACTIVE BLADDER (HOKUTO STUDY)

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HYPOTHESIS / AIMS OF STUDY

Effective management of overactive bladder (OAB) in elderly adults is important. Mirabegron is the first b3-adrenoceptor agonist for OAB treatment. However, there are few studies in mirabegron for very elderly patients."Frail" is defined as a state of vulnerability associated with impaired physical activity, mobility, cognition, nutrition, and endurance(1). The risk of adverse drug reactions increases with increasing patient frailty(2). Here we assessed not only the efficacy and safety but also impact to fraility of mirabegron in very elderly adults (≥ 80 years old) with OAB but also .

STUDY DESIGN, MATERIALS AND METHODS

This prospective, single-arm observational study included patients aged ≥80 years with OAB, as determined by an OAB symptom score (OABSS) total of ≥3 points and an OABSS Question 3 score of ≥2 points. Patients received 50mg mirabegron once daily were evaluated at baseline, 4, 8, and 12 weeks via efficacy endpoints were changes from baseline in OABSS, IPSS, OAB questionnaire (OAB-q), VES-13 (Vulnerable Elders Survey), the Kihon Checklist score. Safety assessments included adverse events (AEs), laboratory tests, 12-lead electrocardiogram, QT corrected for heart rate using Fridericia's correction (QTcF) interval, Uroflowmetry, post-void residual(PVR) volume and MMSE (Mini-Mental State Examination).

RESULTS

A total of 43 patients (80-96 years old, mean 85 years old) were examined. Subjects had high rates of comorbidities and polypharmacy (Table1). OAB symptom scores improved, with significant changes in urgency, incontinence, and total symptom scores (Fig.1). IPSS total, IPSS storage symptom score, QOL index, and the score of OAB-q (symptom bother, Total HRQL, Concern, and Coping) was significantly improved. Mirabegron showed the significant improvement in the score of VES-13 excluding the item of age. There was no significant change in the Kihon Checklist, laboratory tests, QTcF, Uroflowmetry, PVR volume and MMSE. Two participants (4.7%) discontinued the study for adverse events.

INTERPRETATION OF RESULTS

A β3-adrenoceptors agonist, mirabegron, is efficacious and generally well tolerated treatment for OAB in very old population.These results provide important evidence that medically complex elderly individuals with OAB benefit significantly and broadly, such as improving in frail, from treatment with mirabegron

CONCLUDING MESSAGE

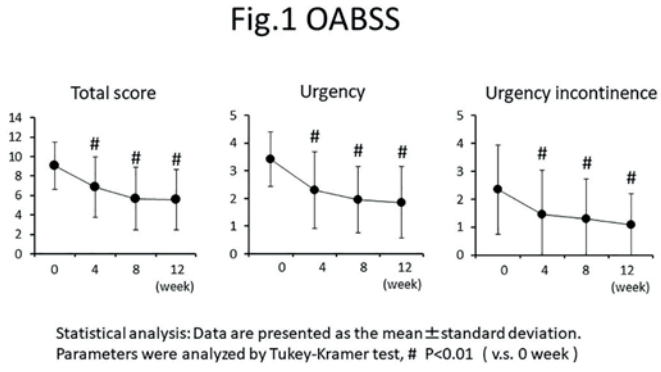
Mirabegron significantly improved OAB symptoms, QOL score, frailty and was generally well tolerated in very elderly patients.

FIGURE 1

TABLE 1. Demographic and baseline characteristics of patients

	All patients (*n*=43)
Mean age (range)	85 (80-96)
No. men (%)	28 (65)
No. women (%)	15 (35)
Mean comorbid conditions (SD)	3.1 (1.7)
Mean concomitant medications (SD)	5.8 (3.4)
Mean Total OABSS (SD)	9.4 (2.5)
Mean Total IPSS (SD)	15.7 (6.4)
Mean QOL score (SD)	4.6 (1.5)
Mean Voiding volume (mL) (SD)	110 (67.4)
Mean Maximum flow rate (mL/sec) (SD)	10.8 (6.6)
Mean average flow rate (mL/sec) (SD)	3.2 (2.1)
Mean Residual urine volume (mL) (SD)	18.8 (15.1)
Mean VES-13score (SD)	5.3 (2.9)
Mean Kihon Checklist score (SD)	7.8 (4.6)
Mean Heart rate (/min) (SD)	65.9 (11.2)
Mean Fridericia's correction (QTcF) interval (m sec) (SD)	419 (25.3)
Mean MMSE (Mini-Mental State Examination) (SD)	26.5 (2.4)

FIGURE 2



Statistical analysis: Data are presented as the mean±standard deviation.
Parameters were analyzed by Tukey-Kramer test, # P<0.01 (v.s. 0 week)

REFERENCES

1. Wynne H, The association of age and frailty with paracetamol conjugation in man. Age Ageing 1990; 19: 419–24.
2. Ruth E. Hubbard, Medication prescribing in frail older people.European Journal of Clinical Pharmacology March 2013, 6: 3, 319–326

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** The ethics committee of the University of Yamanashi **Helsinki** Yes **Informed Consent** Yes

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DO HEALTH DISPARITIES EXIST IN THE INSURED REFRACTORY OAB PATIENT POPULATION?

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HYPOTHESIS / AIMS OF STUDY

Studies suggest racial disparities exist among patients with overactive bladder (OAB). Minority Medicare populations have been shown to be less likely to undergo sacral neuromodulation therapy (SNS) than White patients (1). Our study aim was to determine whether racial disparities exist for any of the third line therapies amongst commercially insured patients.

STUDY DESIGN, MATERIALS AND METHODS

We queried Optum, a national administrative health and pharmacy claims database, between the years of 2003-2016. All patients with non-neurogenic OAB were identified using ICD9 and ICD10 diagnosis codes. Patient demographics and treatment interventions were collected, including oral medication therapies (anticholinergic and beta3 agonists), and advanced therapies (OnabotulinumtoxinA (BTX), SNS, and peripheral tibial nerve stimulation (PTNS)). Multivariate analysis was performed.

RESULTS

2,446,652 patients with OAB were identified. Of these, 519,279 (21.2%) were treated with oral therapies and/or advanced therapies. Of those who were treated, oral medical therapy use was high amongst all races. Regarding advanced therapies, Asians were more likely to undergo BTX than Whites, and Whites were more likely to undergo SNS and PTNS ($p<0.05$). On multivariate analysis, predictors of advanced OAB therapy use were age <65, occupation as a homemaker or retired, education level less than a bachelor's degree and prior oral medical therapy use ($p<0.05$). Male, Asian and Hispanic patients were less likely than their counterparts to undergo an advanced OAB therapy ($p<0.05$) (Table 1).

INTERPRETATION OF RESULTS

In an insured population undergoing advanced OAB therapies, Asians were more likely to undergo Botox, while Whites were more likely to undergo SNS and PTNS. Younger patients (age <65), homemakers/retirees, patients with less than a bachelor's degree and prior OAB oral medication users were more likely to undergo an advanced OAB therapy, while commercially insured males, Asians, and Hispanics were less likely to undergo advanced OAB therapies.

CONCLUDING MESSAGE

While commercial insurance coverage may provide access to advanced therapies, numerous socioeconomic factors appear to drive advanced therapy choices that are not explained by race alone. Further studies are needed to explore these treatment patterns.

FIGURE 1

Table 1: Multivariate Analysis of Predictors of Undergoing Advanced OAB Therapy

Variable		OR	95% CI	P value
Gender	Female	Reference		
	Male	0.93	0.92-0.96	<0.01
Age	≥65	Reference		
	<65	1.23	1.20-1.25	<0.01
Race	White	Reference		
	Asian	0.76	0.72-0.81	<0.01
	Black	1.03	0.996-1.06	0.09
	Hispanic	0.93	0.90-0.96	<0.01
	Other	0.99	0.95-1.04	0.80
Income	≥$100K	Reference		
	<$40K	1.00	0.97-1.04	0.13
	$40K-$49K	0.98	0.94-1.02	0.29
	$50K-$59K	0.99	0.95-1.03	0.64
	$60K-$74K	0.95	0.92-0.99	0.01
	$75K-$99K	1.00	0.96-1.03	0.81
	Unknown	1.19	1.15-1.22	<0.01
Education	Bachelor Degree or more	Reference		
	<12th Grade	1.36	1.22-1.51	<0.01
	High School Diploma	1.16	1.13-1.20	<0.01
	Less than Bachelor Degree	1.06	1.03-1.09	<0.01
	Unknown	1.10	0.97-1.25	0.14
Occupation	Manager/Owner/Professional	Reference		
	Homemaker/retired	1.15	1.09-1.22	<0.01
	Blue collar	0.95	0.89-1.02	0.16
	White collar/health/civil/military	1.00	0.94-1.06	0.89
Use of Oral OAB Medications		1.74	1.71-1.78	<0.01

REFERENCES

1. Laudano MA, Seklehner S, Sandhu J, Reynolds WS, Garrett KA, Milsom JW, Te AE, Kaplan SA, Chughtai B, Lee RK. Disparities in the Use of Sacral Neuromodulation among Medicare Beneficiaries. J Urol. 2015 Aug;194(2):449-53

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** IRB **Helsinki** Yes **Informed Consent** No

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A RELATIONSHIP BETWEEN PRE-DIABETES AND OVERACTIVE BLADDER -ANALYSIS OF A HEALTH-SCREENING PROGRAM IN MEN AND WOMEN-

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HYPOTHESIS / AIMS OF STUDY

To investigate the relationship between lower urinary tract symptom urgency and pre-diabetes in a residential population.

STUDY DESIGN, MATERIALS AND METHODS

A cross-sectional questionnaire survey assessing the role of pre-stage diabetes on OAB was conducted. We collected data on participants aged 40-69 years who participated in a multiphasic health screening, from April 2015 to March 2016, with written informed consent. All participants underwent a detailed health evaluation, including age, body mass index (BMI), blood pressure, a blood laboratory study, and current medical therapies including medication for diabetes, hypertension, and dyslipidemia. A blood laboratory study evaluated FPG level, HbA1c, Triglyceride, and HDL cholesterol. All participants were asked to answer a standardized self-reported questionnaire for OAB screening (SQOAB, Screening Questionnaire for Overactive Bladder). One of the screening questions we used is "It is difficult to hold on when I have the sudden compelling desire to urinate" with a choice of the following two responses: yes or no. Participants who answered 'yes' were identified they had OAB. Baseline characteristics of the study population were calculated both overall and according to categories of with or without OAB. Subjects were stratified into three 10-years age groups (40-49, 50-59, and 60-69 years). Univariate analyses were initially performed to assess the relationships between OAB and the characteristics or associated health factors including FPG and HbA1c. Variables were added simultaneously to multivariable regression models. We report the OR and 95% confidence interval (95%CI) for the multivariable logistic regression, with a p-value of <0.05 regarded as statistically significant.

RESULTS

A total of 6,133 individuals aged 40-69 years were participated in in a multiphasic health screening. Of all participants, we excluded 353 participants with prior diagnosis of diabetes and 9 participants without complete response for the questionnaire, leaving a sample of 5,771 participants (2,298 males and 3,473 females) for analysis. Median age was 65 years. Overall, 189 men (8.2%) and 409 women (11.8%) reported urgency. Multivariate regression showed that even modestly raised FPG (110-125 mg/dL) and HbA1c (5.5-5.9%) levels were independent associated with OAB in women (OR 1.46 (1.04-1.83, 95%CI) compared with FPG <100 mg/dL, and OR 1.31 (1.04-1.65, 95%CI) compared with HbA1c of <5.5%, respectively) (Figure). No statistical difference was found between FPG/HbA1c levels and OAB in men.

Figure.Multivariate analyses of the risk factors for overactive bladder in women.

INTERPRETATION OF RESULTS

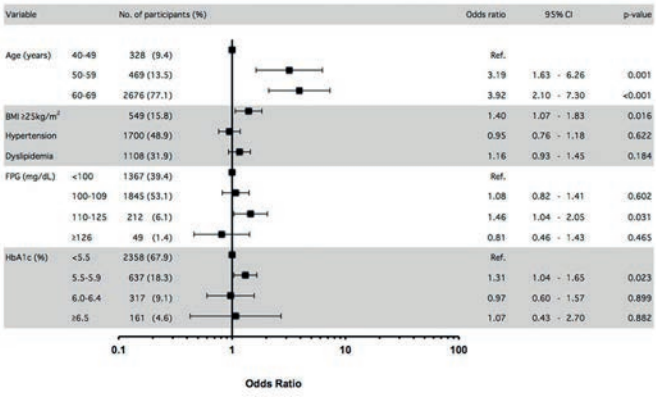
To our knowledge, this is the first study in a population-based sample of men and women to assess the potential role of pre-diabetes in the development of OAB.

In the present study, multivariate analysis showed a statistically significant association between OAB and FPG/HbA1c levels in women, but not in men. These results indicate that bladder storage function may be affected even in pre-diabetes in women.

CONCLUDING MESSAGE

These results suggest that FPG and HbA1c levels were significantly correlated with OAB in women with pre-diabetes. The role of pre-diabetes and the development of OAB should be studied further.

FIGURE 1



Funding KAKENHI **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** The ethics committee of the University of Fukui **Helsinki** Yes **Informed Consent** Yes

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PELVIC FLOOR HYPERTONICITY IN WOMEN WITH PELVIC FLOOR DISORDERS: A CASE CONTROL AND RISK PREDICTION STUDY

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HYPOTHESIS / AIMS OF STUDY

Myofascial pelvic pain is a chronic and debilitating condition, sometimes associated with pelvic floor disorder (PVD). Our aim was to identify risks factors in women with PVD and myofascial pain, compared to controls without pain.

STUDY DESIGN, MATERIALS AND METHODS

This was a case control study (2009-2017) of patients with PFD (POP, UI, or both), and/or who underwent surgery for PVD, and had a diagnosis of hypercontracted pelvic floor. Cases were matched with patients who presented with the same PFD, and/or underwent surgery for the same PFD, but without pelvic floor hypertonicity. Risk factors were compared between groups.

The relationship between patient variables and the presence of hypercontracted pelvic floor in cases vs controls was examined via univariate logistic regression. Firth's penalized likelihood approach was employed to account for low outcome rate for some variable levels. Multivariate logistic regression was then used to examine the impact of these variables on myofascial pain adjusted for each other. Variables with $p<0.05$ in the univariate analysis and/or variables believed to be clinically relevant were included in the multivariate model. We further used stepwise regression with Akaike information criterion to retain variables that were most predictive of postoperative myofascial pain among patients underwent urogynecologic surgery. The estimated regression coefficients from the resulting model were then converted into a scoring algorithm to predict pain. Area under the receiver operating characteristic (ROC) curve was used to assess the accuracy of the prediction model. Among women with pelvic floor hypercontraction, difference in demographic variables between those with urogynecologic surgery and those without was assessed using Chi-square test, Fisher's exact test or t-test as appropriate.

RESULTS

Ninety-five cases with pelvic floor muscle hypertonicity were identified and matched. Sixty-five women suffered from both POP with or without UI and 30 women had UI only. Women sought care for a variety of pelvic floor symptoms. Among cases, 80/95 women (84.2%) presented with symptoms of pelvic pain. Forty-three percent of women with pain had pain alone whereas 57% had pain plus one or more pelvic floor symptoms (in decreasing order of frequency: urinary, bowel and/or prolapse complaints). Fifteen women (15.8%) had hypertonicity without a primary complaint of pelvic pain and instead presented with initial symptoms, in decreasing order of frequency, of urinary, bowel and/or prolapse complaints.

Most women were post-menopausal. Case patients were younger than controls (54 versus 59, p=0.002). On pelvic examination, vaginal atrophy was noted in 42.1% of cases and 45.7% of controls (p=0.616). Among cases, 15 women (15.8%) had provoked vestibulodynia, 81 (85.3%) had levator muscle spasm, 73 (76.8%) had obturator muscle spasm, 40 (42.1%) had coccygeus muscle spasm, 6 (6.3%) had bladder base tenderness and no women had documented increased anal sphincter muscle tone (voluntary or involuntary). Two women (2.1%) had exposure from prior prolapse procedures with synthetic mesh. Eleven women (11.6%) had synthetic suburethral mesh exposure from prior midurethral sling for incontinence.

Overall, univariate analysis showed being younger, having a history of depression, endometriosis, chronic constipation, dyspareunia, fibromyalgia, irritable bowel syndrome, musculoskeletal spine injury (from fall, fracture or motor vehicle accident), pelvic injury, chronic back pain, appendectomy, laparoscopy, hernia repair, back surgery and transobturator midurethral sling for UI to be significantly associated with hypercontracted pelvic floor in cases vs controls (Table 1). Multivariate analysis retained risk factors of decrease in age, history of depression, musculoskeletal spine injury (from fall, fracture or motor vehicle accident) and surgery for UI using a transobturator midurethral sling. Surgery for UI using a retropubic midurethral sling was protective against pelvic floor hypercontraction (Table 1).

Seventy-one percent (n=67) had urogynecologic surgery as a likely trigger for hypercontracted pelvic floor. All presented with subjective complaint of pelvic pain on initial visit. In

the postoperative urogynecology surgery cases, age was not significantly different between cases and controls. Univariate analysis showed a history of depression, chronic constipation, dyspareunia, fibromyalgia, irritable bowel syndrome, musculoskeletal spine injury (from fall, fracture or motor vehicle accident), laparoscopy, back surgery and transobturator midurethral sling for UI to be significantly associated with hypercontracted pelvic floor in cases vs controls (Table 1). Retropubic midurethral sling was protective (p<0.001). In contrast, only the transobturator type of midurethral sling for UI remained a significant risk factor in the multivariate analysis.

Within the group of cases with pelvic floor hypercontraction (n=95), women who did not have urogynecologic surgery as a trigger (n=28) had fewer vaginal deliveries (mean 1.8 vs 2.3, p=0.043), a higher prevalence of interstitial cystitis (14.3 vs 1.5%, p=0.025), more chronic back pain (28.6 vs 9%, p=0.014) and a lesser prevalence of cholecystectomy (7.1 vs 28.4%, p=0.023).

The clinical predictive model for myofascial pain after urogynecologic surgery exhibited excellent predictive accuracy as reflected by the large area under the ROC curve (0.87; 95% CI: 0.80, 0.93). The resulting scoring algorithm from the model has a base score of 4 and assigned probability scores to demographic variables of depression (+3), endometriosis (+7), irritable bowel syndrome (+5) and musculoskeletal spine injury (+5). UI surgery using transobturator midurethral sling was also assigned a probability score of +7. In contrast, UI surgery using retropubic midurethral sling was assigned a protective probability score of minus 3. A total score of 7 or higher translated to an estimated probability of over 50% for persistent postoperative pelvic pain. The scoring algorithm showed good agreement between the observed and estimated probabilities (Table 2).

INTERPRETATION OF RESULTS

To our knowledge, our study is the first to evaluate risk factors for chronic pelvic pain after urogynecologic surgery, and to characterize a patient group with pain secondary to hypercontracted pelvic floor muscles in particular. This case control study of patients with pelvic floor disorder symptoms showed younger patients, with a history of depression, musculoskeletal spine injury and surgery for urinary incontinence using a transobturator midurethral sling to be significantly more at risk for pelvic floor hypertonicity. For example, a patient with a history of depression, endometriosis, irritable bowel and a musculoskeletal back injury from a fall has over 90% probability of persistent postoperative pelvic floor hypercontracted muscles. If hypercontracted pelvic floor is detected at initial assessment, prior to PFD treatment, and the patient desires a midurethral sling, she may choose to delay surgery while undergoing treatments such as pain education, pelvic floor physiotherapy, medications or trigger point injections [1]. The clinicians might attempt to optimize intervention to avoid worsening of pre-existing conditions, or the development/exacerbation of central sensitization with local anesthetic agents and/or neuropathic medications [1].

Weaknesses include the retrospective nature of our research. A further limitation of our study is the variety of different operations undergone by our patients, different surgeons with variable expertise, tissue handling and surgical techniques and materials. Finally, our data collection did not include other factors thought to predispose women to persistent pain, such as genetic susceptibility, preceding experiences of pain in response to other noxious stimuli or detailed psychosocial factors [2].

CONCLUDING MESSAGE

A clinically useful prediction model was developed to direct gynecologic surgeons in patient counselling. Larger prospective study is needed to better characterize the cause and effect relationship between the risks factors and the onset of pelvic floor hypertonicity. For example, risk factors such as back injury, endometriosis, irritable bowel syndrome, spinal injury can contribute and/or are often associated with sensitization of the central nervous system which surgery fibrotic tissue might further exacerbate.

FIGURE 1

Table 1 – Association of risk factors with hypercontracted pelvic floor

Variable	Univariate Odds ratio (95% CI)	P	Multivariate Odds ratio (95% CI)	P
Age (per 10 year decrease)	1.46 (1.14, 1.88)	0.002	1.45 (1.04, 2.07)	0.028
Clinical history				
Depression	3.76 (1.83, 8.23)	<0.001	3.00 (1.03, 9.09)	0.044
Endometriosis	20.98 (2.60, 2719.07)	0.001	8.43 (0.72, 1232.30)	0.099
Chronic constipation	2.47 (1.27, 4.95)	0.008	1.36 (0.51, 3.54)	0.528
Dyspareunia	6.74 (2.32, 26.18)	<0.001	4.22 (0.98, 20.73)	0.053
Fibromyalgia	15.04 (3.68, 137.96)	<0.001	3.79 (0.47, 50.51)	0.225
Irritable bowel syndrome	9.43 (2.21, 87.87)	0.001	5.45 (0.76, 66.55)	0.095
Spine injury	6.59 (2.50, 21.59)	<0.001	4.32 (1.01, 21.26)	0.049
Pelvis injury	6.12 (1.34, 58.32)	0.017	1.48 (0.16, 23.13)	0.744
Chronic back pain	4.7 (1.56, 18.62)	0.005	3.10 (0.70, 15.75)	0.135
Surgical history				
Appendectomy	2.21 (1.01, 5.12)	0.048	1.34 (0.40, 4.40)	0.630
Laparoscopy	3.27 (1.72, 6.44)	<0.001	1.19 (0.47, 2.93)	0.715
Hernia repair	2.65 (1.05, 7.44)	0.039	2.05 (0.54, 7.56)	0.285
Back surgery	4.59 (1.28, 24.32)	0.017	1.22 (0.12, 14.79)	0.864
Anti-incontinence surgery with transobturator midurethral sling	11.41 (4.45, 36.83)	<0.001	8.36 (2.68, 31.32)	<0.001
Anti-incontinence surgery with retropubic midurethral sling	0.20 (0.09, 0.39)	<0.001	0.37 (0.15, 0.86)	0.021

FIGURE 2

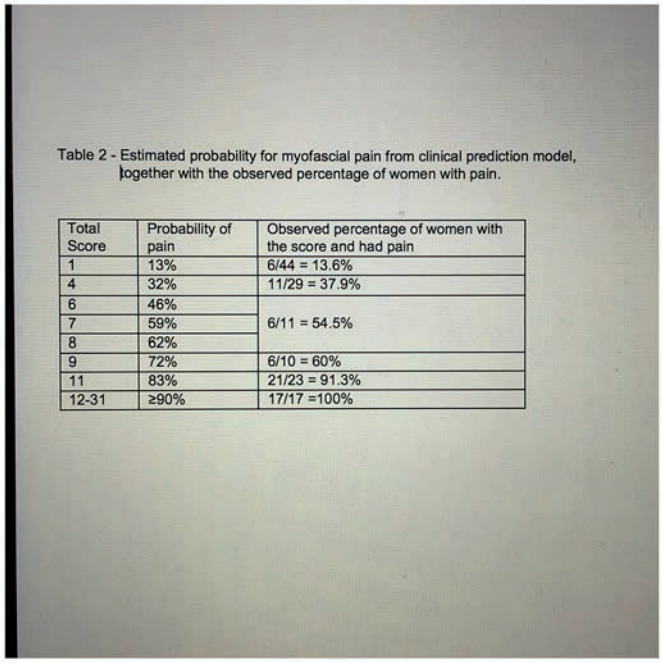

Table 2 - Estimated probability for myofascial pain from clinical prediction model, together with the observed percentage of women with pain.

Total Score	Probability of pain	Observed percentage of women with the score and had pain
1	13%	6/44 = 13.6%
4	32%	11/29 = 37.9%
6	46%	6/11 = 54.5%
7	59%	
8	62%	
9	72%	6/10 = 60%
11	83%	21/23 = 91.3%
12-31	≥90%	17/17 =100%

REFERENCES

1. Butrick, C. Persistent Postoperative Pain: Pathophysiology, Risk Factors, and Prevention. Female Pelvic Medicine & Reconstructive Surgery 22(5), September/October 2016, p 390-396
2. Kehlet H, Jensen TS, Woolf CJ. Persistent postsurgical pain: Risk factors and prevention. Lancet 2006; 367:1618-25

Funding R Ge **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Providence Health Care Research Ethics Board **Helsinki** Yes **Informed Consent** Yes

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THE PSYCHIATRIC IMPACT OF MEDICAL AND OTHER TRAUMA ON ADULT UROLOGICAL PROCEDURES

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HYPOTHESIS / AIMS OF STUDY

Traumatic events experienced in a person's life can have a lasting impact, and should always be considered in the context of clinical medicine. Medical post-traumatic stress disorder (PTSD) is a well-studied reality of modern medicine. In particular, uro-oncological diagnoses and procedures in the adult population have been linked to the development of PTSD (1,2). In urology, we routinely perform invasive procedures on a sensitive area of the body without sedation. Our observation is that patients with post-traumatic stress disorder (PTSD) express more concern regarding invasive testing and urologists may shy away from offering invasive urological procedures for fear of evoking PTSD symptoms. It is unclear what characteristics, such as the type of trauma experienced, influence patient perception of instrumentation. This study seeks to identify characteristics that best predict anxiety and pain when undergoing urologic testing. Equipped with this information, urologists could thereby better identify which patients would have a higher likelihood of an adverse reaction to an invasive test and better prepare for that possibility.

STUDY DESIGN, MATERIALS AND METHODS

Prospective observational trial of 61 sequential patients (average age 55.1 years, 68% female) planned for cystoscopy, urodynamics, or prostate biopsy. Validated measures were completed by patients prior to and during their scheduled procedure. PTSD was assessed by the standardized PTSD checklist (PCL-5), type of trauma experienced by life-events checklist (LEC-5), anxiety levels before and during the procedure by the rapid anxiety assessment scale (RAA) and pain during the procedure (Wong-Baker scale). Patients were stratified into the following 3 groups according to responses on the LEC-5: (1) history of invasive bodily trauma which can include but not limited to surgical or medical management, or sexual abuse, (2) history of other significant trauma which can include fire, car accidents, natural disasters such as floods, or divorce, or (3) no experiences that would qualify the patient for either group 1 or 2.

RESULTS

PTSD patients were identified by a cutoff of ≥33 on PCL-5 as per the National Center for PTSD1 (n=12, all female). PTSD at baseline correlated with anxiety before [$F(1,58)=22.26$, $p=0.00$ $r2=28\%$] and during the procedure [$F(1,57)=20.84$, $p=0.00$ $r2=27\%$]. Level of pain during the procedure did not correlate [$F(1,58)=2.95$, $p=0.091$ $r2=5\%$]. Type of trauma experienced did not correlate with diagnosis of PTSD [$F(2,57)=0.53$, $p=0.595$] nor RAA before [$F(2,57)=1.52$, $p=0.23$] or during the procedure [$F(2,56)=3.04$, $p=0.06$]. However, higher levels of pain correlated with type of trauma experienced [$F(2,57)=3.98$, $p=0.024$] with invasive bodily trauma ($M=3.65$, $SD\ 2.74$) significantly different from no trauma ($M=1.60$, $SD\ 2.96$) as shown in Figure 1. Post-hoc power analysis: With 12 patients in the PTSD group and 48 in the control group, the power was 86% to discover a difference at least as large as 1 within standard deviation.

INTERPRETATION OF RESULTS

PTSD correlated with increased levels of anxiety, but not the level of pain experienced during an invasive urological procedure. There was no evidence that increased patient worry resulted in increased pain experienced. History of invasive bodily trauma was, however, predictive of higher pain levels during the procedure.

CONCLUDING MESSAGE

These findings may inform counseling, preparation/relaxation techniques patients may seek with outside therapist, or help predict indication for sedation. Our recommendations include:

1. Note or screen for a history of PTSD and invasive bodily trauma.

2. Counsel patients that PTSD generally will lead to increased anxiety surrounding the test but not increased pain during the procedure.

3. For patients with PTSD resulting from invasive bodily trauma, acknowledgement that anxiety and pain may be greater. They should be given the opportunity to meet with a therapist prior to plan coping skills.

4. At the very least, handouts for cystoscopy and urodynamics should address increased apprehension (but not pain) in those with general PTSD and increased anxiety and pain in those with a history of PTSD due invasive bodily trauma.

5. Trauma-informed care can put patients at ease.

REFERENCES

1. Bill-Axelson, A., et al. (2011). "Psychiatric treatment in men with prostate cancer--results from a Nation-wide, population-based cohort study from PCBaSe Sweden." Eur J Cancer 47(14): 2195-2201.
2. Maddineni, S. B., et al. (2009). "Identifying the needs of penile cancer sufferers: a systematic review of the quality of life, psychosexual and psychosocial literature in penile cancer." BMC Urol 9: 8.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Research Involving Human **Subjects** Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

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SHORT TERM EFFICACY AND SAFETY OF VAGINAL CO2 LASER IN PATIENTS WITH URODYNAMIC STRESS URINARY INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

Urinary stress incontinence (USI) is a common complaint among women, with an observed prevalence between 4% and 35% (1). The severity of the incontinence varies, and urodynamic stress incontinence is the gold standard of this condition, defined as a finding of involuntary leakage during filling cystometry, associated with increased intra-abdominal pressure, in the absence of a detrusor contraction.

The treatment of USI ranges from conservative treatment with pelvic floor exercises to surgical treatment, such as mid-urethral tapes or retro-pubic procedures. Although the outcome of the surgical procedures are well defined (2), most of the patients are reluctant to undergo surgical intervention to improve their quality of life and are looking for non-surgical options for treatment.

Vaginal laser has recently been introduced as an optional treatment for urinary stress incontinence. The limited studies that were published are lack of urodynamic assessment, and most of them demonstrated significant subjective improvement (3). The objective of this study was to assess the efficacy and safety of vaginal CO2 laser in women with urodynamic stress incontinence.

STUDY DESIGN, MATERIALS AND METHODS

This was a prospective multicenter study. The study protocol was approved by Helsinki committee in each institution, and every patient approved the study protocol by signing informed consent. Patients were eligible to participate if their main urinary incontinence complain was related to stress, had urodynamic stress incontinence and their severity of incontinence was graded as mild or moderate (by Sandvik score). Volunteers were excluded if they had previous anti incontinence surgery, if they had pelvic organ prolapse more than grade 2, or if their BMI was greater than 38. Five patients were excluded during urodynamic assessment due to lack of demonstration of stress incontinence. We used Femilift (Alma Laser, ISRAEL) for vaginal application of pixelated CO2 laser. Every patient had three sessions of vaginal laser treatment through the hole vagina without anesthesia, 4-5 weeks apart, and follow up at 3, 6 and 12 months since treatment began. We used 1-hour pad test (ICS protocol), questionnaires including PFDI-20, PFIQ, Patient Global Impression of Improvement (PGI-I) and a 3-day urinary diary. We present an interim analysis at 3 months follow-up.

RESULTS

We recruited 22 female patients with urodynamic proven stress incontinence, that completed follow-up for 3 months. Urodynamic assessment showed stable detrusor without voiding problem in all patients. The stress related leak was demonstrated either during coughs (mean CLPP=146.9) or Valsalva (mean VLPP=123.2). The patients' mean age was 52.5 (range: 35-73), 36.4% were menopausal, parity was 2.6 (0-4), 13.6% were smoking and their mean BMI was 27.9 (18.4-37.2). No serious adverse events were recorded. Minor side effects that were related to treatment included: transient vaginal secretion (4 patients), vaginal irritation (1 patients), transient fever (1 patient), and UTI (1 patient). The patients' 1 hour pad test, number of incontinence episodes, number of pads used and PGI-I are shown in table 1. Pad test showed significant weight reduction, while 81.8% had pad test lower than 2 gr. 81.8% (18 of 22) of the patients felt improvement at 3 month following the treatment, and 54.5% (12 0f 22) defined it as a significant improvement. Reduction in the number of incontinence episodes and the number of pads used during follow-up did not reach significance. The monthly subjective global improvement is shown in Figure 1.

INTERPRETATION OF RESULTS

This is the first study for assessment of vaginal CO2 laser for patients with urodynamic stress incontinence. The interim results is based on subjective and objective outcome measures, and give us a wide range of patient acceptance of the treatment. The results of this study will enable us to evaluate this treatment option as an adjunct conservative treatment for urinary stress incontinence.

CONCLUDING MESSAGE

Vaginal CO2 laser was found a safe treatment for patients with urodynamic proven stress incontinence. Significant objective and subjective improvement were time dependent and 81.8% reported improvement at 3-month follow-up. The short-term efficacy is promising, however, long term follow-up is needed.

FIGURE 1

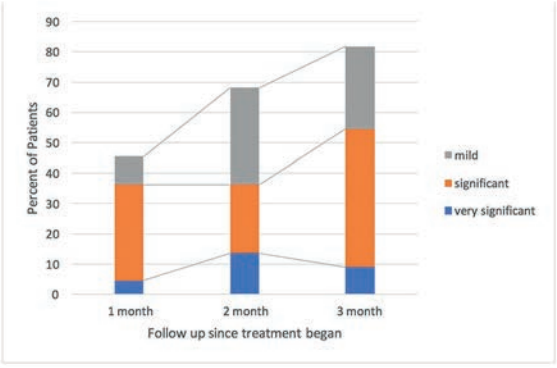
Table 1: Subjective and objective outcome measures of incontinence

	Baseline	1 month	2 month	3 month
1 hour pad test (gr)	9 (0-51)	5.27* (0-45)	4.59* (0-59)	4.22* (0-29)
Number of incontinence episodes / 3 days	5.2 (0-28)	3.9 (0-11)	3.04 (0-12)	2.59 (0-19)
Number of pads / 3 days	5.4 (0-28)	5.7 (0-33)	3.3 (0-14)	2.9 (0-13)
PGI-I (% improved)	-	10 (45%)	15 (68%)	18 (81.8%)

* paired t-test compared to baseline, p<0.05

FIGURE 2

Figure 1: Monthly change in Patient Global Impression of Improvement (PGI-I) following treatment



REFERENCES

1. Luber KM. The definition, prevalence, and risk factors for stress urinary incontinence. Rev Urol. 2004;6 Suppl 3:S3-9.
2. Richter HE, Albo ME, Zyczynski HM, et al. Retropubic versus transobturator midurethral slings for stress incontinence. N Engl J Med 2010; 362:2066.
3. González Isaza P, Jaguszewska K, Cardona JL, Lukaszuk I. Long-term effect of thermoablative fractional CO2 laser treatment as a novel approach to urinary incontinence management in women with genitourinary syndrome of menopause. Int Urogynecol J. 2018 Feb;29(2):211-215.

Funding The study was funded by Alma lasser **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Sheba Medical Center and Poria Medical Center Ethical Commities **Helsinki** Yes **Informed Consent** Yes

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RADIOFREQUENCY FOR THE TREATMENT OF STRESS URINARY INCONTINENCE IN FEMALE: RANDOMIZED CLINICAL TRIAL

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HYPOTHESIS / AIMS OF STUDY

Stress urinary incontinence (SUI) is defined as any involuntary loss of urine in exertion, sneezing or coughing, which affects about 14% to 50% of the female population. Radiofrequency (RF) is a new therapeutic possibility that may aid in one of the pathophysiological mechanisms of SUI which is the decrease of collagen in the urethral walls. Thus, the objective of this study was to verify clinical response, quality of life, sexual function and satisfaction with non-ablative radiofrequency treatment for stress urinary incontinence in women.

STUDY DESIGN, MATERIALS AND METHODS

This is a randomized clinical trial. We included women with SUI (Pad Test> 1g), muscle function ^{3}3 on the OXFORD scale, age range between 30 to 59 years and patients at the Center of Attention to the Pelvic Floor. After the consent, an initial evaluation was made composed by anamnesis, voiding diary, muscle function evaluation (PERFECT), 1 hour Pad Test, and the application of the Female Sexual Function Index (FSFI), the SF-36 questionnaire and the King's Health Questionnaire (KING). The women were randomized into two groups, the radiofrequency group (GR) in which 5 sessions of non-ablative monopolar RF were performed in the external urethral meatus (Figure 1), with a temperature of 39-41ºC for 2 minutes, and the control group (CG) that followed the same protocol, however the RF was switched off and coated with heated glycerin. Both performed home exercises. After a week of the last session of RF were reassessed the Pad Test, questionnaires, muscle function, voiding diary and questioned the participants satisfaction with the treatment.

RESULTS

The sample consisted of 13 women in the GR and 9 in the CG, in which they presented homogeneity in sociodemographic and clinical characteristics. There was a reduction in the variability of urinary loss in GR ($p = 0.04$) with a magnitude of the effect by Cohen's D of 0.960. In the GR, a reduction in urinary loss was observed through voiding diary ($p = 0.025$), increase of strength, endurance, resistance and fastness of the PERFECT scheme ($p < 0.05$ for all) and positive impact of King questionnaire in the physical, social limitation domains, and severity of symptoms ($p < 0.05$). There was no change in

sexual function and quality of life by SF-36. The 11 (88%) GR women reported that they very satisfied.

INTERPRETATION OF RESULTS

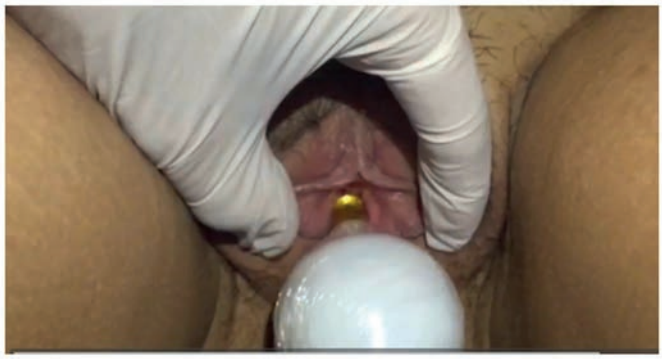
The present study demonstrates a decrease in urinary loss with the use of non-ablative monopolar radiofrequency (RF) in the urethral external meatus, and consequent satisfaction with the treatment of SUI in the short term, without adverse effects.

The criteria used to evaluate the RF clinical response in the short term were Pad Test of one hour, frequency of urinary loss mentioned by the three-day urinary diary and muscle function. All outcomes showed a clinical improvement in RG, indicating a new therapeutic possibility and without adverse effects.

CONCLUDING MESSAGE

Non-ablative radiofrequency in urethral external meatus has been proving to be beneficial in the short-term response of SUI treatment, with reduction of urinary loss and improvement of muscle function. RF had no impact on the general quality of life but in the specific quality of life, it presented positive impacts on the physical, social limitation and reduction of the severity of the symptoms. Women treated with RF were satisfied with the treatment.

FIGURE 1



REFERENCES

1. Lordelo P, Vilas Boas A, Sodré D, Lemos A, Tozetto S, Brasil C. New concept for treating female stress urinary incontinence with radiofrequency. Int Braz J Urol. 2017 Sep-Oct;43(5):896-902. doi: 10.1590/S1677-5538.IBJU.2016.0621
2. Dillon B, Dmochowski R. Radiofrequency for the treatment of stress urinary incontinence in women. Curr Urol Rep. 2009; 10(5):369-74

Funding Foundation for Research Support of the State of Bahia **Clinical Trial** Yes **Registration Number** NCT02617797 **RCT** Yes **Subjects** Human **Ethics Committee** Committee of Ethics and Research of the Escola Bahiana de Medicina e Saúde Pública **Helsinki** Yes **Informed Consent** Yes

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PHYSIOLOGICAL MECHANISMS UNDERLYING THE EFFECTIVITY OF AN INTRAVESICAL BALLOON AS THERAPY FOR STRESS URINARY INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

The current study aims to investigate the potential physiological mechanisms underlying the effectivity of an air-filled intravesical balloon as an intervention for stress urinary incontinence (SUI) in women. Previous studies have indicated that an intravesical balloon alleviates much of the complaints caused by SUI in women [1, 2], but the current study is the first to investigate the in vivo physiological mechanisms underlying this therapy in female SUI patients. The hypothesis of the mechanism of action is that the air-filled balloon would absorb part of the intravesical pressure, thus, reducing the stress incontinence episodes.

We investigated an additional or alternative hypothesis that an intravesical balloon will inwardly push the bladder wall upwards causing the organ to acquire a more vertically oriented shape. This may result in a decreased exposure of the cranial bladder wall to downward pressure and a possible increased exposure of the urethral sphincters to changes in sideways intra-abdominal pressure, which aids the urethral sphincters in successfully preventing the loss of urine during episodes of high intra-abdominal pressure.

STUDY DESIGN, MATERIALS AND METHODS

The current study was approved by the local ethical committee, and informed consent was obtained from each of our participants. We recruited 10 female patients with SUI (mean age: 55.6, SD: 7.8) according to ICS criteria. 6 patients (mean age: 52.5, SD: 4.7) could be evaluated before and after balloon implantation (4 had missing data due to technical difficulties). In order to visualize differences in bladder shape before and after implantation of the intravesical balloon, our participants were subjected to two video urodynamic studies in which the bladder was filled with 100 ml of saline: the first before implantation of the intravesical balloon, and the second one week following implantation of the balloon (fig. 1).

RESULTS

For each video urodynamic study, the maximum bladder diameters in the horizontal and vertical directions were measured and the maximum vertical diameter was expressed as a ratio of the maximum horizontal diameter. Before and after implantation ratios were subsequently statistically compared using a Wilcoxon Signed-Rank Test. Ratios before implantation of the intravesical balloon had a mean of 92.637 (SD: 30.24) and ratios one week following implantation had a mean of 136.605 (SD: 39.784). The difference between the maximum vertical diameter expressed as a ratio of the max-

imum horizontal diameter before and after implantation after the intravesical balloon was significant at the 0.05 level (2-tailed, p = 0.028). Furthermore, after intravesical balloon intervention the participants' average daily pad use decreased from 3 pads per day before the intervention to 1.3 pads per day after the intervention.

INTERPRETATION OF RESULTS

Our results indicate that the shape of the bladder changes significantly after implantation of an intravesical balloon, obtaining a more vertically oriented shape. We propose that this change in bladder shape is an additional contributor to the alleviation of SUI symptoms. Future studies should aim to establish a causal link between bladder shape and sphincter function.

CONCLUDING MESSAGE

Implantation of an intravesical balloon causes the bladder to obtain a significantly more vertically oriented shape. This change in shape may be related to an alleviation of SUI symptoms.

FIGURE 1

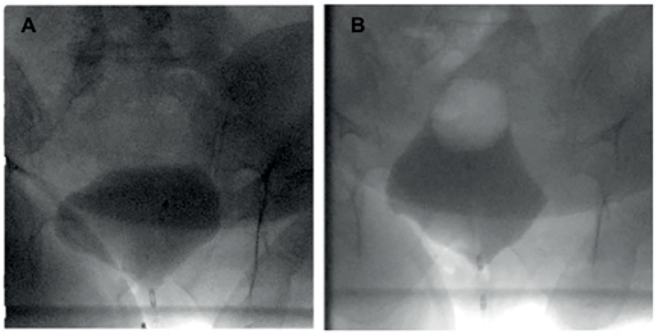

Fig. 1: A: shape of the bladder after infusion of 100 ml saline before implantation of intravesical balloon. B: shape of the bladder after infusion of 100 ml saline after implantation of intravesical balloon.

REFERENCES

1. Wyndaele, J. J., De Wachter, S., Tommaselli, G. A., Angioli, R., de Wildt, M. J., Everaert, K., ... & Van Koeveringe, G. A. (2016). A randomized, controlled clinical trial of an intravesical pressure-attenuation balloon system for the treatment of stress urinary incontinence in females. Neurourology and urodynamics, 35(2), 252-259.
2. Rovner, E., Jacoby, K., Kalota, S., Snyder, J. A., Cline, K., Robertson, K., ... & Zuckerman, J. (2017). Three-month primary efficacy and six-month treatment arm results from the SUCCESS study of an intravesical balloon to treat female stress urinary incontinence (SUI). European Urology Supplements, 16(3), e1504-e1505.

Funding This study was sponsored by Solace therapeutics. **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** METC azM/UM **Helsinki** Yes **Informed Consent** Yes

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SAFETY OF AUTOLOGOUS FASCIAL PUBOVAGINAL VERSUS SYNTHETIC MIDURETHRAL SLINGS

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HYPOTHESIS / AIMS OF STUDY

The autologous fascial pubovaginal sling (AFPVS), long considered the gold standard for the treatment of stress urinary incontinence (SUI) has been largely replaced by synthetic midurethral slings (SMUS) in current practice because SMUS are considered to have less morbidity with equal or better efficacy and have a much shorter learning curve for surgeons to master [1] [2] [3]. The safety of SMUS, though, has been the subject of controversy. The aim of this study is to perform a literature review of the safety of AFPVS and to compare the results to reviews of SMUS.

STUDY DESIGN, MATERIALS AND METHODS

A systematic literature search of PubMed, Science Direct, Web of Science, and articles mentioned in the reference pages, was conducted between March 2017 and September 2017 for English language, full text articles published between 1978 and 2017. The search utilized free text terms on autologous and pubovaginal sling complications. Articles with a follow up less than one year and/or studies on prior synthetic, allograft and xenograft slings were excluded. For complications, there were no exclusions. Complications were limited to serious ones (see table 1). For data analysis, for the numerator, we used the sum of the number of patients cited in each study and, for the denominator, the sum of the total number of patients in each study from which meaningful data could be extracted. For the SMUS comparison we used the data from a literature review that uses the same criteria [2], and for the AFPVS reference, we used evidence-based guidelines for SUI [3].

RESULTS

105 articles were identified that met the inclusion criteria and 44 were excluded, leaving 61 for analysis. The nature and prevalence of complications due to AFPVS and SMUS are depicted in table 1. Range of follow up was 12-190 months. P values were determined using a two tailed Z test and values less than 0.05 are bolded.

INTERPRETATION OF RESULTS

Despite many reports to the contrary, these data do not show a higher rate of serious complications for AFPVS compared to SMUS. Rather, sling erosion, refractory pelvic pain, dyspareunia, de novo overactive bladder (OAB), and bowel perforation are more common after SMUS, while wound complications are more common after AFPVS. Bladder perforation and urethral obstruction are equally common in both procedures. However, the most daunting complications of sling surgery were the unique SMUS complications

- pelvic pain and dyspareunia which were truly refractory in the majority of cases. Because of woefully inadequate follow up studies after treatment of complications, it is not possible to capture the full extent of these complications.

CONCLUDING MESSAGE

SMUS have a complicated safety profile; they are not as safe as are believed and are accompanied with a risk of complications that are unique to mesh slings, including erosions, fistula, dyspareunia and pelvic pain which are often refractory to treatment and lifestyle-altering. Complications after AFPVS surgery are rarely lifestyle-altering in nature.

FIGURE 1

Table 1. Prevalence and complications due to autologous fascial pubovaginal slings (AFPVS) and synthetic midurethral slings (SMUS). P values < 0.05 are bolded.

	Autologous fascial pubovaginal slings (prevalence, %)	Synthetic midurethral slings (prevalence, %)	P value
Total size of cohort	n = 4417	n = 25,586	
Death	2/4417 (0.05)	0/7762 (0)	0.061
Bladder perforation	44/1636 (2.7)	579/19,411 (2.9)	0.503
Bowel perforation	2/4246 (0.05)	6/3822 (0.2)	0.116
Wound complications req. surgery	24/609 (3.9)	NA	NA
Refractory urethral obstruction	76/2235 (3.4)	301/9375 (3.2)	0.653
Erosion requiring surgery	4/4246 (0.09)	333/16,619 (2.0)	**0.000**
Vaginal	3/4246 (0.07)	235/13,705 (1.7)	**0.000**
Bladder	0/4246 (0)	29/13,393 (0.22)	**0.002**
Urethral	1/4246 (0.02)	11/13,628 (0.08)	0.208
De novo OAB	254/2915 (8.7)	1,512/14,765 (10)	**0.012**
Chronic pelvic pain & dyspareunia	22/4246 (0.51)	271/7408 (3.7)	**0.000**

REFERENCES

1. Nager C, Tulikangas P, Miller D, Rovner E, and Goldman H. Position Statement on Mesh Midurethral Slings for Stress Urinary Incontinence. Female Pelvic Medicine & Reconstructive Surgery (2014) 20(3): 123-5.
2. Blaivas, JG, Purohit RS, Benedon, MS, et al. Safety considerations for synthetic sling surgery. Nature Reviews Urology (2015) 12(9): 481-509.
3. American Urological Association (2009). Guideline for the Surgical Management of Female Stress Urinary Incontinence: 2009 Update. Retrieved from https://www.auanet.org/guidelines.

Funding Institute for Bladder and Prostate Research (IBPR) **Clinical Trial** No **Subjects** None

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CLINICAL CHARACTERISTICS OF WOMEN CHOOSING CONCURRENT ANTI-INCONTINENCE SURGERY AT TIME OF HYSTERECTOMY FOR ENDOMETRIAL CANCER

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HYPOTHESIS / AIMS OF STUDY

Stress urinary incontinence (SUI) and endometrial cancer share common risk factors. The surgical treatment of both SUI and endometrial cancer is associated with high success rates and can be performed concomitantly. The aim of this novel study is to describe the clinical and demographic characteristics of women who choose to undergo concurrent anti-incontinence surgery at the time of their hysterectomy for endometrial cancer.

STUDY DESIGN, MATERIALS AND METHODS

This is a secondary analysis of data from the Cancer of the Uterus and Treatment of Incontinence (CUTI) study. CUTI is a large, multi-site prospective cohort study of women with early stage endometrial cancer or hyperplasia undergoing hysterectomy. At the time of their oncology appointment, women were screened for SUI with the question "Do you leak urine with cough, sneeze, jump or laugh?" Women who answered 'yes' were offered enrollment and referral to urogynecology. Women choosing referral to urogynecology were evaluated per standard of care, and depending on clinical diagnosis, were offered treatment for SUI or other pelvic floor disorders at the discretion of the consulting urogynecologist. Validated measures collected from the patients included the Sandvik Severity Index (SSI), Urogenital Distress Inventory (UDI), Incontinence Impact Questionnaire (IIQ) and the Female Sexual Function Index (FSFI). Clinical characteristics and patient-reported outcomes were compared for those choosing concurrent surgical treatment to those who did not.

RESULTS

1,322 women were screened for SUI across eight sites. 702 (53.1%) women screened positive. 556 (79.2%) women enrolled in the CUTI study, 261 (46.9%) opted for urogynecology referral, and 237 completed an evaluation. 102 / 237 (43%) women underwent concurrent surgery. There were no differences in age, race, BMI, insurance status, education, or cancer histology between women choosing concurrent surgery and those who did not. A higher proportion of women choosing concurrent surgery had documented SUI on exam (80.7% vs 19.3%, $p<0.0001$). Women who chose concurrent surgery had higher UDI scores than those who did not (95.9 vs 81.4, $p<0.043$). UDI-stress subscale scores were higher for women who chose concurrent surgery (47.5 vs 35.3, $p=0.0002$), but

irritative scores did not differ between groups (32.6 vs 30.9, p=0.55). IIQ scores were not significantly different between the concurrent surgery vs non-concurrent surgery groups (28.1 vs 22.2, p=0.087), respectively. The two most common reasons for not having concomitant surgery were 'SUI not severe enough' and 'Urge-predominant symptoms.' Only 10 women reported 'Fear of mesh' and 'risk of complications' as reasons for not choosing concurrent surgery. Ten women underwent prolapse surgery in addition to an anti-incontinence procedure; repair of the posterior compartment was the most common prolapse procedure performed (n=8).

INTERPRETATION OF RESULTS
A majority of women with endometrial cancer also report SUI, with nearly 50% choosing evaluation of their urinary leakage prior to their oncology surgery. Clinical findings of SUI and reporting bothersome urinary leakage are associated with choosing concurrent anti-incontinence surgery at the time of hysterectomy for endometrial cancer.

CONCLUDING MESSAGE
Longer-term comparative outcomes on symptom specific and general quality of life will be important to assess.

Funding PCORI - Patient Centered Outcomes Research Institute **Clinical Trial** Yes **Registration Number** ClincialTrials.gov NCT02667431 **RCT** No **Subjects** Human **Ethics Committee** Women & Infants IRB **Helsinki** Yes **Informed Consent** Yes

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THE EFFECTIVENESS OF CBT IN THE SEXUAL FUNCTION AND QUALITY OF LIFE OF WOMEN WITH SEXUAL DYSFUNCTION: A COMPARATIVE STUDY.

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HYPOTHESIS / AIMS OF STUDY
Despite all the initiatives, to demystify the theme of sexuality and many advances, it still remains surrounded by a series of paradigms and taboos in the contemporary, that end up influencing the sexual health of women. Cognitive-behavioral psychotherapy (CBT) is a psychotherapeutic approach that favors the re-structuring of dysfunctional thoughts and beliefs, although it is indicated as effective in the treatment of female sexual dysfunctions, no research has been found to prove its efficacy in this disorder when compared to education sexual. Objective of this study was to analyze the repercussions of Cognitive-behavioral Psychotherapy (CBT) on Quality of Life (QOL) of women with Sexual Dysfunction.

STUDY DESIGN, MATERIALS AND METHODS
A comparative study using the qualitative method and case study design. We included women aged 18-59 years with FSFI, a questionnaire assessing sexual function, less than or equal to 26, and excluded with BECK scores between moderate and severe, patients with other pelvic floor pathologies. The semi-structured interview was used as data collection technique. Control Group (n = 10) patients were submitted to 10 sex education sessions. The patients of the Intervention Group (n = 11) were submitted to 10 sessions of Cognitive-Behavioral Psychotherapy, based on the principles and techniques of CBT2, along with the Sexual Education sessions. 03 categories: Social / leisure area, Body image & self-care and Sexual Function (FS), were analyzed for being considered of greater relevance in the establishment of QoL in the study population.

RESULTS
Intervention Group (n = 11): 11 patients started to include social / leisure activities in their life dynamics. 09 presented changes in the category Body image & self-care, showing more care and satisfaction in the relationship with your body. As for FS, 11 developed the activities of genital self-focusing, 09 began to perform masturbation, 07 reported improvement in FS. Control Group (n = 10): No changes were observed in the Social Area / Recreation category. As for Body Image & self-care, only 01 reported having started genital self-focusing activities. Regarding FS, none of the patients reported improvement. It is important to note that of the 10 patients assigned to the control group, 03 did not complete the protocol.

INTERPRETATION OF RESULTS
Sexuality is an integral part of the quality of life, sexual function being part of this process. In this way it is fundamental that the work with women with sexual dysfunction takes a broader look at the context in which it is uncertain. in this sense, CBT helps women to rescue pleasure in their social life, re-signifies the relationship with their body and genital image, favoring the rehabilitation of sexual function. The improvement of these areas is only possible due to the cognitive restructuring of dysfunctional beliefs about oneself, about the world and about sexual pleasure.

CONCLUDING MESSAGE
The improvement in QoL is attributed to the cognitive restructuring regarding dysfunctional beliefs about sex / sexuality, to the re-establishment of an adequate self-concept and behavioral activation related to social / leisure life, following the principles and foundation of CBT

REFERENCES
1. YILDIZ, G. & CAVKAYTAR,A. Effectiveness of a Sexual Education Program for Mothers of Young Adults with Intellectual Disabilities on Mothers' Attitudes Toward Sexual Education and the Perception of Social Support. - Sexuality and Disability: March 2017, V. 35, Issue 1
2. BUTER,A.; CHAPMAN,J.E.; FORMAN,E.M.;BECK,A.T. The empirical status of cognitive-behavioral therapy: A review

of meta-analyses - Clinical Psychology Review: January 2006, V. 26, Issue 1, Pages 17–31
3. Young, E.J.; Klosko S.J. & Weishaar, E.M. Schema Therapy & - A Practtioner's Guide: 2003, New York & London: The Guijford Press

Funding No **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Committee of Ethics and Research of the Escola Bahiana de Medicina e Saúde Pública **Helsinki** Yes **Informed Consent** Yes

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EFFICACY OF THE SUBURETHRAL TRANSOBTURATOR KIM SYSTEM® FOR FEMALE URINARY INCONTINENCE 10 YEARS AFTER IMPLANTATION

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HYPOTHESIS / AIMS OF STUDY

After the introduction of the transvaginal midurethral synthetic sling in 1996 by Ulmstem, and the description of the transobturator route by Delorme in 2001, the surgical correction of stress urinary incontinence was simplified allowing a minimally invasive approach, being nowadays considered the gold standard for the primary treatment of uncomplicated stress urinary incontinence (UI) without pelvic organ prolapse. However, recent reports of complications with the use of vaginal meshes raise the importance of using biocompatible materials which allow constructive remodelling of host tissues (1), maintaining good continence results.

The aim of this study is to know urinary continence long term results in women who underwent stress UI correction with the transobturator midurethral sling KIM system® (Knotless Incontinence Mesh) with overlock edges.

STUDY DESIGN, MATERIALS AND METHODS

A prospective study was conducted in 744 women who underwent short-stay surgery with the midurethral sling KIM system® for SUI between April 2007 and December 2016.

We distinguish two groups:

* Group A (GA, n=694): continent patients after surgery;

* Group B (GB, n=50): incontinent patients after surgery.

Age, secondary diagnoses, physical examination and complementary explorations, ICIQ-SF questionnaire results at 48h, 3 months and yearly thereafter.

Descriptive statistics, ANOVA analysis, Student's T test, Fisher's exact test are used; $p<0.05$ is considered significant.

RESULTS

Continence was achieved in 93.27% patients. Persistent UI or de novo urgency UI were found in 6.73%. Average age was higher in group B (67. 8 years) than in group A (59.38 years).

Higher evolution time of UI was observed in group B (1976 days) than in group A (1396 days).

Patients had a higher number of eutocic deliveries in group A (1.82) than those in group B (0.86).

The percentage of patients with ASA-I score was higher in group A (41.06%), and the percentage of patients with ASA-III score was higher in group B (46%), representing a better performance status of patients in group A.

No differences between groups were found in: body mass index (GA 28.91, GB 26.92), post-treatment follow-up time (GA: 6.15 years, GB 7.01), food or drug allergies, dystocic deliveries, concomitant treatments which may have an impact on bladder function, smoking, diabete mellitus, ASA-II score.

100% of continence is maintained in the follow-up visits until the fourth year in which it descends to 98%. At 10 years follow-up, 97% of the patients are 100% continent.

INTERPRETATION OF RESULTS

Recognised risk factors for implanted mesh materials are the product design (e.g., physical characteristics of the mesh, size of the pore as a predisposing factor to infection – in particular with a pore size less than 75 microns), and the characteristics of the material (biocompatibility, long term stability, flexibility, elasticity, etc.) (2).

The knotless KIM System® midurethral sling with overlock edges achieves good continence results. Based on our results, younger patients with less comorbidities and a shorter incontinence evolution time have better results. Given that age is a non-modificable variable, it is advisable to perform the anti-incontinence surgery as soon as possible in order to achieve better results. A finding that we believe may be of the greatest importance is that total continence is maintained 10 years after surgery in 97% of women, which shows the efficacy, safety and reliability of the implanted material.

CONCLUDING MESSAGE

The midurethral transobturator sling Kim system® achieves urinary continence results higher than 90%, with 2% recurrence at 4 years and 3% at 10 years. The success of the technique is related to age, incontinence evolution time prior to surgery and patient's general health status.

REFERENCES
1. Gigliobianco G, Regueros SR, Osman NI, Bissoli J, Bullock AJ, Chapple CR, MacNeil S. Biomaterials for pelvic floor reconstructive surgery: how can we do better? Biomed Res Int. 2015;2015:968087. doi: 10.1155/2015/968087.
2. Chapple CR, Cruz F, Deffieux X, Milani AL, Arlandis S, Artibani W, et al. Consensus Statement of the European Urology Association and the European Urogynaecological Association on the Use of Implanted Materials for Treating Pelvic Organ Prolapse and Stress Urinary Incontinence. Eur Urol. 2017 Sep;72(3):424-431. doi: 10.1016/j.eururo.2017.03.048.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** IRB Complejo Hospitalario Universitario de Salamanca **Helsinki** Yes **Informed Consent** Yes

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PREVALENCE AND RISK FACTORS OF POSTPARTUM URINARY INCONTINENCE SIX YEARS AFTER FIST DELIVERY- A PROSPECTIVE COHORT STUDY.

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HYPOTHESIS / AIMS OF STUDY
Our main aim was to explore the prevalence and risk factors of urinary incontinence (UI) six years

after first delivery.

STUDY DESIGN, MATERIALS AND METHODS
Participants in a previous cohort study who gave birth to their first child in two separate hospitals between 2009 and 2010 were contacted in follow-up studies one and six years after their first delivery. Women reported on UI symptoms on the ICI-Q SF questionnaire at both time points. Participants responding at both one and six years after first delivery were categorized into one of two groups, -continent or experiencing UI six years after first delivery (ICI-Q SF >=1). Prevalence of UI with 95% confidence interval was calculated. The chi-squared test or Mann-Whitney U test was used to compared background data as appropriate, and the Student´s t-test for paired data was used to compare ICI-Q mean scores at both time points. Multiple logistic regression analyses were applied to explore possible risk factors for UI six years after first delivery.

RESULTS
Of the 1031 women responding one year after first delivery, 615 (60%) responded at six years. Mean age among all participants at one year was 28.2 (SD: 4.5) years. There was no significant difference between non- responders and responders at six years after delivery with regards to mean age, mode of first delivery, grade of perineal tear at first delivery, and total ICI-Q score at one year after first delivery. However, there was a significant difference in educational level and marital status (p=<.001). A total of 55 % of the women participating six years postpartum reported UI, as compared to 38% one year postpartum. Within the group reporting UI six years postpartum, there was a significant increase (p=<.001) in mean ICI-Q score from 3.2 points (SD: 3.6) one year postpartum to 5.6 points (SD: 5.0) five years later. Six years after first delivery, one in four of the incontinent women (26%) reported low UI (ICI-Q score 1-3 points), 66% moderate UI (ICI-Q score 4-5 points) and 34% high UI (ICI-Q score 6 points and above). In addition, more women in the UI group had higher severity of UI one year after first delivery as well vaginal or instrumental first deliveries, whilst the continent group had more caesarean sections (Table 1). The UI group performed significantly more pelvic floor muscle training (PFMT) than the continent group (p<.05), and there was a significant association between experiencing UI and PFMT at six years after first delivery. Furthermore, UI symptoms one year after first delivery was associated with an increased risk for UI five years later (Table 2).

INTERPRETATION OF RESULTS
The prevalence of UI increased significantly from one to six years after first delivery, and more than 50% reported long term UI. Women experiencing UI one year after first delivery were at increased risk of UI five years later, and women with high symptom severity was at higher risk of long term UI compared to women reporting low or moderate symptom severity. Women experiencing UI were 60% more likely to perform PFMT weekly or more than continent women.

CONCLUDING MESSAGE
The results in the present study indicate that the prevalence of postpartum UI increases in the long term, and more than half of the participating women reported UI six years after their first delivery. The severity of the UI varies, however high symptom severity one year after first delivery is associated with a higher risk for UI five years later.

FIGURE 1

Table 1: Demographic and delivery-related characteristics for participants six years after first delivery according to incontinence status, n=615

	Continent 6 years after first delivery (n= 269)	UI 6 years after first delivery (n= 346)
Late pregnancy		
Age, mean years (SD) [range]	29.0 (4.0) [18.8, 39.3]	29.3 (4.3) [18.8, 42.3]
Primary or secondary education	54 (20.0)	77 (22.3)
Higher education	207 (77.0)	260 (75.1)
Missing	8 (3.0)	9 (2.6)
Married/ living with partner	262 (97.4)	338 (97.7)
Single/divorced/widowed	7 (2.6)	8 (2.3)
First delivery		
Mode of delivery		
Vaginal delivery	169 (62.8)	242 (69.9)*
Caesarean section	55 (20.4)	33 (9.5)*
Instrumental delivery	45 (16.7)	71 (20.5)*
Perineal tear grade 0-2	259 (96.3)	327 (94.5)
Perineal tear grad 3-4	10 (3.7)	19 (5.5)
One year after first delivery		
ICI-Q score 1 year postpartum, mean years (SD) [range]	0.62 (1.9) [0,14]	3.2 (3.6) [0,16]
Severity of UI symptoms		
No UI / continent	234 (87) [0]	143 (41.3)*
Low UI, ICI-Q SF score (1-3 points)	12 (4.5)	60 (17.3)*
Moderate UI, ICI-Q SF (4-5 points)	15 (5.6)	60 (17.3)*
High UI, ICI-Q SF (6 points or more)	8 (3.0)	80 (23.1)*
Missing	0	3 (0.9)*
Six years after first delivery		
Primipara	59 (21.9)	61 (17.6)
Multipara	210 (78.1)	284 (82.1)
No pelvic floor muscle training	166 (61.7)	171 (49.4)**
Pelvic floor muscle training weekly or more	90 (33.5)	154 (44.5)**
Missing	13 (4.8)	21 (6.1)**
ICI-Q score 6 year postpartum, mean years (SD) [range]	0	5.6 (5.0)[1,20]*

Results are presented as numbers(%) unless otherwise stated; *=p<.001; **=p<.05

FIGURE 2

Table 2. Risk factors for experiencing urinary incontinence six years after first delivery, results from multivariate logistic regression analyses, n=615

	Urinary incontinence		
	OR	95% CI	p
Pelvic floor muscle training weekly vs. no training	1.6	1.1-2.4	.01
No UI / continent, ICI-Q SF score (0 points)	1		
Low UI, ICI-Q SF score (1-3 points)	8.6	4.3-17.0	<.001
Moderate UI, ICI-Q SF (4-5 points)	5.5	3.0.-10.2	<.001
High UI, ICI-Q SF (6 points or more)	18.2	8.1-40.7	<.001

Funding Self-funded **Clinical Trial** Yes **Registration Number** clinicaltrials.gov (NCT02792244) on June 6th, 2016 **RCT** No **Subjects** Human **Ethics Committee** Approved by the Norwegian Regional Committees for Medical and Health Research Ethics Central (No.2016/280/REK Midt) on April 1st, 2016. **Helsinki** Yes **Informed Consent** Yes

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CHARACTERIZATION OF CELLS ISOLATED FROM SUBURETHRAL MUCOSA OF WOMEN WITH STRESS URINARY INCONTINENCE (SUI) AND PELVIC ORGAN PROLAPSE (POP). A COMPARATIVE STUDY

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HYPOTHESIS / AIMS OF STUDY

Urinary incontinence (UI) in women is a common and costly problem. Stress urinary incontinence (SUI) happens when a physical movement or activity places pressure or stress over the bladder, and the anatomic structures which maintain continence –urethral sphincter, urethra, pelvic floor muscles and so on- are unable to counteract it. In this way, SUI occurs when the pelvic floor muscles and the muscles of the urinary sphincter weaken. Pregnancy, vaginal delivery, being overweight and age are some of the related risk factors to develop SUI.

Some authors have proposed that pelvic floor tissues of women with SUI are altered, not only at an anatomical way, but also, at a cellular and a molecular level. Due to the alterations observed in SUI patients, there should be some mechanisms of reparation. When a tissue is injured, a sequence of overlapping phases takes place to repair the injured tissue. Tissue repair occurs in three phases, the inflammatory, proliferative, and remodeling phases. Myofibroblasts play a crucial role in tissue repair. Myofibroblasts are found, in both, the proliferative and the remodeling phases playing an important role in producing extracellular matrix, including collagen. Myofibroblast are defined as fibroblast-like cells that express α-smooth muscle actin (α-SMA). However, except for the contractility of myofibroblasts, functional similarities and differences between fibroblasts and myofibroblasts have not been fully elucidated. Moreover, myofibroblasts have morphological characteristics similar to those of both fibroblasts and smooth muscle cells.

Our aim was to isolate and characterized individual populations of myofibroblast cells in culture from the suburethral mucosa of patients with stress urinary incontinence (SUI) and pelvic organ prolapse (POP) without SUI and to analyze the possible differences between them in both populations.

STUDY DESIGN, MATERIALS AND METHODS

Patients were recruited at the Department of Obstetrics and Gynecology from the Hospital. Informed consent was approved by the Ethics Committee and after informed consent was obtained, biopsies were collected from both groups of patients.

Myofibroblast cell cultures were established from suburothelial layer (1 cm x 0.5 cm) by mincing the tissue with 0.25% trypsin-EDTA with 0.15% collagenase type II for 30 min at 37ºC. Cells were pelleted at 1500g for 10 min and resuspended in DMEM with 10% fetal bovine serum. Culture medium was changed every 3 days. Cells were counted at different passages and the number of accumulated cell number was calculated. The expression of several genes was analyzed by quantitative real-time PCR in alternate passages during the expansion culture, from passage 3 to passage 11. Immuflorescence technique was analyzed the presence of α-SMA protein in early (p3), intermediate (p7) and late (p11) passages. Total fluorescence per cell was calculated using the Image J software. An average of 12-15 photos were analyzed for each passage. To calculate the corrected total cell fluorescence (CTCF) we used the formula CTCF = Integrated Density – (Area of selected cell X Mean fluorescence of background readings).

Data are expressed as means ± SEM or SD. Statistical differences between experimental groups were determined by Student's t test (unpaired, two-tailed). A p value of less than 0.05 was considered significant. Prism 6.0 (Graphpad) was used for statistical analyses.

RESULTS

The results showed that the suburethral myofibroblasts isolated from the mucosa of patients with SUI or POP have different growth capacity (Figure 1). Besides, the expression of genes and proteins characteristic of the myofibroblasts was also different in the two types of patients (Figure 2). α-SMA positive cells were observed by immunofluorescence in myofibroblast cell culture of SUI patients (Figure 3A). The total cell fluorescence (CTCF) showed that SUI patients have higher number of α-SMA positive cells and the fluorescence was significantly higher than the CTCF from POP patients (Figure 3B).

INTERPRETATION OF RESULTS

POP myofibroblasts have significantly higher growth capacity than SUI myofibroblats suggesting differences between the two populations of cells.

Desmin, CD90 and α-SMA are characteristic genes of myofibroblasts. SUI patients present an elevated expresión in these genes compared to POP patients. CD90 is a marker for a variety of stem cells suggesting that SUI patients have a population of de-differentited cells, the myofibroblast. These myofibroblasts are probably involved in the pathology of the disease and are trying to repair the injured tissue.

Isolated cells from SUI patients have a bigger number of positive α-SMA cells as observed by immunofluorescence. In addition, the fluorescence of the positive cells was more intense as calculated by Image J, indicating a higher presence of the protein inside of the cells. These results suggest that these cells are myofibroblasts compared to cells isolated from POP patients where cells seem to have a morphology more similar to fibroblasts.

CONCLUDING MESSAGE

These findings could be important in order to achieve a better understanding of the mechanism involved in the pathogenesis of SUI in women, and in the physiological ways of restoration of continence. Perhaps these ways could be effective in some patients, but not in others –spontaneous regression of SUI has been described- but this needs to be elucidated.

FIGURE 1

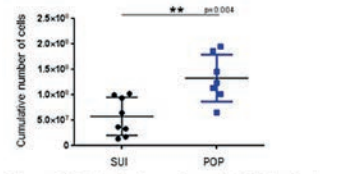

Figure 1.- Myofibroblasts growth capacity. Myofibroblasts were isolated from patients with stress urinary incontinence (SUI) or pelvic floor prolapse (POP). **p=0.004

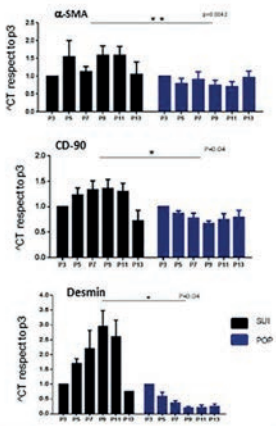

Figure 2.- Gene expression by quantitative real-time PCR on myofibroblasts isolated from patients with SUI or POP. **p=0.0042; *p=0.04.

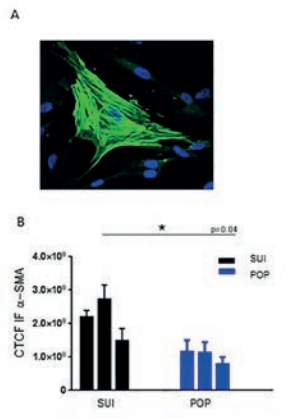

Figure 3.- A) Immunofluorescent staining of α-SMA. Example of a positive cell of a myofibroblast cell culture isolated from a SUI patient. **B)** The corrected total cell fluorescence (CTCF) was calculated in passages p3, p7, p11 of myofibroblasts isolated from patients with SUI or POP. *p=0.04

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PELVIC FLOOR MUSCLE DISPLACEMENT DURING JUMPS IN CONTINENT AND INCONTINENT WOMEN: AN EXPLORATORY PILOT STUDY

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HYPOTHESIS / AIMS OF STUDY

Urinary incontinence is worldwide a major problem. Stress urinary incontinence (SUI), defined as the complaint of involuntary loss of urine on effort or physical exertion (e.g. sporting activities), or on sneezing or coughing is the most common form of urinary incontinence especially among younger women. Female athletes report a prevalence of SUI up to 80%, depending on their sports activity, which is highest during high-impact activities, such as jumping or running (1). Ultrasound and magnetic resonance imaging is applicable to measure PFM displacement during voluntary contractions and reflexive tasks like coughing. During a voluntary PFM contraction a cranio-caudal elevation and with coughing a caudal-dorsal descent of the PFMs has been demonstrated (2). High intra-abdominal pressure occurs during sports activities. An intra-abdominal pressure increase will displace the PFMs caudally, which needs to be counteracted by a PFM activity. PFM displacement is increasingly explored during running (3), but has not been investigated during jumps. However, enhanced comprehension of PFM displacement and its related muscle action is clinically relevant for the development of specific approaches in rehabilitation.

The aim of the study was to describe and to compare PFM displacement between women who were continent and women with SUI during jumps before and after initial contact.

STUDY DESIGN, MATERIALS AND METHODS

A cross-sectional, exploratory pilot design was applied. The study was approved by the Ethics Committee of the Canton of Bern, Switzerland (No. 391/14). PFM displacement was assessed in six degrees of freedom with an electromagnetic tracking system (ETS). Data were recorded during 3 drop jumps (DJ) and counter movement jumps (CMJ). An ETS sensor was attached to a vaginal probe. A referential ETS sensor was attached at the second sacral vertebrae. To detect impacts, i.e. ground reaction force (GRF) and related body weight force (BWF) during landing and take-off, a force plate was used. Cranial-caudal translation and forward-backward rotation of the vaginal probe was measured from 30 ms before to 150 ms after ground contact in six 30 ms-intervalls.

RESULTS

Twenty-six continent (CON: 39.3 ± 10.5 years, BMI: 21.5 ± 1.7 kg/m2) and twenty-one stress incontinent (SUI: 45.8 ± 9.9 years, BMI: 21.4 ± 2.0 kg/m2) women were included. Groups differed significantly for ICIQ-UIsf (CON: 1 ± 1; SUI: 7 ±2) and age, but not for Oxford grade and BMI.

Cranial-caudal translation and BWF from 30 ms before to 150 ms after ground contact during first landing is shown in figure 1. Maximal caudal translation (CON: 10.3 ± 7.2 mm, SUI: 13.4 ± 11.8 mm) and maximal cranial translation (CON: 5.0 ± 5.5 mm, SUI: 4.9 ± 5.1 mm) was raised during the first landing of DJ. Maximal caudal translation (second landing DJ: CON: 5.4 ± 8.8 mm, SUI: 5.2 ± 6.1 mm; landing CMJ: CON: 8.3 ± 12.8 mm, SUI: 5.4 ± 5.7 mm) and maximal cranial translation (second landing DJ: CON: 12.2 ± 10.9 mm, SUI: 8.4 ± 7.6 mm; landing CMJ: CON: 9.1 ± 7.3 mm, SUI 11.6 ± 11.3 mm) during the second landing of DJ and landing of CMJ showed more cranial than caudal translation compared to the first landing of DJ, $p<0.05$ (Table 1). Contrary to the translational displacement no differences between jumps and groups could be found for the rotational aspects, showing forward rotation before and backward rotation after landing (before landing: 0.1 to 0.6°; after landing: 1.4 to 10.9°) this for all jumps and groups. The investigation concerning PFM displacement during vertical jumps for CON and SUI showed no significant difference between the groups.

INTERPRETATION OF RESULTS

PFM displacement has been explored during running and demonstrated caudal translation/forward rotation before and cranial translation/backward rotation after heel-strike (3). In this study this mechanism could be seen during the second landing of DJ and the landing of CMJ. During the first landing of DJ a caudal translation/backward rotation has been observed, this may be due to the higher BWF in the first landing of DJ. During coughing the bladder neck displacement has been described in dorso-caudal direction and the ano-rectal angle in ventro-caudal (CON) and dorso-caudal (SUI) direction (2). The ventro-caudal displacement of the ano-rectal angle may be compared to the backward rotation.

CONCLUDING MESSAGE

This study describes kinematic properties during vertical jumps and indicates that during jumps two opposite reactions of involuntary PFM displacement happen, which may provide a better understanding of PFM contraction behavior during impact loads.

FIGURE 1

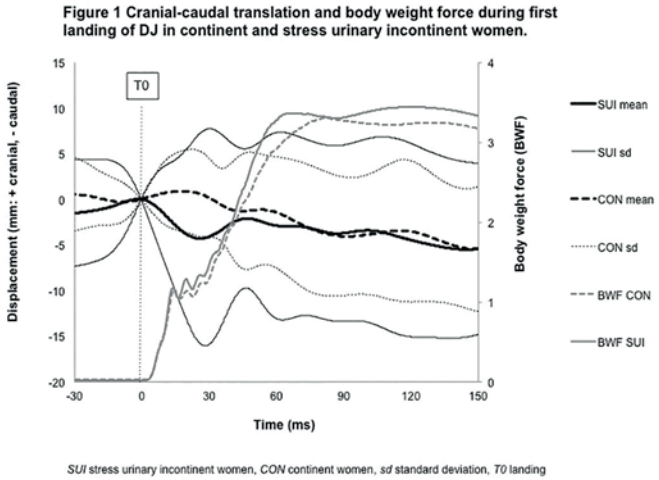

FIGURE 2

Table 1 Descriptive statistics (mean ± SD) for displacement outcomes (translation, rotation) in six time intervals during drop jumps (DJ) and counter movement jumps (CMJ) for first landing and second landing in continent (CON) and incontinent (SUI) women. Translational and rotational maxima (max) and the associated time points (tmax), extracted in a time interval from -30 to 150 ms.

		cranial +, caudal – (mm)		backward +, forward – (°)	
		CON	SUI	CON	SUI
	Variable	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
DJ first landing	-30-0	0,0 ± 2,4	-0.8 ± 4.2	-0.3 ± 0.5	-0.1 ± 0.7
	0-30	0.6 ±3.2	-2.5 ± 6.3	0.5 ± 1.0	0.6 ± 1.3
	30-60	-1.0 ± 5.0	-2.7 ± 8.4	1.4 ± 2.3	2.5 ± 3.0
	60-90	-3.0 ± 6.4	-3.3 ± 9.7	2.4 ± 4.3	4.3 ± 4.6
	90-120	-3.7 ± 6.7	-3.7 ± 10.2	3.3 ± 5.0	5.5 ± 5.2
	120-150	-4.6 ± 6.8	-5.1 ± 9.9	3.8 ± 4.4	5.3 ± 5.3
	max_cranial/backward	5.0 ± 5.5	4.9 ± 5.1	7.0 ± 4.5	7.3 ± 4.2
	tmax_cranial/backward (ms)	80.8 ± 88.4	81.7 ± 100.5	148.5 ± 73.5	121.0 ± 68.9
	max_caudal/forward	-10.3 ± 7.2	-13.4 ± 11.8	-3.0 ± 3.3	-1.8 ± 2.8
	tmax_caudal/forward (ms)	174.1 ± 100.6	158.3 ± 93.0	144.2 ± 133.1	123.1 ± 142.0
DJ second landing	-30-0	0.5 ± 6.0	0.7 ± 2.0	-0.5 ± 0.8	-0.2 ± 0.8
	0-30	1.3 ± 4.0	0.0 ± 2.1	0.3 ± 1.2	1.0 ± 1.6
	30-60	4.8 ± 8.7	2.3 ± 5.4	1.9 ± 3.2	3.9 ± 3.7
	60-90	7.0 ± 10.2	3.2 ± 8.6	3.0 ± 4.8	6.2 ± 5.4
	90-120	6.0 ± 9.6	2.1 ± 8.8	5.0 ± 5.9	8.1 ± 5.6
	120-150	5.1 ± 8.9	1.5 ± 9.7	5.7 ± 6.7	7.8 ± 5.8
	max_cranial/backward	12.2 ± 10.9	8.4 ± 7.6	9.0 ± 4.9	10.9 ± 5.9
	tmax_cranial/backward (ms)	127.8 ± 99.3	115.7 ± 102.6	148.3 ± 75.6	177.5 ± 63.4
	max_caudal/forward	-5.4 ± 8.8	-5.2 ± 6.1	-1.6 ± 4.2	-0.8 ± 1.5
	tmax_caudal/forward (ms)	67.3 ± 73.3	77.8 ± 74.4	45.1 ± 82.6	37.6 ± 76.3
CMJ landing	-30-0	-1.3 ± 3.7	-1.3 ± 3.4	-0.6 ± 1.3	-0.6 ± 0.8
	0-30	-1.4 ± 7.6	0.3 ± 2.1	0.4 ± 1.4	0.8 ± 0.8
	30-60	1.1 ± 10.0	2.4 ± 7.0	1.2 ± 3.2	2.5 ± 3.4
	60-90	3.6 ± 8.0	5.0 ± 7.3	2.2 ± 5.0	3.4 ± 6.6
	90-120	2,4 ± 10.7	5.8 ± 9.9	4.7 ± 5.7	5.4 ± 6.2
	120-150	2.3 ± 8.7	3.1 ± 10.1	5.8 ± 5.4	6.0 ± 6.5
	max_cranial/backward	9.1 ± 7.3	11.6 ± 11.3	9.9 ± 5.5	10.7 ± 9.1
	tmax_cranial/backward (ms)	101.2 ± 95.8	122.5 ± 97.4	203.2 ± 94.9	177.0 ± 86.3
	max_caudal/forward	-8.3 ± 12.8	-5.4 ± 5.7	-1.4 ± 3.4	-1.9 ± 3.9
	tmax_caudal/forward (ms)	50.4 ± 67.8	99.9 ± 105.8	22.2 ± 31.6	22.8 ± 8.6

REFERENCES

1. Goldstick O, Constantini N. Urinary incontinence in physically active women and female athletes. Br J Sports Med. 2014;48(4):296-8.
2. Lovegrove Jones RC, et al., Mechanisms of pelvic floor muscle function and the effect on the urethra during a cough. Eur Urol. 2010 Jun;57(6):1101-1010
3. Leitner M, Moser H, Eichelberger P, Kuhn A, Baeyens JP, Radlinger L. Evaluation of pelvic floor kinematics in continent and incontinent women during running: An exploratory study. Neurourol Urodyn. 2017. https ://doi.org/10.1002/nau.23340

Funding Bern University of Applied Sciences, Department of Health Professions, Division of Physiotherapy, Bern, Switzerland **Clinical Trial** No **Subjects** Human **Ethics Committee Ethics Committee** of the Canton of Bern, Switzerland (No. 391/14) **Helsinki** Yes **Informed Consent** Yes

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BEST VIDEO ABSTRACT

LAPAROSCOPIC TREATMENT OF INTRAPELVIC ENTRAPMENT OF SACRAL NERVE ROOTS BY ABNORMAL PIRIFORMIS BUNDLES CAUSING SCIATICA, PUDENDAL NEURALGIA, PELVIC FLOOR DYSFUNCTION, AND LOWER URINARY TRACT SYMPTOMS

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INTRODUCTION

First described in 1937, piriformis syndrome is caused by abnormal piriformis bundles compressing the sciatic nerve, leading to pain in the buttocks, hips, and/or lower limbs. We present a video of a case of a right-sided intrapelvic entrapment of sacral nerve roots by the piriformis and review our initial results.

DESIGN

A 36 year-old man was seen with a 8-month history of moderate sciatica, describing aching pain in the gluteal region and sharp pain in the lower limbs. Hip abduction aggravated the pain, while ambulating alleviated his symptoms. He denied erectile dysfunction.

Associated urinary symptoms were frequency, urgency, and urge incontinence. Regular medications included pregabalin 75 mg BID and dipyrone 1 g Q6h. Past medical history included dyslipidemia. Examination revealed allodynia in the proximal scrotum, along the S2 dermatome. Urodynamic investigations suggested urinary incontinence due to detrusor overactivity. Magnetic resonance imaging showed an anomalous piriformis bundle compressing L5 to S2 nerves.

RESULTS

Laparoscopy was performed under general anesthesia. After developing the pre-sacral space, an anomalous piriformis muscle bundle compressing the S2 and S3 nerve roots was observed. The muscle fibres were divided, and the right sacral nerve roots then revealed. The previously divided muscle fibres were then mobilized to retract into the deep gluteal space.

Post-operatively, the patient reported full resolution of his urinary and motor symptoms. However, generalized sciatica

occurred at 6 weeks post-operatively due to the retraction of the distal portion of the transected piriformis muscle into the deep gluteal space, which fibrosed and adhered to the sciatic nerve at that level. A second operation was ultimately required, utilizing a transgluteal approach to detrap the sciatic nerve.

Three additional patients underwent a similar operation. Of four patients, the average age was 42.5 ± 11.7 (36 – 60) years, and three (75%) were female. The average time from symptom onset to diagnosis was 6.2 ± 6.2 (0.7 – 15) years, and patients had undergone 1.8 ± 2.1 (0 – 4) surgeries. Prior to our surgery, the VAS score was 9.3 ± 1.0 (8 – 10); however, post-operatively, this decreased to 2.0 ± 1.8 (0 – 4). The average surgical time was 119 ± 39.5 (66 – 161) minutes. None of the other three patients experienced recurrent symptoms or required a second transgluteal approach.

CONCLUSION

Intrapelvic entrapment of sacral nerve roots by abnormal piriformis muscle bundles is a possible extra-spinal cause of sciatica and neurogenic pelvic floor dysfunction that can be treated successfully by laparoscopy.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Case report/series **Helsinki** Yes **Informed Consent** Yes

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ROBOT ASSISTED PUDENDAL NERVE NEUROLYSIS

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INTRODUCTION

Pudendal Nerve Entrapment Syndrome is characterized by neuropatic pain in pudendal nerve territory. This pain can be associated or not with mictional, defecatory and sexual disorders. Nerve surgical descompression is a safe and secure alternative in cases with failure of conservative management. The objective of this video is to describe procedure of robotic pudendal neurolysis step by step.

DESIGN

In this video, robotic assisted surgical technique is described step by step. Left pudendal neurolysis was performed with intraoperative neurophysiological monitoring in a 60 years old patient diagnosed with pudendal nerve entrapment syndrome.

RESULTS

Procedure was completed satisfactory without complications. Hospital postoperative stay was 24 hours. Pain relief was observed with a 50% of pain reduction measured with Visual Analogue Scale 2 weeks after surgery, kept stable 10 weeks after neurolysis.

CONCLUSION

Robotic pudendal neurolysis is a feasible and secure approach, which allows better visualization and accurancy in dissection of PN. Intraoperative neurophysiological monitoring is an useful tool which improve location of PN and detection of intraoperative changes after pudendal nerve descompression.

Funding No funding was received. **Clinical Trial** No **Subjects** Human **Ethics not Req'd** The surgery performed in this video, is a non experimental treatment. **Helsinki** Yes **Informed Consent** Yes

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AN INTUITIVE WAY TO VISUALIZE BRAIN RESPONSE TO BLADDER FILLING

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INTRODUCTION

The brain plays a vital role in the continence mechanism. Its involvement is complex, and our understanding can be confounded by the brain's concurrent involvement in all other physiological processes. We have built our understanding of the brain's role in bladder control upon a series of statistical analyses of activity during bladder-related tasks, yet these findings can be challenging to interpret and envisage, particularly for a non-neuroimaging audience. We sought to find a way to represent brain activity information that would intuitively represent a bladder task, such as filling, to a non-neuroimaging audience. Here we present an analysis of urodynamic bladder filling in an MRI scanner, from empty until strong desire to void, using a tool called 'Regional Homogeneity' (ReHo) [1] which assesses regional brain activation. ReHo evaluates the similarity of the activation pattern of each voxel with its nearest neighbors, essentially producing a map of activation over time which emphasizes robust clusters of activation. Since interpretation of brain imaging studies can be complex, we present our results as a time-lapse video of regional activation (co-occurrence of neighboring voxels) in the brain over the course of bladder filling to allow visualization of brain function and response to stimulus.

DESIGN

Nine women over 60 years of age with urgency urinary incontinence (UUI) greater than five times per week underwent bladder filling at a constant rate of 50ml/minute until they signaled a strong desire to void, while concurrently having a BOLD fMRI scan on a 3T Siemens Trio MRI scanner. ReHo was then calculated for each voxel in the entire brain by calculating Kendall's coefficient concordance (KCC) between neighboring voxels (neighbor was defined as any

voxel that 'touched' a vertex – i.e., 27 voxel neighborhood), which measures the similarity between that voxel and its neighbors. Regions that are more concordant are more likely to have co-activated. We computed this metric over a sliding window of 20 data points – basically allowing us to understand ReHo as a function of time. We computed the average time series across all participants and then visualized the ReHo at the supplementary motor area (SMA), one of the regions of interest widely reported to be involved in the continence mechanism. We calculated ReHo at the last quartile of filling time and compared it to the initial three quartiles in each participant using a paired t-test to quantitatively assess activation changes.

RESULTS

The video shows changes in ReHo occurring concurrently with a constant rate of bladder filling. The SMA activity increases substantially towards the end of filling. Quantitatively, we found that the mean ReHo in the SMA region of interest (MNI 2 0 48) was greater at the last 25% of the filling (mean=0.19, SD=0.01) compared to the first 75% of the filling (mean=0.17, SD=0.02) with $t(9)=-2.44$, $p<0.05$ (95% confidence interval [-0.028, -0.011]).

CONCLUSION

Time-lapse video provides a way to qualitatively assess brain function over time in response to bladder filling; this can provide some context to brain-bladder studies and a useful means of visualizing the brain's role in continence. ReHo is a more complex measure than standard BOLD activation measures since it takes into account clusters of activation (i.e., neighboring voxels which activate together), and does not require a baseline measurement. This video shows that the SMA, known to be part of circuit 2 [2] and involved in urgency, acts as expected and can be visualized. We aim to use this method to both quantitatively assess activity and improve our ability to visualize and contextualize our data in future.

REFERENCES

1. Neuroscientist. 2016; 22(5): 486–505.
2. Journal of Urology 2015; 194(3)708-15

Funding NIH R56 **Clinical Trial** No **Subjects** Human **Ethics Committee** University of Pittsburgh Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

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COMBINED LAPAROSCOPIC AND VAGINAL TECHNIQUE FOR MANAGEMENT OF TENSION-FREE VAGINAL TAPE (TVT) URETHRAL MESH EROSION AND URETHRAL RECONSTRUCTION USING MARTIUS LABIAL FLAP INTERPOSITION

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INTRODUCTION

The tension free vaginal tape was introduced in 1996 (1) and became the standard surgical approach for women with stress urinary incontinence. Late complications such as urethral erosion can be challenging to manage and the incidence of these complications remains unknown. In this video, we demonstrate a novel technique for managing TVT mesh urethral erosion using combined laparoscopic and vaginal approach, followed by urethral reconstruction and Martius labial flap interposition.

DESIGN

A 54 year old diabetic female presented with voiding dysfunction and recurrence of stress urinary incontinence 12 years after retropubic TVT insertion. Cystoscopy revealed TVT urethral erosion into the upper half, and encrustation on the tape. TVT removal was performed using a combined vaginal and laparoscopic approach. Following catheterisation, an inverted U-shaped vaginal incision was made at the level of the mid urethra. The suburethral mesh was not seen or felt and paraurethral dissection was then performed up to the level of the endopelvic fascia. After routine laparoscopic entry, the retropubic space was opened and both arms of the TVT exposed and dissected from the pubic bone all the way down to the endopelvic fascia. The fascia was then perforated vaginally into the retropubic space with curved clamps, and the TVT arms grasped bilaterally and delivered into the vagina. Using the vaginal approach the TVT mesh was then dissected medially towards the urethra at the sites of erosion bilaterally. The ventral aspect of the urethra remained intact and the tape was removed in its entirety by opening the urethra in the lateral wall at the urethral entry points of the tape. Urethrotomy sites were identified and sutured bilaterally with interrupted Vicryl 3-0 sutures.

The left labia majora was then incised and Martius fat pad exposed after dissection of the surrounding fascia using scissors and electrocautery. Blood supply was maintained from the inferior aspect of the flap by preserving a broad inferior vascular pedicle containing blood supply from branches of the pudendal artery. The fat pad was then tunnelled through the left paraurethral space to overlie the urethra and sutured in place with 4 interrupted Vicryl 2-0 to prevent migration. The labia majora was closed in 2 layers. A Foleys catheter remained in situ for 14 days post operatively.

RESULTS
The patient was discharged home after an overnight inpatient stay and with no immediate postoperative complications. At 3 months post operatively the patient reported complete cure of her voiding dysfunction and persistence of the stress incontinence.

CONCLUSION
Recent controversy has brought mesh insertion and removal into the spotlight. Complications such as erosion into the bladder and urethra are rare but difficult to manage. In this video we demonstrate a novel technique for removing TVT mesh to treat urethral mesh erosion with reconstruction of the urethra. This technique has the advantage of being minimally invasive to minimise urethral damage compared to routine midline urethral incision approach. It also allows the tape to be identified and removed even if the TVT cannot be identified or felt vaginally along with complete TVT mesh removal.

REFERENCES
1. Ulmsten U, Henriksson L, Johnson P, Varhos G. An ambulatory surgical procedure under local anaesthesia for treatment of female urinary incontinence. Int Urogynecol J 1996;7: 81–86.

Funding None **Clinical Trial** No **Subjects** None

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A LAPAROSCOPIC APPROACH FOR EXCISION OF URETHRAL EROSION OF MIDURETHRAL POLYPROPYLENE SLING

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INTRODUCTION
Tension-free mid-urethral sling insertion for the management of urinary stress incontinence has serious but rare complications. Urethral polypropylene sling erosion occurs in 0.07-1.5% cases. Various vaginal and cystoscopic techniques have been described for excision of mesh eroding the urethra, including use of cystoscopic trimming(1), or ablation with a holmium laser(2), all of which carry a high risk of recurrence of erosions.

DESIGN
We demonstrate a laparoscopic approach for the complete removal of a mid-urethral retropubic sling eroding into the urethra.

RESULTS
Cystourethroscopy demonstrated polypropylene mesh erosion in to the posterior urethral wall with stone formation over the mesh. There was no bladder erosion identified. At laparoscopy, the retropubic space was opened and bladder reflected to visualise the urethra. The mesh arms were identified bilaterally and dissected down to the level of the urethra. The mesh was removed in its entirety from urethral wall using traction and blunt dissection. The urethra was repaired using monofilament suture. There was no narrowing of the urethral lumen post-operatively and urethral function was preserved. At 2-year follow up cystourethroscopy the bladder and urethra were normal in appearance.

CONCLUSION
We describe a novel case of excision of eroded urethral polypropylene sling via the laparoscopic approach. This patient had a good long term outcome from her surgery, with no recurrence of the erosion, no de novo voiding difficulties, and preservation of the urethral continence mechanism. The laparoscopic approach should be considered as a feasible alternative to a vaginal or cystoscopic approach.

REFERENCES
1. Neurourol. Urodyn. 27, 491–495 (2008)
2. BJU Int. 108, 1472–1478 (2011)

Funding None to declare **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Case report **Helsinki** Yes **Informed Consent** Yes

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LAPAROSCOPICAL REMOVAL OF TRANSOBTURATOR TAPE IN PATIENTS WITH DE NOVO POSTOPERATIVE NEUROLOGICAL PAIN.

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INTRODUCTION
Persistent pain after TVT-O procedure is a rare complication. It is suspected that nerve injuries are a cause of persistent pain. Management of such complications is difficult, and there is no common surgical approach to the task of resolving them. The aim of this video is to provide a step-by-step description of our approach to laparoscopical removal of transobturator tape in patients with de novo postoperative neurological pain.

DESIGN
A 35-year-old woman (G2/P2) was referred to our department one year following transobturator tape procedure with persistent urinary leakage, dyspareunia and pain irradiating to the thigh, with pain increase with sitting. In the upright position the pain ceased. All those symptoms followed the insertion of transoturator tape in 4/2016. Pain disappeared after the pudendal block.

RESULTS
Surgical procedure

Laparoscopy was performed, using a 10 mm port inserted in the inferior edge of the umbilicus to accommodate the laparoscope and three other ports (one 10 mm and two 5 mm). After filling the urinary bladder with 150 ml of sterile saline, the peritoneum was opened and the Retzius space was reached. Tape was identified in the right obturator fossa, and transvaginal palpation helped to identify the course of the tape. The tape was dissected and cut near the obturator muscle, dissected step by step under visual control. The appropriate tension on the dissected tape allowed complete removal of the tape.

Postoperative course

The postoperative course was uneventful. The pain disappeared immediately after the procedure. The patient was discharged from hospital on the second day after surgery. In follow-up visits 3 and 6 months after surgery the patient reported experiencing no pain: the dyspareunia had disappeared, and there were persistent OAB symptoms and partial relief was provided by parasympatholytic treatment (Solifenacin 5 mg). Control urodynamics six months following surgery excluded urodynamic stress urinary incontinence.

CONCLUSION

Aberrant passage of the tape during surgery may induce different types of complications: one of them is persistent pain. Irritation of obturator nerve is generally suggested as the cause of persistent pain. However, in many cases this pain is due to irritation of the pudendal nerve or its branches. Management of the persistent pain after surgery is complicated, and it is recommended to start the treatment with oral analgesics and physical therapy. Tape removal is a secondary option. For patients with a history of persistent pain over 6 months, surgical revision and tape removal should be offered as first-line treatment. The patient is offered transvaginal removal or a combined approach together with thigh dissection; in many cases the transvaginal approach alone is inadequate, and there is likely to be irreversible nerve damage or pain persistence. The transvaginal approach only makes it possible to dissect the tape up to the lateral pelvic wall. This makes the nerve irritation less intensive, but the remnants of the tape are still in contact with the nerve.

Laparoscopy removal is an effective, minimally invasive option for management of persistent pain, especially for patient with pudendal nerve irritation.

Funding No funding **Clinical Trial** No **Subjects** Human **Ethics not Req'd** This is a report of sugical technique **Helsinki** Yes **Informed Consent** Yes

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SELF-LOCKING TRANS-OBTURATOR AUTOLOGOUS FASCIA SLING FOR FEMALE STRESS URINARY INCONTINENCE

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INTRODUCTION

It is reported that the complication rate of female stress urinary incontinence (SUI) patients receiving autologous fascia sling (AFS) was much lower than the group using prolene mesh, in spite of the longer operation time and hospital stay. Nowadays, under the circumstances of decreasing the usage of prolene mesh sling, sling operation with AFS is becoming popular in incontinence surgery in many western countries.1

DESIGN

The video demonstrates the modified AFS surgery for female patient with stress urinary incontinence, instead of using synthetic mesh. Trans-obturator approach was to avoid bladder injury and bleeding, which occurs in traditional pubovaginal fascia sling. Novelty barbed sutures (V-Loc) was used to lock fascial sling in place, to minimize wound size, and for convenient sling tensioning. There are 14 female SUI patients received trans-obturator procedures with AFS from April 2017 to December 2017 in this series.

RESULTS

The mean age of patients was 60.0 years (42-78). There was no intra-operative complication, such as bladder perforations, found during surgery. Follow-up duration is from 3 to 11 months. During the follow-up duration, no post-operative complications were reported. For the time being, the continence rate and total satisfaction rates are 100%.

CONCLUSION

This video revealed that the usage of V-Loc sutures in AFS is one feasible and more straightforward method for urinary incontinence.

REFERENCES

1. Linder BJ, Elliott DS. Autologous transobturator urethral sling placement for female stress urinary incontinence. J Urol. 2015 Mar;193(3):991-6.

Funding Nothing to disclosure **Clinical Trial** No **Subjects** Human **Ethics Committee** Institutional Review Board and **Ethics Committee** of Taipei Veterans General Hospital **Helsinki** Yes **Informed Consent** Yes

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BLADDER NECK THREADS:BNT

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INTRODUCTION
Needle bladder neck suspensions (modified pereyra and stamey type) have been used for a long time with success up to 80% . They are invasive , have many complications and need regional anesthesia at best.

Barbed threads are used in cosmetic facial procedures to lift the cheeks ,neck and eye brows.

We use barbed threads in our center for cosmetic purposes and came up with a new procedure to lift the urethra in an inverted needle insertion technique using the anchorage at the pre pubic periostium.

DESIGN
Patients with stress urinary incontinence have been selected after their clinical assessment ,questionare and urinary voiding charts and consented to have a BNT.

All patients where informed that this is a new pilot study using barb threads instead of the mesh (TVT or TOT) to treat their SUI. They where also aware of the similarity with the pereyra procedure and its published success rates.

The threads where placed in a semi sterile operating room at our center under local anesthesia as shown in the video.

We chose the Bidirectional barb threads to have a better anchorage at each side of the distal urethra totally avoiding any passage under the urethral tissue therefore bypassing all complications like erosions and urinary retention. The prepubic placement avoids bladder injuries and the need for cystoscopy.

RESULTS
BNT seems very promising.

On the first 10 cases that we performed we have had no complications and all patients have reported major improvement in their continence.

3 out of ten patients reported pubic and vulvar discomfort that resolved in a few weeks.

CONCLUSION
This new procedure is simple effective and seems very successful as the barb threads stay in place and their anchors do lift the urethra to its original place.

At one year we do not have any recurring patients and in our opinion a BNT can be added to our armamentarium for mild and moderate S U I.

More cases are needed to check for the longevity and the fibrosis that keep the patients continent.

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** American university of beirut **Helsinki** Yes **Informed Consent** Yes

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ROBOTIC ASSISTED SIMPLE PROSTATECTOMY VIA A POSTERIOR TRANSVESICULAR APPROACH

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INTRODUCTION
Although the gold standard for management of large prostate glands (>90cc) is the open simple prostatectomy, the use of a robotic assisted simple prostatectomy has emerged as a safe treatment option given shorter length of stay and reduced blood loss. The surgical approach traditionally described is similar to that of a radical prostatectomy allowing for surgeon adaptability. We describe an alternative via a posterior transvesicular approach to perform the robotic assisted simple prostatectomy.

DESIGN
The patient was placed in steep trandelenberg position. A 12mm balloon port was used for the camera, three 8mm robotic ports, and two assistant ports (5mm and 8mm). After insufflation, the assistant retracted bowel cephalad. The peritoneum covering the posterior aspect of the bladder was grasped. At this point, a conventional approach includes transecting the median umbilical ligaments at the dome of the bladder to drop the bladder posteriorly. We instead choose to incise the peritoneum and the posterior bladder wall. The bladder had been distended with water. Once inside, we identified the trigone and both ureteral orifices. Two 3-0V lock sutures were used to tack the superior aspect of the cystotomy to the peritoneum to allow for better exposure. We scored the prostate circumferentially and continued to dissect the adenoma from the prostatic capsule and apex. A tenaculum was used to retract the adenoma. The adenoma was placed in an endocatch. A 3-0V lock suture was used for retrigonalization to close the empty posterior fossa by advancing the bladder to the urethra. A foley catheter was replaced. The bladder cystotomy was closed in two layers using a running and an imbricating V lock. The tacking sutures were removed and the peritoneum was closed. The adenoma was removed through the 12mm port site by hubbing the endocatch bag to the skin opening and using a scalpel to morcellate.

RESULTS

We have demonstrated an alternative technique for performing a robotic assisted simple prostatectomy using an approach through the posterior bladder foregoing the need to drop the bladder posteriorly or compromise any vasculature in the anterior prostate. We believe this technique also allowed us for better visualization and control of a very prominent intravesicular anterior component of the prostate.

CONCLUSION

In conclusion, this posterior transvesicular approach provides an alternative method to perform the robotic assisted simple prostatectomy.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Patient consents to use of video for educational purposes **Helsinki** Yes **Informed Consent** Yes

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VICTO AND VICTO PLUS - NOVEL ALTERNATIVE FOR THE MANAGEMENT OF POSTPROSTATECTOMY INCONTINENCE. INITIAL EXPERIENCE AND SURGEON'S PERSPECTIVE

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INTRODUCTION

Artificial hydraulic urinary sphincters (AUS) are the gold standard for the treatment of male stress urinary incontinence. The satisfaction rate is more than 90% however there is still a significant rate of reoperations. The main problems are a sub cuff atrophy and / or an erosion of the urethra. For these cases, adjustment to the lowest pressure are needed to optimize continence status and should assure optimal long term results.

DESIGN

The VICTO adjustable artificial urinary sphincter consists of a urethral cuff, a pressure regulating balloon and a pump, which is equipped with a port for percutaneous adjustment any time after implantation. The system pressure can be adjusted from 0 to 100 cm/H2O. For patients who are unable to interrupt the stream during voiding, VICTO+ is offered with an additional stress balloon which is placed in the preperitoneal region. Thereby abdominal pressure peeks are directly transferred to the urethral cuff. Both versions are delivered preconnected.

The video shows a perineal incision and preparation of the urethra as first step of the surgery. As a second step the musculus bulbospongiosus is divided. Once the urethra is isolated, the circumference is measured. As you can see in the video, positioning and closure of the cuff is easily performed with a mosquito clamp. The pressure regulating balloon is placed intraperitoneally to avoid capsule formation that might influence the system pressure. When using a VICTO+ System, the stress balloon is positioned extraperitoneally. As you can see next the transfer of the preconnected cuff to the perineum is performed using a camera bag and a clamp. The tube to the cuff is parallel to the urethra, thereby avoiding possible oblige forces increasing the risk for erosion. Finally, you see the pump being positioned in the scrotum by blunt dissection and the wounds being closed.

For filling the pump is deactivated using a soft vascular clamp. The filling and evacuation of air can easily be performed using two 10 milliliters syringes, filled with 10 and 3 milliliters for the VICTO and 10 and 10 milliliters for the VICTO+. For both, isotonic contrast medium or saline is used. Air should be removed, however tiny bubbles do not change the function or the pressure.

RESULTS

In the period from December 2016 until October 2017 we implanted 25 VICTO systems. Ten of them VICTO Plus and 15 of them VICTO Systems. During the median follow up of 8.1 months (range 4-14) , we have observed no explantations. In all, there were 1-5 (IQR=1,Median=2) readjustments necessary in order to obtain satisfactory continence status. Perioperatively and postoperatively we have not noticed any serious or major sequellae, requiring further intervention or prolonged hospital stay.

CONCLUSION

Our experience with the possibility of adjusting the system pressure to the lowest level necessary to provide continence are very satisfying. It gives us the preliminary expectation or may fufill our hypothesis, that we will be able to reduce sub cuff atrophy and erosion rates to a minimum. Having zero explantations after one year emphasizes the remarkable safety of this implant and is hardly found in any other hydraulic system.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Institutional board approval **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "URODYNAMICS"

CHANGE OF DETRUSOR CONTRACTILITY IN PATIENTS WITH AND WITHOUT BLADDER OUTLET OBSTRUCTION AFTER OVER TEN-YEAR FOLLOW-UP

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HYPOTHESIS / AIMS OF STUDY

Detrusor contractility is believed to decrease with time. However, longitudinal study of the detrusor contractility after long-term follow-up is rare. This study investigated a cohort of male and female patients who had urodynamic study at baseline and more than 10 years later.

STUDY DESIGN, MATERIALS AND METHODS

A total of 166 patients (49 men and 117 women) without bladder outlet obstruction (BOO) and 63 patients (54 men and 9 women) proven to have BOO who had received urodynamic study at baseline and > 10 years later. Patients who had neurogenic voiding dysfunction, previous pelvic surgery, who underwent lower urinary tract surgery or bladder lesions receiving treatment during the follow-up period were excluded. The urodynamic parameters including bladder first sensation of filling (FSF), full sensation (FS), urge sensation (US), cystometric bladder capacity (CBC), compliance, maximum flow rate (Qmax), detrusor pressure at Qmax (Pdet), voided volume, postvoid residual volume (PVR), bladder contractility index (BCI), and BOO index (BOOI) were compared between baseline and >10 years later.

RESULTS

The changes of urodynamic parameters between baseline and >10 years later revealed that Pdet was significantly decreased and PVR was significantly increased in men and women. FS, US, and voided volume were significantly decreased. BCI was also significantly decreased in men and women (Table 1). When we compared the 49 men without BOO and 54 men with BOO, decrease of Pdet, Qmax, voided volume, and BCI were significantly decreased in both groups. PVR was also significantly increased in both groups and was significantly greater in men with BOO after >10 years (p=0.036) (Table 2).

INTERPRETATION OF RESULTS

Detrusor contractility decreases in men and women after > 10 years follow-up. The decrease of detrusor contractility was similar between men with and without BOO. PVR was significantly increased in men with BOO after >10 years, suggesting a greater degree of urethral resistance in men with BOO after >10 years.

CONCLUDING MESSAGE

Detrusor contractility will decrease with time in both men and women. Men with BOO did not have higher rate of decreased contractility, but PVR increased more than men without BOO.

FIGURE 1

Table 1. The changes of urodynamic parameters between baseline and >10 years later

		Male (n=49)	Female (n=117)	P value
FSF (mL)	Baseline	120.59 ± 57.31	133.56 ± 61.98	0.982
	>10 years	120.76 ± 65.15	134.01 ± 67.54	
FS (mL)	Baseline	214.31 ± 97.33	230.53 ± 87.87	0.427
	>10 years	175.82 ± 88.53	207.26 ± 84.69	
US (mL)	Baseline	296.69 ± 108.95	301.3 ± 103.62	0.104
	>10 years	205.35 ± 103.69	246.3 ± 107.09	
CBC (mL)	Baseline	327.14 ± 131.02	341.7 ± 152.4	0.224
	>10 years	257.43 ± 128.05	309.7 ± 141.0	
Compliance	Baseline	64.32 ± 76.59	79.61 ± 83.03	0.965
	>10 years	61.81 ± 71.68	76.3 ± 79.61	
Pdet (cmH_2O)	Baseline	42.35 ± 26.51	23.11 ± 14.11	0.070
	>10 years	30.57 ± 15.07	17.88 ± 13.18	
Qmax (mL/s)	Baseline	12.27 ± 5.52	15.26 ± 9.19	0.256
	>10 years	8.43 ± 4.09	13.34 ± 10.34	
Volume (mL)	Baseline	295.41 ± 140.26	305.1 ± 139.33	0.265
	>10 years	203.33 ± 123.26	243.2 ± 142.71	
PVR (mL)	Baseline	31.73 ± 42.52	36.58 ± 78.1	0.644
	>10 years	54.10 ± 76.47	66.33 ± 106.89	
BCI	Baseline	103.67 ± 42.29	99.49 ± 46.39	0.041
	>10 years	70.67 ± 26.7	81.17 ± 37.73	
BOOI	Baseline	18.22 ± 27.28	-6.14 ± 24.78	0.403
	>10 years	14.37 ± 18.14	-6.31 ± 22.6	

FIGURE 2

Table 2. The changes of urodynamic parameters between men with and without BOO >10 years later

		Men BOO (n=54)	Men Non-BOO (n=49)	P value
Pdet (cmH_2O)	Baseline	55.6 ± 27.4	42.4 ± 26.5	0.867
	>10 years	42.9 ± 27.3	30.6 ± 15.1	
Qmax (mL/s)	Baseline	10.1 ± 4.07	12.3 ± 5.52	0.585
	>10 years	6.87 ± 4.31	8.43 ± 4.09	
Volume (mL)	Baseline	264.4 ± 129.6	295.4 ± 140.3	0.619
	>10 years	157.3 ± 102.3	203.3 ± 123.3	
PVR (mL)	Baseline	41.1 ± 56.02	31.7 ± 6.07	0.036
	>10 years	103.3 ± 130.1	54.1 ± 10.9	
BCI	Baseline	105.9 ± 32.5	103.7 ± 6.04	0.577
	>10 years	77.3 ± 35.2	70.7 ± 3.81	
BOOI	Baseline	35.3 ± 29.5	18.2 ± 3.90	0.714
	>10 years	29.2 ± 28.4	14.37 ± 2.59	

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Research **Ethics Committee**, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation **Helsinki** Yes **Informed Consent** Yes

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DEVELOPMENT OF A DIGITAL PATIENT-REPORTED OUTCOME MEASURE (PROM) FOR REAL-TIME ASSESSMENT OF OVERACTIVE BLADDER SYNDROME.

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HYPOTHESIS / AIMS OF STUDY

In the current diagnostic process for overactive bladder syndrome (OAB), biased retrospective questionnaires are frequently used. There is a need for a new assessment tool that embraces the heterogeneity of the OAB complex and overcomes the limitations of retrospective questionnaires, including contextual and recall bias. A momentary assessment tool, the digital Experience Sampling Method (ESM), is promising. ESM captures random repetitive measurements during the day, in the context of daily life, and is capable of measuring potential contextual triggers and psychological aspects. The aim of this study is to develop a new patient-reported outcome measure (PROM) for OAB, a smartphone app named 'Uromate', following the FDA guidelines on PROM development (1).

STUDY DESIGN, MATERIALS AND METHODS

'Uromate' was created based on the ESM literature. The development of 'Uromate' consisted of three steps: the development of an initial draft list of questions, a focus group study, and an expert meeting to evaluate which items should be implemented in an urological ESM tool. The initial draft list consisted of questions regarding different domains: somatic items (urological and otherwise), nutrition and drug use, psychological items, and situation and company. Items concerning social factors, contextual and environmental factors and psychological status following the ESM specific construct, were derived from questions used in previous ESM validation studies in the field of Psychiatry and Gastroenterology (2)(3). Urological questions were derived from validated questionnaires (i.e., OAB-q, ICIQ-FLUTS/MLUTS, ICIQ-OAB, KHQoL, BFLUTS, SF-36) and were rephrased to suit momentary assessment. The possible end-points for all items were ranged by use of an 11-points Numeric Rating Scale (NRS), if applicable. The 11-points NRS was chosen based on FDA recommendations (1). Focus group interviews and an expert meeting were conducted to broadly explore the knowledge and experience from patients and experts for item selection, in agreement with FDA guidelines on PROM development (1). The experts in the meeting were specialists in the field of functional urology or other functional disorders including two urologists, a gynaecologist, a gastroenterologist and a hospital psychiatrist.

RESULTS

Thirteen female subjects were present during the focus group meetings, of whom 9 suffered from OAB and 4 from mixed urinary incontinence (MUI) (Table 1). Saturation of input, the point during the study where no new input was brought in, was reached after two meetings.

The majority of patients experienced urgency as an intensified sensation of the normal urge. One patient experienced no urgency but only pain in the lower abdomen prior to urinary leakage. Another patient experienced leakage without prodromal sensations. Urgency to defecate was also incorporated in 'Uromate', since some patients stated that both urinary and faecal urgency occurred simultaneously.

Patients noted that liquid intake, the amount rather than the nature of the liquid, was a very important item. Most patients adjusted the amount of fluid intake when going outside. Coffee or tea were not mentioned as voiding triggers.

Several somatic complaints were included in the proposed list of questions for 'Uromate', such as palpitations, sweating, shortness of breath, dizziness, muscle pain and painful joints. A few patients experienced the whole range of proposed somatic complaints. However, focus group participants could not mention one specific non-urological somatic complaint associated with OAB. Additionally, patients advised to add vaginal pain as a somatic symptom to the list of questions.

Furthermore, patients were asked to point out the least relevant psychological items, leading to a substantially shortened list of items. 'Energetic', 'enthusiastic', 'happy', 'strong', 'worried', 'inspired', 'disappointed', 'insecure' and 'guilty' were removed, because patients found those items not to be associated with OAB.

Situation and company, were very important factors, influencing the psyche and severity of complaints. Patients stated that they felt uncomfortable in situations where people did not show understanding of their urological complaints. They felt that people do not take their complaints seriously.

A morning questionnaire was developed to evaluate the symptom pattern during the night. Participants considered the frequency of awakening and whether awakening was due to urological symptoms the most important.

Initially, sexuality questions were not incorporated, because repeated assessment was not considered useful. Nevertheless, patients missed questions about sexuality in the list of 'Uromate' items. To them, sexuality was an important item, because their sexual functioning was impaired due to OAB complaints. Hence, integration in the morning questionnaire was proposed.

The next step in the development of 'Uromate' was the expert meeting. During this meeting the list of questions was shortened by making sub-questions in the case of positive answers. A validated icon of the Visual Prostate Symptom Score (VPSS) depicting the urinary stream was added. The experts decided to use a validated 4-points urgency scale. Additionally, it was decided to evaluate the degree of untenability as well, using a 11-points NRS. Moreover, there was agreement between experts and focus group participants on merging muscle- and joint complaints together, in order to identify a possible link between OAB and fibromyalgia. Experts decided to add scrotal pain and prolapse sensation as gender-specific questions. Most of the initial psychological items, considering positive affect, were removed during the focus group interviews. However, experts agreed that a couple of positive options must be present in the ESM-questionnaire, whereas otherwise a negative response bias might be introduced. Therefore, the items 'cheerful' and 'relaxed' were kept as positive affect items to maintain an overall neutral question tone. The items 'anxious', 'lonely' and 'nervous' were removed to prevent response fatigue. Carbonated drinks were not incorporated in the questions, because there is little evidence on the association with urinary complaints. Morning questions about sexuality were added, such as pain and urinary urgency and incontinence during intercourse.

INTERPRETATION OF RESULTS

According to patients with OAB, their complaints are influenced by social, contextual, environmental factors and psychological status. This was confirmed in the expert meeting.

CONCLUDING MESSAGE

This is the first report of the development of an urological digital ESM tool, the 'Uromate', which is a newly developed PROM to measure real-time symptoms in the context of daily life. 'Uromate' meets the needs for a modern assessment tool for OAB that overcomes the limitations of today's retrospective questionnaires and captures the heterogeneous, multifactorial character of OAB.

FIGURE 1

Table 1: Patient characteristics of the focus groups participants

	Focus group 1 (n=7)	Focus group 2 (n=6)
Mean age ± SD, years	53.9±6.4	54.5±7.6
Female, %	100	100
OAB wet, n	2	1
OAB dry, n	2	4
Mixed incontinence, n	3	1

REFERENCES

1. U.S. Department of Health and Human Services FaDA, Center for Drug Evaluation and Research (CDER), Center for Biologics Evaluation and Research (CBER), Center for Devices and Radiological Health (CDRH). Guidance for Industry Patient-Reported Outcome Measures: Use in Medical Product Development to Support Labeling Claims. 2009.
2. Vork L, Keszthelyi D, Mujagic Z, et al. Development, content validity, and cross-cultural adaptation of a patient-reported outcome measure for real-time symptom assessment in irritable bowel syndrome. Neurogastroenterology & Motility. 2017.
3. Os J, Verhagen S, Marsman A, et al. The experience sampling method as an mHealth tool to support self-monitoring, self-insight, and personalized health care in clinical practice. Depression and Anxiety. 2017.

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300 www.ics.org/2018/abstract/300

MEDIAN FREQUENCY AND SUM OF AMPLITUDE CHANGES IN RISING SLOPE: TWO POTENTIAL NON-INVASIVE INDICATORS FOR DIFFERENTIATING DU FROM BOO IN MALES

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HYPOTHESIS / AIMS OF STUDY

It remains a challenge to non-invasively differentiate detrusor underactivity (DU) from bladder outlet obstruction (BOO) in males, and the gold standard is pressure flow studies, which is invasive, relatively expensive and may cause bleeding and infection. This novel study aims to non-invasively differentiate DU from BOO in males by analysing urine flow rate curves in the frequency domain. The hypothesis is that underactive patients may perform more abdominal straining than obstructed patients during micturition due to their underactive detrusor. Thus, it is possible to analyse the urine flow rate in frequency domain and derive non-invasive parameters for differentiating these two groups, as abdominal muscle strains in a different frequency range comparing with detrusor contraction [1].

STUDY DESIGN, MATERIALS AND METHODS

Free-flow data of 273 adult male patients who had also undergone PFS were analysed in this research. Based on their PFS record, these patients are divided into three groups: 104 BOO, 93 DU, and 76 normal (DU and BOO disease free) for reference. All free flow data has pre-processed by threshold value of 0.5ml/s for the start and end micturition point [2].

To leave only the fluctuations in the flow curve for analysis in frequency domain, a bandpass Kaiser window filter has been designed and applied on the pre-processed flow data. The selection criteria and specifications for the filter are listed as below:

1. The passband of filter should be flat and ideally without ripples, for the accuracy frequency analysis result.

2. The roll-off should be sharp, for a better filter performance.

3. The group delay response should be a constant value, for shifting back filtered curve with same data sequence length as raw curve.

4. The bandpass range is set to 0.1-1Hz, for maximise reducing fluctuation by detrusor contraction with frequency under 0.1Hz and artefact noise such as coughing.

5. The attenuation is set to -40dB, for reducing artefact fluctuations up to 50ml/s to 0.5ml/s.

Then the sum of amplitude changes is calculated in the filtered flow curve, which is presented as in figure 1.Meanwhile, the frequency spectra of filtered flow curves are generated by fast Fourier transform, and median frequency values are calculated as the frequency value dividing power spectrum into two regions with equal amplitude, which are as presented in figure 2. The filtered flow curve is also divided into two parts by maximum flow rate (Qmax), half of voiding time (Tv), and the location where half of volume is voided, to calculate median frequency in each part.

Figure 1 Raw and filtered curve for sum of amplitude changes in rising slope

Figure 2 Median frequency in whole, 1st and 2nd half Tv filtered curve

All statistical analysis was performed in SPSS version 24, Mann-Whitney U test and T-student test were performed as appropriate. A statistically significant difference was considered as P value<0.05.

RESULTS

We found the significantly statistical difference in sum of amplitude changes in rising slope with P value<0.001, between DU group (mean±SD, 27.4±20.2) and BOO group (mean±SD, 18.3±14.2). Area under the curve (AUC) value is 0.651 in receiver operating characteristic (ROC) analysis, with 63.4% sensitivity and 65.4% specificity. However, no statistical difference is found for differentiating DU from BOO when this parameter takes a ratio to Qmax or volume voided.

In median frequency analysis, the significantly statistical difference for differentiating DU with BOO appear in the filtered whole flow curve (DU vs BOO=0.42±0.10 vs 0.48±0.10) with P value of 0.0001, followed by in the first half volume voided part (P<0.001), ratio of median frequency in 1st to 2nd half part divided by Qmax, (P=0.002), ratio of median frequency in whole filtered curve to 2nd half part divided by Qmax (P=0.003) and median frequency in 1st half part divided by Tv (P=0.004). The AUC value is 0.665 for median frequency in filtered whole flow curve, with 43% sensitivity and 86.5% specificity.

INTERPRETATION OF RESULTS

In this study, we found the flow rate curve fluctuations during micturition in DU patients group have higher amplitude changes than BOO group, and the frequency difference in the whole filtered flow curve. Currently the sensitivity and specificity of these two indicators could not yet exceed those of the simple Qmax cut-off of 10ml/s to select symptomatic men with a high likelihood of BOO, but it still shows promise that these may serve as additional indicator for preliminary screening of DU before invasive pressure flow studies. Furthermore, these indicators could be combined with other non-invasive parameters to enhance current diagnosing accuracy.

CONCLUDING MESSAGE

This study shows promising non-invasive indicators for diagnosing DU in men by analysing urine flow curves in the frequency domain. Further research will explore other possible non-invasive parameters, and mathematically combined with existing indicators for achieving more promising diagnostic accuracy of DU in male.

FIGURE 1

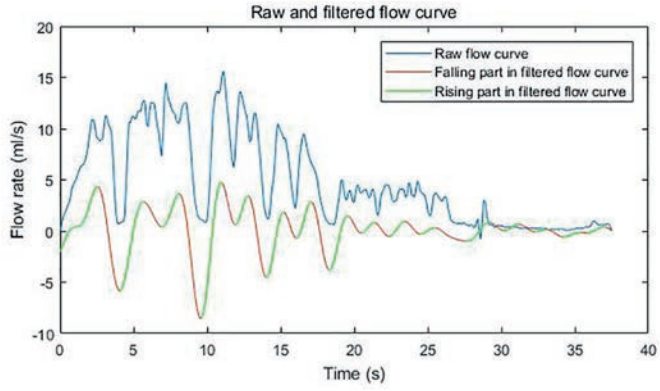
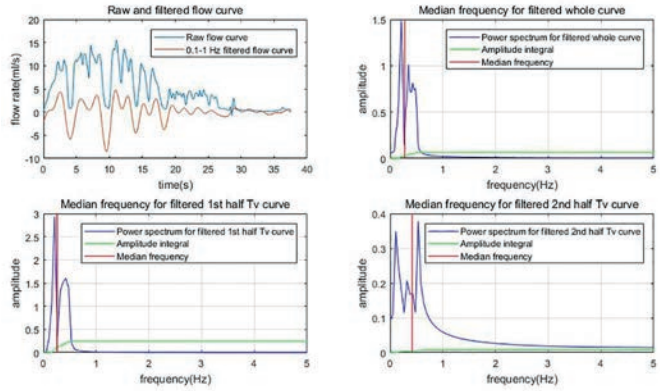


FIGURE 2



REFERENCES

1. Gammie A, Clarkson B, Constantinou C, Damaser M, Drinnan M, Geleijnse G, Griffiths D, Rosier P, Schäfer W, van Mastrigt R, Neurourol Urodyn, 2014;33(4):370-379,
2. Gammie A, Yoshida S, Steup A, Kaper M, Dorrepaal C, Kos T, Abrams P. Flow time and voiding time – definitions and use in identifying detrusor underactivity. Neurourol Urodyn. 2016;35:s68.

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THYROID HORMONE AND LOWER URINARY TRACT SYMPTOMS/ BENIGN PROSTATIC HYPERPLASIA

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HYPOTHESIS / AIMS OF STUDY

Thyroid hormones play an important role in cell differentiation, growth, and metabolism. Several investigators have documented the role of thyroid hormones in the development of prostate cancer. However, to date there are only limited data available regarding thyroid hormone levels in benign prostatic hyperplasia (BPH).

STUDY DESIGN, MATERIALS AND METHODS

A total of 5708 men aged 40 to 59 years who had participated in a health examination were included in the study. Lower urinary tract symptoms (LUTS)/BPH were assessed by international prostate symptom score (IPSS), prostate volume, maximal flow rate (Qmax), and a full metabolic workup. Serum levels of thyroid-stimulating hormone (TSH) and free thyroxine (T4) were measured using chemiluminescence immunoassay by commercial kits. We divided participants into quartiles based on their TSH and free T4 levels: first quartile, Q1; second quartile, Q2; third quartile, Q3; and fourth quartile, Q4. We then investigated their relationship using the chi-squared test, the Cochran-Armitage trend test, logistic regression analyses, and a propensity score matched case-control study.

RESULTS

The mean age of the study group was 51.1 ± 5.2 years, and the mean free T4 and median TSH were 1.05 ± 0.14 and 1.44 (0.96–2.13)ng/mL, respectively. In addition, the ratio of metabolic syndrome and low testosterone (<3.5 ng/mL) were 41.9% and 11.8%, respectively. There was a significant increase in the percentage of men with IPSS>7, Qmax<10 mL/sec, and prostate volume ≥30 mL, with increase of free T4 quartile (IPSS>7(%): Q1:57.2, Q2:56.7, Q3:60.3, Q4:62.5, P=.001; Qmax<10 mL/sec(%): Q1:3.5, Q2:3.2, Q3:4.1, Q4:4.8, P=.038; total prostate volume ≥30 mL(%): Q1:15.2, Q2:16.4, Q3:18.0, Q4:19.3, P=.002). After adjusting for age, body mass index, testosterone, and metabolic syndrome, the odds ratio for prostate volume ≥30 mL of free T4 Q3 and free T4 Q4 were significantly higher than free T4 Q1 [odds ratio; 5-95 percentile interval), P value; Q1:.000 (references); Q2:1.140(.911-1.361), P=.291; Q3:1.260 (1.030-1.541), P=.025; Q4:1.367(1.122-1.665), P=.002]. After adjusting for age, body mass index, testosterone, metabolic syndrome, and prostate volume, the odds ratio for IPSS>7 of free T4 Q4 were significantly higher than that of free T4 Q1 (odds ratio (5-95 percentile interval), P value; Q1:.000 (references); Q2:.969 (.836-1.123), P=.677; Q3:1.123 (.965-1.308), P=.133; Q4:1.221 (1.049-1.420), P=.010). However, the odds ratio for Qmax<10 mL/sec was not significantly different between free T4 quartile groups after adjusting confounding factors. In propensity score matched analysis (matched for age, metabolic syndrome, testosterone, and body mass index at a 1:1 ratio), 1362 cases (Q4 of free T4) and 1362 control subjects (Q1, Q2, and Q3 of free T4) were included for comparison. The ratio of prostate volume ≥30 mL (15.1% vs. 19.3%, P = .004) and mean prostate volume (23.7±6.7 vs. 24.6±7.3 mL, P=.001) was higher in the case group than in the control group. Qmax and IPSS were not different between case and control groups. TSH was not significantly related to IPSS, Qmax, and total prostate volume in univariate and multivariate analyses.

INTERPRETATION OF RESULTS

Prostate volume, IPSS, and Qmax are significantly related to free T4, and prostate volume is significantly and independently related to free T4 in this study.

CONCLUDING MESSAGE

We found a potential role of thyroid hormone in developing BPH.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** National Police Hospital **Ethics Committee Helsinki** Yes **Informed Consent** Yes

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THE TEMPORARY IMPLANTABLE NITINOL DEVICE (ITIND) FOR THE MINIMALLY INVASIVE TREATMENT OF BPH: COMPARISON OF 3-YEAR OUTCOMES & COST IN CANADA

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HYPOTHESIS / AIMS OF STUDY

The iTind (Medi-Tate Ltd.) device, comprised of 3 nitinol struts & an anchoring leaflet, is deployed in the prostatic urethra where it expands, resulting in ischemic incisions & a re-shaping of the bladder neck & prostate. The device is implanted in 5 minutes using a rigid cystoscope. After 5 days it is removed through a 22F catheter. The device is Health Canada approved. Three-year clinical outcomes & economic comparisons are made to the prostatic urethral lift (PUL) system (UroLift - NeoTract Inc.).

STUDY DESIGN, MATERIALS AND METHODS

A one-arm single-centre, prospective study of the iTind in 32 men was conducted. Similarly, the L.I.F.T. study, a multi-centre, sham-controlled prospective study with similar inclusion criteria & outcomes examining the PUL has published its 3yr results.

RESULTS
At baseline patient's mean (SD) total prostate volume (TPV), IPSS score, QoL & Qmax were 29.5 (+7.4), 19 (14-23), 3 (3-4), & 7.6 (2.2) ml/sec. After 36 months IPSS score, QoL & Qmax were 12 (6-24), 2 (1-4) & 10.4 ml/sec. Only 1 patient (3.1%) required TURP. By comparison, the PUL study baseline patient's mean (SD) TPV, IPSS score, QoL, & Qmax were 44.5 (+12.47), 22.3 (13-35), 4.6 (4.4-4.8), 7.9 (3-13) ml/sec. After 36 months IPSS score, QoL, & Qmax were 12.7 (11-14), 2.2 (1.9-2.6), & 11.8 (10.6-13) ml/sec. The iTind resulted in superior Qmax (p=0.033) & similar IPSS (p=0.098) & QoL (p=0.192) improvements compared to PUL implant at 3 years. In Canada the iTind device cost is approx. $2500 CAD & 1 device is used per case. The approx. cost of a PUL implant is $800 CAD/implant & the mean number of PUL implants used in the L.I.F.T. study was 5.2. Thus, in Canada the approx. cost per PUL procedure will be $4160 CAD.

INTERPRETATION OF RESULTS
Small sample size in the may limit the interpretations of outcomes in this study. However, the iTIND sample population represents the largest reported cohort in the literature to date. Clinical data were based off multiple sources.

CONCLUDING MESSAGE
The iTind demonstrates equivalent or superior 3 year outcomes compared to the UroLift & is a lower cost option in Canada.

Funding This study was funded by the presenter. **Clinical Trial** No **Subjects** Human **Ethics not Req'd** The study exclusively involved anonymized secondary database de-identifiend of any patient identifiers. **Helsinki** Yes **Informed Consent** Yes

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DIAGNOSIS AND TREATMENT OF CATHETER-DEPENDENT MEN AFTER TRANSURETHRAL RESECTION OF THE PROSTATE AND LASER FAILURES

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HYPOTHESIS / AIMS OF STUDY
Urinary retention and incomplete bladder emptying after transurethral resection of the prostate (TURP) and laser failures are caused by persistent urethral obstruction and/or detrusor underactivity (DU). The aim of this study is to compare urodynamic findings and surgical outcomes of TURP and KTP laser prostate ablation (KTPLAP) in catheter-dependent men who were advised that they were no longer surgical candidates by their prior urologists, but subsequently underwent surgery at our institution.

STUDY DESIGN, MATERIALS AND METHODS
This is a retrospective observational study of catheter-dependent men due to urinary retention thought to be unsuitable for surgery after failing TURP or KTPLAP. A database was searched for catheter-dependent men who underwent urodynamics after failed TURP or KTPLAP. Exclusion criteria were neurogenic bladder and temporary catheterization. All patients underwent routine assessment including cystoscopy and videourodynamics (VUDS) and were divided into 3 groups based on the bladder outlet obstruction index (BOOI) and bladder contractility index (BCI): 1) DU, 2) bladder outlet obstruction (BOO), and 3) detrusor acontractility (DA). See table 2 for definitions. The primary outcome measures were the Patient Global Impression of Improvement (PGII) and catheter independence. Secondary outcomes were uroflow (Q) and postvoid residual urine (PVR). Mann-Whitney and Pearson chi-squared tests were utilized.

RESULTS
100 catheter-dependent men were identified and 30 excluded due to complicating comorbidities (i.e., cancer), urethral stricture identified as the primary cause of obstruction, or insufficient records (i.e., VUDS). 24 declined surgery and 46 elected surgery of whom 70% had pure DU, 30% had pure BOO, and 13% had both. Mean follow-up time was 74 months, and median, 43 months (range 3 mo - 25 yr). At follow up, 38/46 (83%) of patients had a successful outcome based on the PGII and 89% were rendered catheter-free (see table 2). There was no difference in any preoperative characteristics between men who underwent surgery and those who declined. Pre-op, the DU group had a larger bladder capacity (as expected), lower Qmax on UDS, and greater PVR. In both BOO and DU patients (with or without BOO), surgery produced similarly good results in flow although the DU group had a greater improvement in PVR. One of three DA patients were rendered catheter-free.

INTERPRETATION OF RESULTS
Conventional thinking is that that men with DU are unsuitable candidates for TURP and KTPLAP because the underactive bladder is unable to contract forcefully or long enough to achieve a good outcome [1]. Yet in this series, catheter-dependent men after failed TURP or KTPLAP, thought to be poor surgical candidates, had a high success rate after prostate surgery despite nearly 3/4 having DU. All BOO patients and 91% of DU patients were rendered catheter free and, from a subjective standpoint (PGII), 93% and 79% had a successful outcome. These data suggest that if the bladder can contract, albeit weakly, KTPLAP & TURP are effective in improving symptoms in the vast majority of patients. This is not the case, though, in patients with an acontractile detrusor; only one in three had a successful outcome. These data also suggest that conventional mathematical methods of defining bladder outlet obstruction are inaccurate in patients with detrusor underactivity [2].

CONCLUDING MESSAGE

The role of DU as a negative prognostic factor for prostate surgery should be reevaluated. TURP/KTPLAP rendered patients catheter free in all those with BOO and 89% of those with DU, whether or not they were obstructed according to the BOOI. The accuracy of defining BOO in men with DU should be reevaluated.

FIGURE 1

Table 1. Baseline characteristics of men who underwent TURP or KTPLAP after failing prior prostate surgery.

n	46
Age	73 ± 9
BOOI	50 ± 34
BCI	62 ± 37
DU	70%
DA	7%
BOO (i.e. not DU/DA)	30%
Bladder capacity (mL)	709 ± 627
Pre-op Qmax (free-flow)	4.3 ± 9.4
Pre-op Qmax (UDS)	1.8 ± 2.1
Pre-op postvoid residual (mL)	688 ± 594
Intermittent cath	50%
Indwelling cath	50%

FIGURE 2

Table 2. Patients treated with TURP or KTPLAP. *P* values compare BOO and DU columns. Volumes in mL; flows in mL/s, DU defined as BCI < 100, BOOI defined as BOO > 40, DA defined as absence of detrusor contraction.

Surgery patients	*BOO (no DU)*	*DU (±BOO)*	*p value*	*DA*
n	14	32		3
Age	73.1 ± 7.7	72.3 ± 18.6	*0.22*	64.7
BOOI	84 ± 22	39 ± 26	*0.000*	NA
BOOI < 30		45%		
BOOI 30 - 40		5%		
BOOI> 40	100%	50%		
BCI	99 ± 33	49 ± 25	*0.000*	3
Bladder capacity	443 ± 246	775 ± 663	*0.012*	1671
Post-op Q_{max}	20.5 ± 11.0	15.7 ± 9.1	*0.186*	8.7
Post-op PVR	67 ± 58	101 ± 127	*0.20*	360
Cath-dependent post-op	0%	11%	*0.097*	67%
PGII < 4	93%	79%	*0.37*	33%

REFERENCES

1. Thomas AW, Cannon A, Bartlett E, Ellis-Jones J, Abrams P. The natural history of lower urinary tract dysfunction in men: the influence of detrusor underactivity on the outcome after transurethral resection of the prostate with a minimum 10-year urodynamic follow-up. BJU international (2004). 93;6: 745-50.
2. Blaivas JG, et al. Surgical treatment of detrusor underactivity: A short term proof of concept study. International Braz J Urol (2017). 43;3: 540-548.

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THE EFFECT OF URINARY RETENTION ON THE SURGICAL OUTCOME OF HOLEP IN PATIENTS WITH LUTS/BPH: A PROSPECTIVE COHORT STUDY

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HYPOTHESIS / AIMS OF STUDY

We evaluate the effect of urinary retention (UR) on Holmium laser enucleation of the prostate (HoLEP) in patients with lower urinary tract symptoms (LUTS) and benign prostate hyperplasia (BPH)

STUDY DESIGN, MATERIALS AND METHODS

A prospective cohort of LUTS/BPH patients who underwent HoLEP between January 2010 and December 2016 as a part of BPH Database Registry were enrolled for this study. The criteria for inclusion were patients whose age were over 50 years. Patients with genitourinary cancer, previous pelvic surgical history, and neurogenic bladder were excluded. Baseline evaluation included careful history taking, digital rectal examination, IPSS, Overactive Bladder Symptom Score (OABSS), serum PSA level, uroflowmetry, PVR measurement, urodynamic study, and prostate volume measured by transrectal ultrasonography. Under spinal or general anesthesia, HoLEP was performed with patient placed in a lithotomy position. Enucleation was performed using the 3 or 4 lobe technique with a 80W (2J x 40Hz) setting of Homium YAG laser, followed by morcellation of adenomas. Continuous bladder irrigation was performed with normal saline. Typically, on postoperative day one, urethral Foley catheter was removed. Intraoperative parameters included operative time, enucleation weight, and intraoperative complications. Postoperative evaluation was performed at 2 weeks, 3 months and 6 months. Patients were categorized as non-UR, AUR and CUR groups and clinical parameters were compared. Acute urinary retention (AUR) was defined as a sudden spontaneous onset of being unable to pass urine and chronic urinary retention (CUR) was defined non-transient voiding difficulty with a PVR more than 300 mL. A mean values with standard deviation (SD) were used for analysis of continuous variables. Categorical variables were analyzed by the ratio of events (%).Paired t-tests and ANOVA tests were used to com-

pare the postoperative changes. Statistical significance was defined as a p-value ≤0.05.

RESULTS

A total of 903 patients (non-UR 732 patients; AUR 135 patients; CUR 36 patients) with a mean age of 68.8(± 6.4) years were identified. For temporary relief of AUR, CIC was adopted in 70.4% of the patients, urethral catheter indwelling in 22.2%, and urethral catheter indwelling followed by CIC in 7.4%. Mean duration of CIC was 2.2 (± 6.6) days and that of urethral catheter indwelling was 5.1 (± 16.6) days. For temporary relief of CUR, CIC was adopted in 33.3%, urethral catheter indwelling in 25.0%, and urethral catheter indwelling followed by CIC in 2.8%. The mean duration of CIC was 13.2 (± 38.0) days and that of urethral catheter indwelling was 3.5 (± 10.0) days (P<0.001). Mean baseline Qmax in non-UR, AUR and CUR group was 7.6 ml/s, 6.6 ml/s and 4.8ml/s, respectively (P<0.001); Mean total prostate volume was 66.1 (± 31.5), 89.9(± 44.8), 85.3 (± 38.1)ml (P< 0.001). Urodynamic detrusor underactivity was found in 28 (3.8%) of the non-UR patients, 11 (8.1%) of the AUR patients, and 2 (5.6%) of the CUR patients (P=0.082). Mean PdetQmax were 64.4, 74.3 and 77.7cmH2O (P<0.001); mean BOO index were 49.5, 61.1 and 69.4 (P<0.001); mean operation time were 54.0, 68.5, and 68.7 mins (P<0.001); mean enucleation weight were 20.7, 35.0 and 34.1 grams (p<0.001), respectively. There was no difference in intraoperative complication such as bladder injury, prostatic capsule perforation, or persistent bleeding. Necessity for additional continuous bladder irrigation was more frequent in AUR patients (p<0.001) than other groups during immediate postoperative period. There was no difference in mid-term postoperative complication such as delayed bleeding, stress urinary incontinence, urethral stricture, or bladder neck contracture up to 6 months followup. Postoperatively, IPSS, OABSS, and Qmax were improved in all three groups and there was no difference among the three groups. Mean PVR just before surgery in non-UR, AUR and CUR group was 55 ml, 75 ml and 333 ml, respectively, and its difference still remained significant among the three groups (15ml, 22 ml and 52 ml, respectively) at postoperative 6 months (P<0.001). None in both AUR and CUR group required CIC or urethral catheter at postoperative 6 months

INTERPRETATION OF RESULTS

Patients with UR had a larger prostate and more severe BOO compared to non-UR patients, which might have resulted in longer operation time and longer morcellation time in patients with UR. Nevertheless, our results showed that there was no significant difference in postoperative complications between Non-UR and UR groups. Our results also demonstrated that there was no significant difference in postoperative outcomes between Non-UR and UR groups, except for PVR volume in CUR patients. However, the mean volume of PVR at the postoperative 6 months in this particular group was 52.2 ml, which was clinically not meaningful. The scores of IPSS and OABSS showed significant improvement at postoperative 6 months.

CONCLUDING MESSAGE

Baseline history of AUR and CUR did not adversely affect the postoperative outcome of HoLEP, nor did these conditions increase postoperative complications.

FIGURE 1

Table 1 Postoperative complications in both Non-UR and UR groups

Variables	Non-UR N=732)	AUR (N=135)	CUR (N=36)	P-value
Postoperative 2 week				
-Urinary incontinence	127 (17.4%)	19 (14.1%)	5 (13.9%)	0.570
-Urgency	154 (21.1%)	19 (14.1%)	2 (5.6%)	0.016
-Transfusion	0 (0.0%)	2 (1.5%)	0 (0.0%)	0.003
-Re-catheterization	39 (5.3%)	11 (8.1%)	2 (5.6%)	0.438
-Continuous bladder irrigation	9 (1.2%)	3 (2.2%)	0 (0.0%)	0.506
-Bleeding requiring TUC	1 (0.1%)	1 (0.7%)	0 (0.0%)	0.374
Postoperative 3 months				
-Stress urinary incontinence	44 (6.0%)	5 (3.7%)	2 (5.6%)	0.566
-Urgency urinary incontinence	59 (8.1%)	7 (5.2%)	3 (8.3%)	0.507
-Urgency	139 (19.0%)	37 (27.4%)	4 (11.1%)	0.032
-Urethral stricture	4 (0.5%)	1 (0.7%)	0 (0.0%)	0.866
-Bladder neck contracture	1 (0.1%)	0 (0.0%)	0 (0.0%)	0.625
Postoperative 6 months				
-Stress urinary incontinence	13 (1.8%)	3 (2.2%)	0 (0.0%)	0.668
-Urgency urinary incontinence	11(1.5%)	2(1.4%)	0 (0.0%)	0.311
-Urgency	22 (3.0%)	4 (3.0%)	0 (0.0%)	0.573
-Urethral stricture	4(0.5%)	3 (2.2%)	1 (2.8%)	0.564
-Bladder neck contracture	1 (0.1%)	2 (1.5%)	0 (0.0%)	0.760

FIGURE 2

Table 2 Postoperative outcomes in both Non-UR and UR groups

Variables	Non-UR (N=732)	AUR (N=135)	CUR (N=36)	P-value
Qmax baseline	9.5 ± 4.8	8.4 ± 4.5	6.3 ± 3.2	< 0.001
Qmax 2 week	20.9 ± 10.0	19.6 ± 8.9	20.4 ± 12.2	0.276
Qmax 3 month	23.0 ± 12.7	22.6 ± 11.0	20.7 ± 12.0	0.376
Qmax 6 month	22.5 ± 12.7	20.9 ± 10.1	21.9 ± 14.5	0.385
PVR baseline	55.5 ± 58.9	75.1 ± 70.3	333.7 ± 224.2	< 0.001
PVR 2 week	20.9 ± 32.4	29.8 ± 38.1	66.5 ± 82.2	< 0.001
PVR 3 month	16.8 ± 32.2	23.5 ± 38.0	45.3 ± 74.4	< 0.001
PVR 6 month	15.9 ± 30.0	22.8 ± 46.0	52.2 ± 100.3	< 0.001
IPSS baseline	21.4 ± 10.6	21.0 ± 13.0	26.2 ± 14.3	0.128
IPSS 3 month	7.3 ± 7.2	7.1 ± 6.7	8.1 ± 6.5	0.845
IPSS 6 month	4.7 ± 5.5	4.3 ± 4.8	8.0 ± 8.4	0.055
OABSS baseline	4.7 ± 4.3	4.7 ± 5.3	6.3 ± 8.0	0.134
OABSS 3 month	2.7 ± 3.3	2.5 ± 2.8	2.1 ± 2.7	0.279
OABSS 6 month	1.7 ± 2.3	1.5 ± 2.2	1.5 ± 2.5	0.384

Funding No funding or grant **Clinical Trial** No **Subjects** Human **Ethics Committee** Seoul National University Hospital Clinical Research Institute **Helsinki** Yes **Informed Consent** Yes

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INCREASED OXIDATIVE STRESS IN THE DETRUSOR OF MEN WITH BLADDER OUTLET OBSTRUCTION

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HYPOTHESIS / AIMS OF STUDY

This study aimed to evaluate the link between preoperative parameters and oxidative stress (OS) markers in the bladder wall of men undergoing open prostate surgery. We hypothesized that severe bladder outlet obstruction (BOO) was associated with increased OS in the detrusor of men with lower urinary tract symptoms (LUTS).

STUDY DESIGN, MATERIALS AND METHODS

From July 2014 to August 2016, men aged ≥ 50 years and presenting with LUTS were prospectively enrolled. We collected clinical, and anthropometric data such as age, comorbidities, weight, height, body mass index (BMI), fasting glucose, and blood pressure. Preoperative assessment also included validated questionnaires (IPSS and OAB-V8), lower urinary tract ultrasound and urodynamics. Urodynamic studies were performed 2 to 3 weeks before open prostatectomy, using the Laborie Dorado KT® device (Laborie Medical, Ontario, Canada). All assessments were performed by a single trained researcher, in compliance with the International Continence Society (ICS) Good Urodynamic Practices. Bladder biopsies were taken during open prostatectomy for determination of OS markers. Our primary endpoint was the association between OS markers and severity of BOO. Exploratory endpoints included the link between OS markers various preoperative characteristics, such as obesity, severity of LUTS, overactive bladder symptoms, ultrasound and urodynamic parameters. Increased OS was defined by increased concentration of malondialdehyde (MDA) and/or decreased concentration of antioxidant enzymes (superoxide dismutase and/or catalase). OS and preoperative parameters were compared using the Student T test. P<0.05 was regarded as statistically significant.

RESULTS

Thirty-eight consecutive patients were included. Mean age was 66.36 ± 6.44 years. Mean body mass index (BMI) was 26.36 ± 2.98 kg/m2. The most common comorbidities were systemic arterial hypertension (50%) and diabetes mellitus type 2 (DM2) (29%). Regarding LUTS severity, 14 patients (36.8%) presented mild symptoms, 18 (47.3%) moderate and 6 (15.7%) severe symptoms. Prevalence of overactive bladder symptoms (OAB-V8 score ≥ 8 points) was 36.8% (n=14). Mean prostate volume estimated by transabdominal ultrasound was 77.7 ± 20.63 cm3. Mean bladder wall thickness (BWT) was 3.99 ± 1.39 mm.

Primary endpoint: BOO was observed in 29 patients (76.3%). MDA concentration was increased in men with severe BOO (zone V or VI on Schaefer's nomogram; figure 1) (p=0.022).

Exploratory endpoints: Patients with severe LUTS (IPSS score ≥ 20 points) had higher MDA concentration in the bladder wall when compared to the patients with mild LUTS (IPSS <8 points): 290.93 ± 237.87 vs. 111.93 ± 82.37 pmol/mg, respectively (p=0.031). Otherwise, the diagnosis of OAB (OAB-V8 score ≥8 points) had no association with increased OS in the bladder wall (p > 0.05). There was a statistically significant association between increased post-void residual urine (cut-off ≥ 50 ml) and OS in the bladder (higher levels of MDA and reduced activity of both antioxidant enzymes) (p<0.05).

Obesity was associated with reduced activity of the antioxidant enzyme catalase (170.88 ± 27.46 vs. 317.11 ± 268.98 pmol/mg in obese and in non-obese patients, respectively; p=0.01) and with reduced activity of the antioxidant enzyme SOD (0.4 ± 0.19 vs. 0.76 ± 0.59 Usod/mg in obese and in non-obese patients, respectively; p=0.05). MDA concentration was higher in patients with BWT ≥ 3 mm compared to those with BWT < 3 mm (342.03 ± 317.03 vs. 157.97 ± 107.47 pmol/mg, respectively; p=0.015).

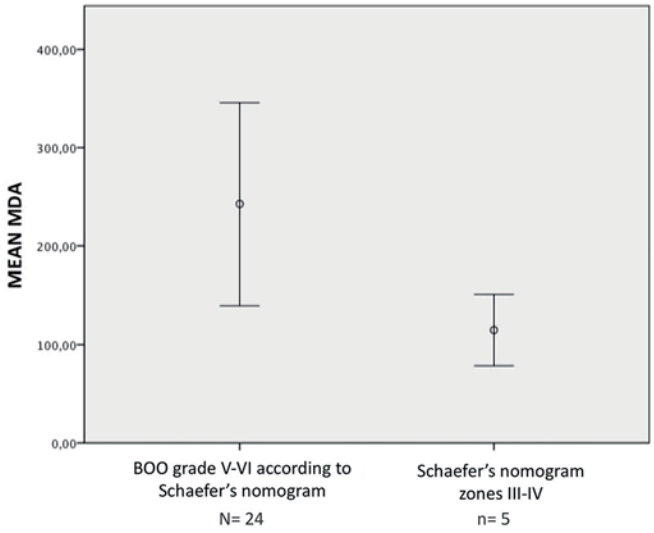
INTERPRETATION OF RESULTS

To our knowledge, this is the first study investigating OS markers (MDA, SOD and catalase) in the detrusor muscle of humans undergoing open prostate surgery. Clinical factors (LUTS severity and obesity, ultrasound findings (bladder wall thickness ≥ 3 mm), and urodynamic parameters (BOO severity, post-void residual urine ≥ 50 ml) were associated with increased OS in the detrusor. Identification of such factors may have clinical relevance, as evidence from animal models suggested a relationship between increased OS and bladder dysfunction (1-3).

CONCLUDING MESSAGE

This pilot study showed that increased OS in the detrusor of men with LUTS was associated with severe BOO and other preoperative parameters. Further studies are still needed to assess the role of non-invasive biomarkers of OS in predicting bladder dysfunction in men with LUTS.

FIGURE 1



REFERENCES

1. Azadzoi KM, Yalla SV, Siroky MB. Human bladder smooth muscle cell damage in disturbed oxygen tension. Urology. 2011;78(4):967.e9-15.
2. Callaghan CM, Schuler C, Leggett RE, Levin RM. Effect of severity and duration of bladder outlet obstruction on catalase and superoxide dismutase activity. Int J Urol. 2013;20(11):1130-5.
3. Malone L, Schuler C, Leggett RE, Levin RM. The effect of in vitro oxidative stress on the female rabbit bladder contractile response and antioxidant levels. ISRN Urol. 2013;2013:639685.

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A NOVEL, NON-OPIOD BASED TREATMENT APPROACH TO MEN WITH UROLOGIC CHRONIC PELVIC PAIN SYNDROME (UCPPS) USING ULTRASOUND GUIDED NERVE HYDRODISSECTION AND PELVIC FLOOR MUSCULATURE TRIGGER POINT INJECTIONS

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HYPOTHESIS / AIMS OF STUDY

Urological Chronic Pelvic Pain Syndrome (UCPPS) represents a group of pain symptoms relating to patients with pelvic pain that are poorly understood and for which treatment is largely unsatisfactory. Newer nomenclature has combined Chronic Prostatitis/Chronic Pelvic Pain Syndrome (CP/CPPS) and Interstitial Cystitis/Painful Bladder Syndrome (IC/PBS) into a single classification of UCPPS. The objective of this study is to analyze the effects of a novel treatment strategy in males suffering from UCPPS.

STUDY DESIGN, MATERIALS AND METHODS

This retrospective, institutional review board approved study analyzed eight male patients aged 24-61 with UCPPS. All patients had a trial of antibiotic therapy, and had pelvic floor physical therapy pre and post taking part in the study. Patient's scores on the Visual Analogue Scale (VAS) and Functional Pelvic Pain Scale (FPPS) were collected pre-treatment (Figure 1). While continuing physical therapy, patients underwent ultrasound guided pelvic floor trigger point injections to the iliococcygeus, pubococcygeus, and puborectalis. The first two injections combined 1% lidocaine with dexamethasone, while the next 4 injections consisted of 1%lidocaine with traumeel (a homeopathic, plant derived anti-inflammatory medication). Concomitantly, patients received peripheral nerve hydrodissection performed on the pudendal nerve and the posterior femoral cutaneous nerve. These treatments allow the nerves to reset, decreasing hypersensitivity. These treatments lasted for 6 weeks. After completion of treatment, each patient retook the VAS and FPPS.

RESULTS

The mean age of our patients was 31.8 years and the average duration of symptoms of the UCPPS was 21 months. Pre–treatment, the mean VAS was 3.3 (STD 1.7) and the mean VAS post-treatment was 1.8 (STD 1.4); $P<0.05$, 95% CI 0.73-2.27. The mean FPPS pre-treatment was 11.0 (STD 8.0) and the mean FPPS post treatment was 6.3 (STD 5.3); $P<0.05$, 95% CI 0.03-9.22.

INTERPRETATION OF RESULTS

Our results show promise for a novel, non-opiod based treatment for UCPPS by using ultrasound guided pelvic floor trigger point injections combined with peripheral nerve hydrodissection with lidocaine, traumeel, and dexamethasone along with a pelvic floor physical therapy program.

CONCLUDING MESSAGE

This novel approach at treating UCPPS using by using ultrasound guided pelvic floor trigger point injections combined with peripheral nerve hydrodissection is a promising treatment option for males suffering from this chronic painful medical condition.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Northwell Health **Helsinki** Yes **Informed Consent** Yes

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WHY NOT TONIGHT?

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HYPOTHESIS / AIMS OF STUDY

Up to 60% of women attending Urogynaecology clinics report sexual dysfunction (SD), however, only a minority are consistently screened for sexual complaints . An assessment of the practice of members of the British Society of Urogynaecology and found that only 50% of clinicians regularly asked about SD .

The primary aim of this investigation was to screen sexual function (SF) in all women attending our one stop Urodynamics (UDS) clinic. The secondary aims were to evaluate why women were not sexually active (NSA), to assess if this was bothersome to them, to evaluate variations in SA according to UDS diagnosis and to compare questionnaire responses between the SA and NSA groups.

STUDY DESIGN, MATERIALS AND METHODS

All women attending a UDS clinic were sent the Prolapse and Incontinence Sexual Questionnaire – IUGA Revised (PISQ-IR) as part of the pre-visit information pack. These were collected and reviewed when the women attended for assessment. Initial analysis was performed using descriptive statistics and recorded in association with demographic data and UDS diagnosis. Following this, a multivariate binary logistic regression was used to analyse the risk of being sexually active (SA) as a function of potentially contributing factors identified in the PISQ-IR. All factors were entered as covariates in the initial model via a forced entry method. The resulting model's goodness-of-fit was determined using the Hosmer-Lemeshow statistic.

The analyses were performed three times to investigate 1. All women attending the UDS clinic, 2. Only women diagnosed with detrusor overactivity (DO) and 3. Only women complaining of overactive bladder (OAB) symptoms with normal UDS parameters.

RESULTS

Four hundred questionnaires were completed over 9 months. 193 presented with urinary incontinence (UI), 34 with Pelvic organ prolapse (POP), 117 with UI and POP and 56 with other Lower Urinary Tract Symptoms (LUTS) including voiding difficulties and recurrent urinary tract infections.

Group 1 - Of the women assessed, two hundred and thirty two (58%) were SA and one hundred and sixty eight (42%) were NSA. Eighty nine women (53%) were NSA because of lack of a partner. Of the 79 women who were NSA but had a partner, 60% reported that this was secondary to their bladder symptoms, 45% due to other health problems, 53% reported having no interest and 58% were bothered 'A lot' by their sexual status. 363 went on to have full subtracted cystometry.

Group 2 - Ninety five women were found to have DO on UDS. Of these, 60% were SA. One hundred percent of the women who were NSA reported UI and 93% of the SA women reported UI. For 47% (n=18) of these it was because of lack of a partner. Only 9 women reported having a partner and the other women did not answer.

Group 3 - Sixty seven women reported symptoms of OAB but had normal UDS findings. Of these only 45% were SA. Of the SA women 87% complained of OAB wet compared 70% of the women who were NSA. 65% (n=22) were NSA because of lack of a partner. Only 6 women reported having a partner and the other women did not answer.

In the NSA group, the relationship between bothersomeness and age was analysed using an independent T-test. This showed that those who were not bothered were, on average, 10.46 [95% CI: 4.861, 16.068] years older than those who were bothered ($t(126) = 3.696$, $p < 0.000$). ?

Those who had no interest in sex were almost 5 times more likely to be bothered by their sexual inactivity, while those who were NSA due to their UI / POP problems were almost nine times more likely to be bothered.

Those with POP were 2.5 times more likely to avoid sex through fear of bulge /leaking than those without ($\chi2(1) = 8.339$, $p = 0.004$).

In women with OAB, having at least one live birth made a significant contribution, resulting in a 42-fold increase in the chances of UI during sex. However, the mode of delivery was not assessed in this group.

Overall, these analyses found that more women with OAB are NSA compared to the other UDS findings, yet women with POP are more likely to avoid sex. Younger age, lack of interest and being NSA due to bladder and bowel problems are predictors of increased bothersomeness of sexual inactivity. Parous women with OAB are 42 times more likely to experience Coital Incontinence than nulliparous women with OAB.

INTERPRETATION OF RESULTS

There were no factors identified in this study to help understand who may and may not be SA. This is not unexpected as sexual activity is dependent on more than just age, parity and UDS diagnosis but is also under the influence of a wide range of external and internal factors such as religion, personal beliefs, family / cultural influences, education, availability of a sexual partner, views of peers and these were not considered in this study.

This study suggests that the PISQ-IR may have a role in routine clinical practice. It may help us to gain a deeper understanding of patients SF, which may help clinicians to understand which patients are most troubled by sexual problems in order to tailor assessment and therapy to meet their needs. However, without the clinician actively reviewing it with the patient it could become just another paper exercise. It may therefore be better used in women who report a sexual problem when questioned instead of as a screening tool for all women in clinics.

It is important to remember that when discussing the prevalence of SA in this setting that it is a biased group of women as they have all sought help for a UI or POP problem. There are many women in the community who have not sought help for a variety of different reasons and then impact of UI / POP on their sexual function remains unknown.

CONCLUDING MESSAGE

Overall this study provided us with a lot of useful information about our clinical population. Although a high proportion of them were NSA, we were unable to find any specific factors that were more likely to lead to sexual inactivity. It did however, enhance the knowledge regarding the level of distress or bothersomeness experienced by people who are NSA due to their UI / POP and the need for further research into this area to understand that mechanism behind the problems and how it can be resolved.

REFERENCES

1. Pauls et al 2006
2. Roos et al 2009

Funding Part of a research project funded by an investigator initiated research grant from Pfizer **Clinical Trial** Yes **Registration Number** EudraCT Number 2010-023851-27 **RCT** No **Subjects** Human **Ethics Committee** NRES East oF England **Helsinki** Yes **Informed Consent** Yes

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EXPLORING GRADUATE PHYSIOTHERAPY STUDENTS' EXPERIENCES OF INTIMATE PEER PHYSICAL EXAMINATIONS

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HYPOTHESIS / AIMS OF STUDY

Historically, pelvic floor/women's health physiotherapists have been taught to perform intimate pelvic examinations using peers. Other health professionals, such as medicine and nursing, utilise mannequins or teaching associates to learn gynaecological examinations. A key component of a physiotherapy intimate pelvic examination (IPE) is the assessment of pelvic floor muscle function. Mannequins are not utilised to teach physiotherapists as mannequins are unable to simulate pelvic floor muscle contraction. Teaching associates have not been used in physiotherapy predominantly due to the cost and the lack of trained personnel.

The aim of this study was to explore graduate physiotherapists' experiences of learning to perform IPE using peers within a postgraduate university course. The objective of this project was to provide qualitative information about the experience and acceptability of physiotherapy postgraduate students to learning intimate pelvic examinations through peer examination. This information will be used to inform the teaching methods of peer examination for future students in pelvic floor physiotherapy. The study addressed the following key questions:

What is the graduate student's experience and acceptability of:

a) learning intimate pelvic examinations on their peers, and

b) being the patient for their peers to learn intimate pelvic examinations?

STUDY DESIGN, MATERIALS AND METHODS

This is a descriptive study exploring the experience and acceptability of graduate physiotherapy students to learning intimate pelvic examinations through peer examination. Inclusion criteria for participation were postgraduate students at two universities within the 2017 and 2018 cohorts, who were adults over 18 years of age. They were invited to participate in an on-line anonymous survey (Survey Monkey). The anticipated number of participants was 50 students. Participants were invited to complete two on-line questionnaires; Questionnaire A prior to learning intimate pelvic examinations and Questionnaire B approximately 10 days after learning this intimate examination. The survey data was analysed using descriptive statistics. A general inductive approach was taken to analyse the free text responses. Two of the responsible researchers repeatedly studied the transcripts and discussed possible meanings and emerging themes which were developed and categorised.

RESULTS

Fifty adult female postgraduate physiotherapists were recruited and all gave written informed consent. The mean (SD) years from graduation was 8.6 (5.7) years. Sixty-two percent had had previous training in IPE, 87% of these physiotherapists through short courses of continuing education, in which 93.6% had learned this examination on peers. Of those with previous training, 21% reported their technical ability to perform an IPE, and 25% their ability to interpret the findings from an IPE, as good to very good before learning within the postgraduate university courses. After IPE training within the postgraduate courses, this had increased to 87% and 78% respectively. As detailed in Tables 1 and 2, there were positive changes for both technical skills learning and emotional responses after the IPE training.

Two main themes emerged from 48 free text transcripts prior to the training regarding their experience and the acceptability of learning on peers, when being the examiner. In the major theme (26/48 responses), 'educational value', students expressed positive feelings toward their potential for personal learning, helping their peers to learn, and gaining an understanding of the patient's experience of pelvic examinations. The second theme (22/48 responses) was 'emotional response'. Students expressed strong emotions such as anxiety and nervousness, and the milder emotions of apprehension and daunting, in anticipation of the training. The same two themes emerged from the 39 responses anticipating being the patient for IPE training. Again the major theme of 'educational value' emerged (22/39 responses), with positive responses expressed regarding the opportunity for skills training, feedback on performance and gaining an understanding of the patient's experience. In the 'emotional response' theme (17/39 responses), there were two relatively equal categories of anxiety and nervousness, and fear about their body image of intimate body parts.

In response to 'provide suggestions for change' about this form of learning (21/35 responses), 13/21 participants responded that no change was required. No themes emerged from the eight other responses. Three participants commented on the expertise and understanding of tutors in modelling the IPE, which allayed their anxiety; two participants wanted to use teaching associates, and one participant found the learning took an emotional toll on her.

INTERPRETATION OF RESULTS

The results of this study provide a valuable insight into the experiences and acceptability of learning to undertake intimate peer examinations. All student participants in the two university cohorts were given written information regarding the process and experience of learning IPE on their peers, prior to, and on entering the postgraduate courses. Despite this, there was a high level of anxiety within the cohorts prior to their IPE learning. The emotional responses were balanced with the cognitive understanding of the educational benefits of undertaking peer examinations, and for some students, a combination of the two themes. Educators ameliorated the emotional responses by their sensitive approach

to this learning and by feedback. This resulted in a positive shift in survey responses to both improved skills and reduced emotional response.

CONCLUDING MESSAGE

The results of this study provide a better understanding of the student perspective of the teaching and learning of intimate examinations and can be used to inform the educational approach in physiotherapy programs that teach IPE. Educators must balance both emotional and educational needs of their students and be aware that peer learning may not be acceptable to some students.

FIGURE 1

Table 1. Experience of internal pelvic examinations as the examiner **before** IPE training (n=48)

	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
I am confident about performing internal pelvic examinations	8 (16.7)	17 (35.4)	6 (12.5)	14 (29.2)	3 (6.3)
Performing internal pelvic examinations could be difficult for me because of my cultural background	34 (70.8)	14 (29.2)	0 (0.0)	0 (0.0)	0 (0.0)
Performing internal pelvic examinations could be difficult for me because of my religious beliefs	34 (70.8)	11 (22.9)	2 (4.2)	1 (2.1)	0 (0.0)
I feel embarrassed about performing internal pelvic examinations	14 (29.2)	10 (20.8)	10 (20.8)	13 (27.1)	1 (2.1)
I feel anxious about performing internal pelvic examinations	13 (27.1)	7 (14.6)	6 (12.5)	17 (35.4)	5 (10.4)
I worry that I may cause discomfort during an internal pelvic examination	3 (6.3)	16 (33.3)	16 (33.3)	13 (27.1)	0 (0.0)
I feel confident in my pelvic examination skills	8 (16.7)	20 (41.7)	7 (14.6)	11 (22.9)	2 (4.2)

FIGURE 2

Table 2. Experience of internal pelvic examinations as the examiner **after** IPE training (n=35)

	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
I am confident about performing internal pelvic examinations	0 (0.0)	1 (2.9)	1 (2.9)	22 (62.9)	11 (31.4)
Performing internal pelvic examinations is difficult for me because of my cultural background	27 (77.1)	8 (22.8)	0 (0.0)	0 (0.0)	0 (0.0)
Performing internal pelvic examinations is difficult for me because of my religious beliefs	27 (77.1)	7 (18.9)	0 (0.0)	0 (0.0)	0 (0.0)
I feel embarrassed about performing internal pelvic examinations	15 (42.9)	16 (45.7)	3 (8.6)	1 (2.9)	0 (0.0)
I feel anxious about performing internal pelvic examinations	10 (28.6)	14 (40.0)	7 (20.0)	4 (11.4)	0 (0.0)
I worry that I may cause discomfort during an internal pelvic examination	3 (8.6)	20 (57.1)	6 (17.1)	3 (8.6)	0 (0.0)
I feel confident in my pelvic examination skills	0 (0.0)	2 (5.7)	2 (5.7)	24 (68.6)	7 (18.9)
I am confident in my ability to interpret the findings of an internal pelvic examination	0 (0.0)	2 (5.7)	5 (14.3)	21 (60.0)	7 (18.9)

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** The University of Melbourne, Human Ethics Advisory Group **Helsinki** Yes **Informed Consent** Yes

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A NOVEL INTRAOBTURATOR ANCHORING TECHNIQUE FOR MALE INCONTINENCE SURGERY

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HYPOTHESIS / AIMS OF STUDY

Until the introduction of the AdVance™ sling (AMS Men's Health/Boston Scientific, MA, USA) in 2006 the obturator region did not play a major role in male incontinence surgery. Therefore little is known about the characteristics and stability of the obturator membrane in men.

As a further development of suburethral slings in women the single incision sling (SIS) technique with inside-out transobturator anchors have become increasingly popular. The known data of pull-out forces of existing female anchoring systems come from animal models. No such informations are available for men. We only know from abdominal hernia repair that the tensile strength of mesh material should exceed 32 N/cm to withstand the intraabdominal pressure in this area [1].

With the experience of male sling surgery and transobturator anchoring techniques in female continence surgery we developed a novel male anchoring system. The aim is to facilitate the insertion process of the male sling and to reduce the risks of the procedure by avoiding large needles or trocars. As a first step the novel anchoring technique is presented.

STUDY DESIGN, MATERIALS AND METHODS

As a fundamental part of the developing process of a new sling system we extensively studied and measured the obturator region in male cadavers. The neuro-vascular anatomy was meticulously dissected and the thickness of the obturator membrane was measured at different points with a micrometer caliper. With particular respect to safety and stability of the new sling system the optimal area for anchor insertion was determined. We then performed pull-out tests with the PelFix anchor (FEG, Aachen, Germany) that we previously described in an in-vitro and an animal model [2]. This very small anchor has demonstrated superior stability in comparison to three different approved devices in particular in the porcine rectus fascia. For the utilization in men also a new applicator was developed (Fig. 1). The test anchors were made of aluminium, the pull-out forces were measured on a Newton scale.

RESULTS

In four male cadavers all aspects of the obturator region were extensively dissected, colored, measured, and photo documented. The thickness of the obturator membrane was measured with a micrometer caliper (110 - 360 µm). Despite considerable inter-individual variations there was a consistent increase in membrane thickness from the cranial-lateral aspect (110 - 250 µm) to the caudal-medial area (210 - 360 µm). The obturator nerve and vessel branches are usually

located lateral of this caudal-medial 'safety zone'. Accordingly, the test anchors were placed in this area with the newly designed applicator. The pull-out forces in nine fresh male cadavers were consistently measured between 30 and 50 Newton (mean 41.1 N, Fig. 2). These values are far beyond the physiological forces that can be expected in the male pelvic floor, although no data from in vivo tests exist.

INTERPRETATION OF RESULTS

For the first time a new technique of male sling insertion and fixation is presented. Instead of transobturator trocar usage sling fixation is secured by an intraobturator anchor on either side. Like in previous studies in porcine rectus fascia the PelFix anchor demonstrates excellent stability through its transverse position after perforating the obturator membrane. In our study we were able to identify the optimal area of anchor insertion that is in the caudal-medial aspect of the obturator foramen. Here we find the thickest tissue to secure stability and the least chance to compromise obturator vessel or nerve branches. The degree of immediate anchor stability as measured in Newton by pull-out tests is very high, the pull-out forces are well beyond the expected maximum intraabdominal pressure.

CONCLUDING MESSAGE

The caudal-medial aspect is the safest and thickest part of the obturator membrane and therefore most suitable for a novel anchor fixation system in men. The PelFix anchor demonstrated easy application and excellent stability. It is suitable for single incision, outside-in, safe and simple fixation of a novel adjustable male sling system.

FIGURE 1

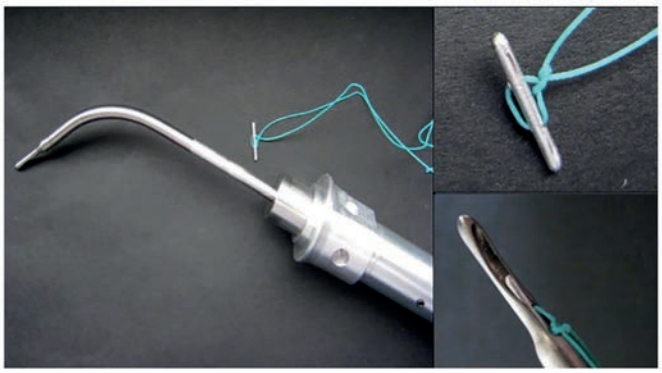
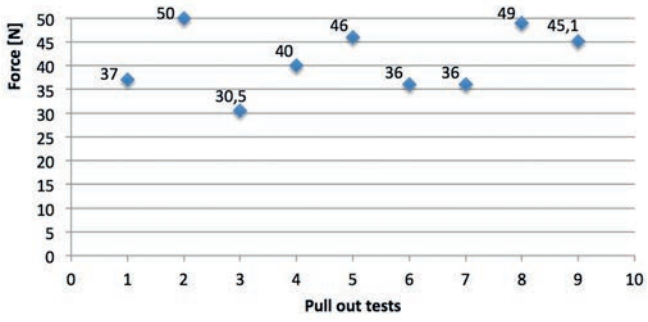


FIGURE 2



REFERENCES

1. Schumpelick V, Klinge U, Rosch R, Junge K. Light weight meshes in incisional hernia repair. J Minim Access Surg. 2006;2(3):117-123
2. Anding R, Tabaza R, Staat M, Trenz E, Lohmann P, Klinge U, Kirschner-Hermanns R. Introducing a Method of In Vitro Testing of Different Anchoring Systems Used for Female Incontinence and Prolapse Surgery. BioMed. Res. Int. 2013;401417,7 pages

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BEST IN CATEGORY PRIZE "ANATOMY / BIOMECHANICS"

QUANTIFICATION OF CEREBRAL BLOOD FLOW DURING BLADDER FILLING IN HEALTHY SUBJECTS

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HYPOTHESIS / AIMS OF STUDY

Urine storage is a complex physiologic process that is under central nervous system control. While the micturition pathway has been studied through various functional brain imaging studies, thereby providing insight on important brain regions and their role in voiding, how brain activity changes as bladder volume and bladder sensations change remains unclear. In this study, we aimed to quantify cerebral perfusion and the change in brain activity in healthy subjects during bladder filling.

STUDY DESIGN, MATERIALS AND METHODS

Healthy women without overactive bladder were recruited to undergo blood oxygen level dependent (BOLD) and arterial Spin Labeling functional neuroimaging (ASL fMRI), which is a newer functional neuroimaging technique that allows measurement of cerebral perfusion/oxygen consumption. Bladder filling was performed by infusing saline into the bladder at a rate of 50ml/minute via foley catheter. Subjects were provided with a response button to signal to the investigators their experiences of first sensation of bladder filling, first desire to void, and strong desire to void as they occurred during bladder filling. Scans were performed at bladder volumes of 0ml, 50ml, 100ml, 200ml, 350ml, and 500ml.

RESULTS

Eight healthy female participants were recruited. On average, participants experienced first and strong desire to void after 112 and 284mL bladder filling, respectively. Tables 1 and 2 show normalized CBF and absolute transverse relaxation rates respectively, during baseline, first desire to void and strong desire to void states for the selected regions of interest. The insula and right anterior cingulate cortex (ACC) exhibited significantly increased perfusion at first desire to void when compared to baseline while the supplemental motor cortex (SMC) exhibited decreased perfusion for the same comparison. Significantly decreased perfusion was observed in the insula, left hippocampus, and right posterior cingulate cortex (PCC) at strong desire to void when compared to first desire to void. The SMC and right dorsolateral pre-frontal cortex (DLPFC) exhibited significantly decreased transverse relaxation rates at first desire to void when compared to baseline while the right thalamus exhibited significantly increased rates for the same comparison. There were no significant differences in transverse relaxation rates at a strong desire to void when compared to first desire to void.

INTERPRETATION OF RESULTS

Functional neuroimaging has proved to be a particularly useful tool for studying how the central nervous system processes the desire to void and micturition. Recently, a meta-analysis of neuroimaging studies was conducted to determine the most likely brain regions involved in urine storage. This study identified 14 neuroimaging studies and 89 foci of brain activity that were previously reported to be involved during urine storage. When the neuroimaging data was synthesized, the following regions were identified and considered to be the most likely sites involved during bladder filling: thalamus, insula, pons, brainstem and cerebellum[1]. During urine storage, afferent signaling from the bladder provides information on the fullness of the bladder. These signals are relayed to the periaqueductal gray (PAG) which communicates with numerous higher order brain structures including the insula, the anterior cingulate cortex, the pons, the thalamus, and the prefrontal cortex to coordinate bladder filling, provide conscious sensation of filling, and suppress voiding until appropriate[2].

To our knowledge, this is the first study using fMRI that evaluates brain activity at discrete levels of bladder filling in normal subjects. Previous fMRI studies have observed similar increased brain activation during bladder filling in similar regions. These results support the hypothesis that suppression of a strong desire to void results in deactivation of the regions previously activated by the first desire to void[3]. This study lays the foundation for investigating the potential difference in responses in patients with overactive bladder (OAB), which could provide insight into the neurological mechanisms involved in OAB.

Our study has many limitations including the potential for differences in brain activity in men and women as this study only includes female patients. However, other work has suggested that there are no significant differences in brain activation between genders. Additionally, non-physiologic bladder filling via catheter may not accurately represent brain activation seen in normal bladder filling. Finally, this study evaluates the changes seen at specifically chosen regions of interest, and may overlook other important areas involved in bladder filling.

CONCLUDING MESSAGE

This study demonstrated differences in cerebral blood flow and BOLD signal of the limbic system at first desire to void and strong desire to void during bladder filling and lays the foundation for investigating the difference responses in patients with overactive bladder (OAB), which could provide insight into the neurological mechanisms involved in OAB.

FIGURE 1

Region of Interest	Normalized Cerebral Blood Flow				
	Baseline	First desire to void	Strong desire to void	Δ(First desire - baseline)	Δ(Strong desire - first desire)
Rt. ACC	0.89 ± 0.06	0.92 ± 0.08	0.90 ± 0.09	0.03 ± 0.04 *	-0.02 ± 0.07
Lt. ACC	0.96 ± 0.08	0.98 ± 0.09	0.89 ± 0.11	0.03 ± 0.06	-0.07 ± 0.10
Rt. DLPFC	1.71 ± 0.21	1.63 ± 0.18	1.59 ± 0.19	-0.07 ± 0.11	-0.05 ± 0.07
Lt. DLPFC	1.30 ± 0.28	1.26 ± 0.26	1.33 ± 0.19	-0.04 ± 0.10	0.02 ± 0.16
Rt. Hippocampus	0.99 ± 0.08	1.02 ± 0.08	0.98 ± 0.16	0.03 ± 0.07	-0.04 ± 0.10
Lt. Hippocampus	0.91 ± 0.07	0.91 ± 0.07	0.87 ± 0.11	0.00 ± 0.06	-0.05 ± 0.05 *
Rt. Insula	1.06 ± 0.09	1.10 ± 0.11	0.99 ± 0.13	0.04 ± 0.05 *	-0.10 ± 0.09 *
Lt. Insula	0.90 ± 0.05	0.95 ± 0.06	0.88 ± 0.08	0.04 ± 0.03 **	-0.07 ± 0.06 **
Rt. PCC	0.83 ± 0.07	0.83 ± 0.07	0.79 ± 0.09	0.01 ± 0.04	-0.04 ±0.04 *
Lt. PCC	0.92 ± 0.07	0.92 ± 0.08	0.89 ± 0.09	0.00 ± 0.03	-0.03 ± 0.04
Rt. Pons/midbrain	1.08 ± 0.11	1.10 ± 0.11	1.08 ± 0.13	0.03 ± 0.05	-0.04 ± 0.07
Lt. Pons/midbrain	1.08 ± 0.12	1.10 ± 0.12	1.07 ± 0.12	0.02 ± 0.06	-0.03 ± 0.09
Rt. SMC	1.04 ± 0.12	0.99 ± 0.08	1.04 ± 0.15	-0.04 ± 0.06 *	0.03 ± 0.11
Lt. SMC	0.95 ± 0.14	0.89 ± 0.11	0.96 ± 0.18	-0.05 ± 0.06 *	0.06 ± 0.13
Rt. SMA	1.21 ± 0.09	1.19 ± 0.07	1.22 ± 0.10	-0.02 ± 0.06	0.01 ± 0.09
Lt. SMA	1.04 ± 0.12	1.02 ± 0.14	1.07 ± 0.16	-0.02 ± 0.07	0.03 ± 0.10
Rt. Thalamus	0.81 ± 0.06	0.83 ± 0.06	0.80 ± 0.08	0.02 ± 0.05	-0.02 ± 0.05
Lt. Thalamus	0.87 ± 0.06	0.89 ± 0.08	0.86 ± 0.08	0.03 ± 0.05	-0.03 ± 0.04

Table 1. Cerebral blood flow values normalized to the global average at baseline (0mL), first desire to void, and strong desire to void states in 18 regions of interest from 8 healthy participants. Two tailed paired t-tests were used to compare differences between states; * denotes $p < 0.05$, and ** denotes $p < 0.01$

FIGURE 2

Region of Interest	Transverse Relaxation Rates (R_2^*)				
	Baseline	First desire to void	Strong desire to void	Δ(First desire - baseline)	Δ(Strong desire - first desire)
Rt. ACC	25.4 ± 1.9	25.6 ± 1.4	25.4 ± 2.3	0.24 ± 0.97	-0.14 ± 1.00
Lt. ACC	25.2 ± 1.9	25.6 ± 1.6	25.3 ± 2.3	0.38 ± 0.96	-0.34 ± 1.35
Rt. DLPFC	30.3 ± 4.5	29.7 ± 4.8	29.2 ± 4.4	-0.68 ± 2.40 **	-0.21 ± 3.36
Lt. DLPFC	21.8 ± 4.9	21.0 ± 4.6	23.9 ± 5.9	-0.83 ± 1.11	2.12 ± 4.32
Rt. Hippocampus	24.8 ± 6.5	24.3 ± 5.9	24.8 ± 6.8	-0.53 ± 1.44	0.67 ± 2.44
Lt. Hippocampus	23.7 ± 4.5	23.6 ± 4.6	23.5 ± 5.2	-0.03 ± 1.03	-0.01 ± 1.25
Rt. Insula	15.9 ± 1.2	15.8 ± 1.0	16.1 ± 1.3	-0.19 ± 0.40	0.41 ± 0.51
Lt. Insula	17.3 ±1.1	17.2 ± 1.3	17.0 ± 1.2	-0.07 ± 0.42	-0.01 ± 0.35
Rt. PCC	18.0 ± 0.8	18.0 ± 0.8	18.0 ± 0.6	0.00 ± 0.25	0.12 ± 0.19
Lt. PCC	17.7 ± 0.7	17.8 ± 0.6	17.8 ± 0.7	0.07 ± 0.29	0.12 ± 0.28
Rt. Pons/midbrain	27.5 ± 4.3	27.3 ± 4.6	28.8 ± 4.8	-0.15 ± 0.58	1.04 ± 1.38
Lt. Pons/midbrain	27.2 ± 3.9	27.1 ± 4.2	28.4 ± 4.5	-0.10 ± 0.60	0.78 ± 1.21
Rt. SMC	20.6 ± 2.7	19.8 ± 2.3	20.3 ± 3.0	-0.81 ± 0.85 *	0.12 ±1.76
Lt. SMC	20.2 ± 2.9	19.4 ± 2.1	20.1 ± 2.8	-0.80 ± 1.05 *	0.44 ± 1.81
Rt. SMA	24.0 ± 3.7	23.1 ± 3.4	23.8 ± 3.8	-0.91 ± 1.83	0.01 ± 2.14
Lt. SMA	20.8 ± 3.8	20.0 ± 2.8	21.4 ± 4.1	-0.83 ± 1.63	0.97 ± 2.34
Rt. Thalamus	19.7 ± 1.7	20.0 ± 1.6	19.8 ± 1.7	0.23 ± 0.27 *	0.15 ± 0.57
Lt. Thalamus	20.3 ± 2.4	20.0 ± 2.0	19.9 ± 1.8	-0.09 ± 0.63	0.06 ± 0.57

Table 2. Transverse relaxation rates at baseline (0mL), first desire to void, and strong desire to void in 18 regions of interest from 8 healthy participants. Two-tailed paired t-tests were used to compare differences between states; * denotes $p < 0.05$, and ** denotes $p < 0.01$

REFERENCES

1. Arya NG, Weissbart SJ, Xu S, Rao H. Brain activation in response to bladder filling in healthy adults: An activation likelihood estimation meta-analysis of neuroimaging studies. Neurourol Urodyn. 2017;36(4):960-965.

2. Kavia RBC, Dasgupta R and Fowler CJ. Functional imaging and the central control of the bladder. J Comp Neurol. 2005; 493: 27–32.
3. Lerner A, Bagic A, Hanakawa T, et al. Involvement of Insula and Cingulate Cortices in Control and Suppression of Natural Urges. Cereb Cortex. 2009;19(1):218-223

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ALTERATION OF SPHINGOSINE-1-PHOSPHATE SIGNALING PATHWAY IN THE VAGINAL WALL OF WOMEN WITH PELVIC ORGAN PROLAPSE

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HYPOTHESIS / AIMS OF STUDY

Pelvic Organ Prolapse (POP) is a disorder that occurs when the musculature of the pelvic floor weakens, resulting in pathologic descent of pelvic organs into the vaginal canal. While risk factors for POP have been suggested such as genetic predisposition, childbirth, obesity, and advancing age, the etiology of this condition remains largely unknown. Females have an 11% lifetime risk of POP which can result in urinary, bowel, and sexual dysfunction that can significantly impair a woman's quality of life.[1] Sphingosine-1-phosphate (S1P) is a bioactive lysosphingolipid with countless metabolic functions including regulation of cell proliferation and smooth muscle contractility.[2] S1P is generated by the phosphorylation of sphingosine by sphingosine kinase, which exists as two major isoforms (SPHK1 & SPHK2). This phosphorylation step is reversible via an enzyme known as sphingosine-1-phosphate phosphatase that also exists as two major isoforms (SPP1 & SPP2). Therefore, alterations in the relative expression of these 4 enzymes would be expected to play a major role in cell regulation. We hypothesized that the terminal step of the S1P pathway, namely the reversible conversion of sphingosine-to-S1P, is present in the female vaginal wall and further that the relative expressions of SPHK and SPP isoforms may be altered in vaginal tissue, thereby leading to decreased vaginal wall stability and subsequent POP.

STUDY DESIGN, MATERIALS AND METHODS

Full-thickness anterior vaginal wall tissue samples were obtained from women undergoing surgery under an approved IRB protocol with written informed consent for tissue acquisition and use of tissue. "CONTROL" samples (n=5) were obtained from women undergoing routine hysterectomy with no history of POP. "POP" samples (n=5) were obtained from women with POP undergoing reconstructive surgical repair. After removal, the sample were immediately brought back to the lab, where samples were cleaned of loose tissue and adventitia and were then separated into 2 layers under a dissecting microscope. One layer contained the epithelium and lamina propria (termed epithelial side) and the other layer contained the fibromuscular layer (termed smooth muscle side). Patients with a history of pelvic radiation, previous pelvic reconstructive surgery (for both control and POP groups), or connective tissue disorders such as Marfan syndrome or Ehler-Danlos syndrome were excluded from the study.

Total protein extracts were prepared from all samples while submerged under liquid nitrogen using a SPEX freezer/mill 6775. The frozen tissue samples were pulverized into a fine powder and then homogenized with a polytron handheld homogenizer in a protein extraction buffer that contained 20% glycerol, 0.5 M Tris buffer, 200 mM PMSF, 1% SDS, and protease inhibitor mix (Halt TM Protease inhibitor single-use cocktail).

Extracts were then loaded onto no-stain SDS-PAGE gels and separated via electrophoresis. Exposure of the gels to 1 minute of ultraviolet light activated the trihalo compounds embedded in the gel and allowed visualization of all protein bands in each lane that was captured using a ChemiDoc Imager. The gels were then scanned using Image Lab 6.0 software and the area under the curves of the protein bands profile integrated in order to determine total protein loaded per sample. As the trihalo compound and short time ultra violet light activation does not alter antigenicity of the target proteins, we directly blotted these exact same gels onto polyvinylidene difluoride membranes in only 3 minutes using a Trans-Blot Turbo Blotting System. We blocked the membranes in 5% non-fat dried milk for 30 minutes and then added our primary antibodies (in Tris-buffered saline) and incubated overnight at 4C. Membranes were then washed and incubated at room temperature for 1 hour with fluorescently tagged secondary antibodies. Target protein expression was then quantified using the ChemiDoc Imager and normalized to total protein loaded in each lane. The percentage change in target protein expression was then determined.

In addition, using the same Western blotting procedure described above we sought to determine the expression of our target proteins in various types of other muscle (cardiac and skeletal muscle) as well as bladder smooth muscle using human extracts of each of these. For these blots the same amount of total protein extract (12.5 µg) was added for each muscle extract and blotting was performed using the same primary and secondary antibodies as above.

RESULTS

We were able to identify a single band running at the appropriate expected molecular weight of 43 kDa for the SPHK1 isoform in vaginal samples from both the epithelial and smooth muscle side extracts. After normalizing to total protein in the gel it was determined that SPHK1 was expressed approximately 46% and 40% lower in smooth muscle side and epithelial side extracts, respectively, in POP samples compared to controls. We were also able to identify SPHK1 isoform expression in cardiac and skeletal muscle, but the presence of these enzymes in human bladder samples was

inconclusive. Using the same exact smooth muscle and epithelial side samples under identical conditions, we could not identify significant expression of the SPHK2 isoform in either control or POP samples (either in smooth muscle side or epithelial side samples).

We were also able to identify a single band running at the appropriate expected molecular weight of 49 kDa for the SPP1 isoform in samples from smooth muscle side extracts. After normalizing to total protein in the gel it was determined that the SPP1 isoform was expressed approximately 13% lower in smooth muscle side extracts in POP samples compared to controls. We could not identify SPP1 in epithelial samples. Again, we were also able to identify SPP1 isoform expression in cardiac and skeletal muscle, but the presence of these enzymes in human bladder samples was inconclusive.

INTERPRETATION OF RESULTS

Our novel data shows that SPHK1 is the predominant sphingosine kinase isoform in human anterior vaginal smooth muscle side and epithelial side tissue samples and that SPHK1 levels are decreased dramatically in women with POP compared to controls. Similarly, we demonstrated that SPP1 is the predominant sphingosine-1-phosphate phosphatase isoform in human anterior vaginal smooth muscle side extracts, but we could not detect SPP1 in epithelial side extracts. SPP1 levels were only approximately 13% lower in smooth muscle side extracts of women with POP compared to controls

The larger decrease in SPHK1 vs SPP1 expression would suggest a shift toward a higher sphingosine-to-S1P ratio and thus a shift toward apoptosis and cell cycle arrest and overall decreased vaginal wall stability. These findings suggest a POP preventative treatment strategy of stabilizing SPHK1 levels in the vaginal smooth muscle.

Our study utilized human samples making our findings translationally relevant. A limitation of our data is that only 5 control and 5 POP human samples were available. More samples will be analyzed in the future and SPP2 when available.

CONCLUDING MESSAGE

We demonstrate for the first time that major molecular components of the sphingosine-1-phosphate signaling pathway are present in the fibromuscular and epithelial/lamina propria layer of the human female vaginal wall. Our results further suggest that the SPHK1 and SPP1 isoforms are the major isoforms regulating the reversible conversion of sphingosine-to-S1P in the vaginal wall. The fact that the SPHK1-to-SPP1 expression ratio is decreased in response to POP points to a shift toward apoptosis and cell cycle arrest and overall decreased vaginal wall stability. The emerging S1P pathway may be an attractive target to control vaginal wall stability but also the stability of skeletal muscle that is altered in POP.

REFERENCES

1. Aponte MM, Rosenblum N. Repair of pelvic organ prolapse: what is the goal? Curr Urol Rep. 2014;15(2):385
2. Proia RL, Hla T. Emerging biology of sphingosine-1-phosphate: its role in pathogenesis and therapy. J Clin Invest. 2015;125(4):1379-87.
3. Aydin M, Downing K, Villegas G, Zhang X, Chua R, Melman A, DiSanto ME. The sphingosine-1-phosphate pathway is upregulated in response to partial urethral obstruction in male rats and activates RhoA/Rho-kinase signalling. BJU Int. 2010;106(4):562-71.

Funding Cooper Medical School of Rowan University Internal **Funding** **Clinical Trial** No **Subjects** Human **Ethics Committee** Cooper University Hospital **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "NOCTURIA"

GAPS IN CURRENT TREATMENT OF NOCTURIA

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HYPOTHESIS / AIMS OF STUDY

The current project seeks to review the treatment patterns of patients that are seen for nocturia in a high volume tertiary urologic center. We report the evaluation experience of patients presenting with nocturia and review their outcomes based on available therapies. The results will help understand this population and identify practice patterns or treatments that provide meaningful improvement in nocturia.

STUDY DESIGN, MATERIALS AND METHODS

A retrospective chart review was performed of new patient encounters seen in a functional urology practice from 5/1/2010 to 9/5/16 with the primary diagnosis of nocturia (ICD-9 788.43 and ICD-10 R35.1). Up to 3 visits within a 12-month period from the time of presenting were reviewed. Patients were excluded if they had undergone treatment for prostate cancer or bladder cancer, had a history of recurrent UTIs or had OAB predominant daytime symptoms. Patient characteristics including prior treatment, demographics, recommended treatments, and baseline nocturia number. Outcome was determined by patient reported improvement and change in nocturia events. If a patient completed a bladder diary, the following parameters were obtained: daytime voids, nighttime voids, 24-hour fluid intake and output, maximal voided volume, and 24 hour nocturnal polyuria index score (NPI). Nocturnal polyuria (NP) was defined as NPI $\geq$0.33 for all ages. Univariate analysis was performed using nonparametric independent tests, chi-squared analysis, and pearsons correlation using IBM® SPSS® software. A two-sided p $<$0.05 indicated statistical significance.

RESULTS

595 patients were identified, 182 were excluded and 403 were included for analysis. Of these, 239 (59%) were female, average age was 71 years (21-97) old and mean BMI was 25.6 (14-54). The median nocturia episodes were 4 (1–20) (Table 1). For patients that completed 3 visits, the mean nocturia events from the first visit improved from 4.1 to 2.96 episodes per night by the third visit (p=0.007). 192 patients (48%) reported previous treatment for nocturia. After the index visit, a bladder diary (BD) was utilized in 50% of patients, with a 63% (n=124) completion rate at follow up visit. On BD analysis, the most common etiologies of nocturia were nocturnal polyuria 76% (n=94) and bladder storage problems in 25% (n=31). Patient reported improvement with therapy after BD completion was 47% (n=34), similar to patients without voiding diaries (43% improvement, n=153). Behavioral treatment followed by anticholinergics and alpha blockers were the most commonly recommended, but no specific medication was associated with nocturia improvement (Figure 1). Oral desmopressin was used in 5% of patients.

INTERPRETATION OF RESULTS

Nocturia is a common condition and one where half of the patients seen had sought prior treatment. Patient follow up overall was poor, with over 50% of patients not returning for a third visit. With a myriad treatment options available, no particular therapy was associated with improvement suggesting these may be used in a "trial and error" fashion, which may lead to frustration and thus failure to follow up. In order to determine etiology, BD was recommended to half of the patients. Patient reported improvement with and without completion of a bladder diary was relatively low. We believe BD is the gold standard for treatment and suspect our follow up was relatively short to capture significant improvement. Use of Desmopressin was low, despite this being the most effective treatment for nocturnal polyuria. The study demonstrates that our prescribed use of treatments directed towards nocturia is modest at best or behavioral therapies that are directed toward nocturia are not complied with and follow-up is poor.

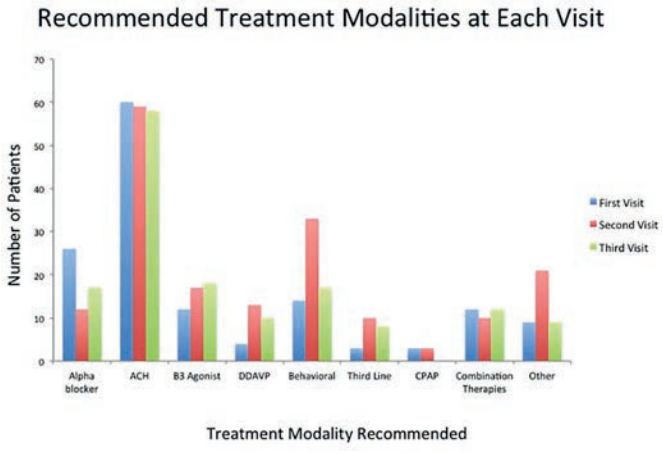
CONCLUDING MESSAGE

Nocturia is a highly prevalent symptom associated with many different disease processes and is associated with significant sequelae and morbidity. Success is relative to each patient and depends on the baseline condition. The incidence of NP was high in our population yet improvement was minimal and desmopressin use low. Currently employed measures tend to be nonspecific as half of patients do not complete a FVC and responses to therapy are suboptimal. Further work is needed to increase patient satisfaction and improve treatment of this prevalent condition.

FIGURE 1

Table 1: Patient Characteristics and Treatments	
Total Patients	403
Female	239 (59%)
Mean age	71 (21-97)
Mean BMI	25.6 (14-54)
Median number of nocturia episodes	4 (1-20)
Patients Prior treatment Type	192 (48%)
Alpha blocker	79 (19.6%)
Anticholinergic	108 (26.8%)
B3 Agonist	17 (4.2%)
Follow up Visit #1	292 (65%)
Initiated treatment	204 (70%)
Reported improvement	117 (40%)
Follow up Visit #2	193 (48%)
Initiated treatment	170 (88%)
Reported improvement	88 (46%)

FIGURE 2



Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** New York University Institutional Review Board **Helsinki** Yes **Informed Consent** No

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RESULTS OF TRANSURETHRAL RESECTION OF THE PROSTATE IN MALES WITH DETRUSOR UNDERACTIVITY

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HYPOTHESIS / AIMS OF STUDY

Transurethral resection of the prostate (TURP) in males with detrusor underactivity (DU) and bladder outlet obstruction (BOO) is debated.1,2

Aim of the study was to evaluate outcomes in males with detrusor underactivity (DU) underwent transurethral resection of the prostate (TURP).

STUDY DESIGN, MATERIALS AND METHODS

We prospectively evaluated 51 patients underwent TURP for lower urinary tract symptoms with urodynamics (UD) diagnosis of DU. All males were stratified in two cohorts: one with bladder outlet obstruction (BOO), and a second one without BOO. UD was performed according to Good Urodynamic Practice. DU was defined as BCI weak class and Schaefer nomograms contractility classes Very Weak or Weak. BOO was defined as International Continence Society (ICS) nomograms class obstructed and Schaefer nomograms obstruction classes III-VI. Follow-up was performed considering International Prostate Symptom Score (IPSS), uroflowmetry (UF), post-void residual urine (PVR) and PVR ratio obtained from the ratio of PVR to bladder volume (BV: voided volume + PVR). IPSS was also stratified in three classes of LUTS severity: 0-7 moderate, 8-19 fair, 20-35 severe. Patients' satisfaction was measured by VAS and a simple question. Q-square and T-Student tests were used for statistical analysis.

RESULTS

IPSS' class showed improvement in both groups, higher when BOO was associated to DU (p=0.037). In both groups no statistical difference was documented regarding improvement of IPSS median score (p=0.68), median peak flow (p=0.052), and PVR/PVR ratio (p=0.49). Subjective satisfaction was high in both groups. Patients' characteristic and outcomes are reported in Table 1 and 2.

INTERPRETATION OF RESULTS

TURP in patients with detrusor underactivity lead to a significant improvement in all functional outcomes. Significant improvements were achieved in both obstructed and unobstructed males, and patients with DU and BOO had better results but with no statistical difference.

Moreover, subjective satisfaction was high in both populations.

CONCLUDING MESSAGE

This study shows that the lack of BOO in patients with detrusor underactivity should not be excluding from surgical indications.

FIGURE 1

Table 1: Patients characteristics.

	All patients	BOO -	BOO +
Number of patients	51	28 (54.9%)	23 (45.1%)
Mean age (DS)	63.37 (±12.41)	63.2 (±12.82)	63.51 (±12.27)
Mean Follow-up, months (DS)	27.84 (±15.57)	26.91 (±13.7)	28.67 (±17.29)

Table 2: Patients results.

		All pts.	BOO -	BOO +
IPSS (mean)	***Pre TURP***	24.72	29.02	19.38
	Post TURP	9.83	14.1	4.5
	P	*0.0001*	0.002	0.0001
Qmax (mean)	***Pre TURP***	5.56	6.02	4.66
	Post TURP	13.33	11.93	16.01
	P	*0.0001*	*0.008*	*0.007*
RV [RV/(VV+RV)] (mean)	***Pre TURP***	198.24 (41%)	179.09 (36%)	233.33 (50%)
	Post TURP	22.47 (8%)	27.0 (9%)	14.17 (6%)
	P	*0.0008*	*0.03*	*0.007*
VAS mean (median)		7.14 (8)		
"Considering your outcome, are you satisfied of your choice to underwent TURP?"		YES 76.2% NO 23.8%		

FIGURE 2

Table 3: IPSS class improvement.

IPSS improvement	All patients	BOO -	BOO +
of one class	32.4% (12/37)	17.7% (3/17)	45% (9/20)
of two classes	67.6% (25/37)	82.3% (14/17)	55% (11/20)
Total improvement	72.5% (37/51)	60.7% (17/28)	87% (20/23)

REFERENCES

1. Gani J, Hennessey D: The underactive bladder: diagnosis and surgical treatment options. Transl Androl Urol, 2017 Jul;6(Suppl 2): S 186-195.
2. Kim M, Jeong CW et al: Effect of Preoperative Urodynamic Detrusor Underactivity on Transurethral Surgery for Benign Prostatic Hyperplasia: A Systematic Review and Meta-Analysis. J Urol, 2018 Jan;199(1):237-244.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Internal **Ethics Committee** Department of Urology AOUI Verona **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "REHABILITATION"

CAN YOU TRAIN THE PELVIC FLOOR MUSCLES BY CONTRACTING OTHER RELATED MUSCLES?

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HYPOTHESIS / AIMS OF STUDY

There is level 1A evidence for pelvic floor muscle training (PFMT) to be the first line treatment for stress and mixed urinary incontinence in women (1) . However, it has also been hypothesized that contraction of other muscle groups such as abdominals (m.rectus abdominis and the transversus abdominus muscle (TrA), hip adductors and external rotators could be used to activate the PFM (2).

The aims of the present study were firstly to assess whether contraction of muscles other than the PFM, activates the PFM sufficiently to provide a training effect, and secondly to assess the efficacy of a novel intra-vaginal pressure sensor (FemFit®) to simultaneously measure PFM contraction and intra-abdominal pressure (IAP) during all exercises.

STUDY DESIGN, MATERIALS AND METHODS

This was a cross-sectional experimental study using the FemFit® (3). The FemFit® is a prototype pressure sensor array, designed to fit the length of the vagina. The device is 80mm in length with eight evenly spaced pressure sensors encapsulated in a soft, medical grade silicone. The most distal sensors (7 & 8) are placed in the posterior fornex enabling measurment of intra-abdominal pressure (IAP). The remaining sensors will measure activation of other muscles, predominately the pelvic floor muscles. A convenience sample of 21 experienced pelvic floor physiotherapists, were invited to participate. Exclusion criteria were an inability to contract the PFM, pregnancy, being less than 12 months postpartum, > Stage 2 prolapse, and SUI > once a week. All participants self-inserted the FemFit® with the instruction: 'insert as you would a tampon'. Once the device was in-situ, ability to contract the PFM was assessed by visual observation of the perineum, and in-drawing of the FemFit®. The procedure started with a 30 second relaxation followed by three maximal contractions of the PFM. Three contractions of the following muscle groups were then performed in random order: internal rotation of the hips, external rotation of the hips, abduction of the hips, adduction of the hips, contraction of the gluteal muscles, pelvic tilt (primarly M. Rectus abdominis), indrawing (primarly TrA),abdominal crunch (primarly M. Rectus abdominis), deep inspiration and deep expiration. The procedure concluded with 30 second relaxation and then a double cough. All activities were performed in the supine position. Maximum pressures were determined for each pressure sensor, for each exercise/maneuver. The maximum pressures were then averaged across the three repetitions of each exercise. The sensors measuring the highest pressures, during the PFMC's were deemed to represent the location of the pelvic floor. Sensor 8 represented abdominal pressure. Wilcoxon paired tests were used to ascertain the difference in PFM pressure between exercises, and if there were differences in the pressures between the PFM sensors and the abdominal sensors for each exercise. Bonferroni correction was applied setting $\alpha = 0.005$.

RESULTS

Twenty-one women completed the procedure, with two sets of data not available for analysis due to issues with data collection. Mean age of the participants were 43.7 years (SD ±11.3) range 26 – 62 years. Mean BMI was 22.4 kg/m2 (SD ±3.2 kg/m2). Sixteen participants were parous, with a median parity of 2. Mean PFM pressure for PFMC was 16.29 mmHg (SD ±12.28) range 4.21 – 40.69 mmHg, but only 9 women had a pressure increase of > 10 mmHg. PFM pressure was greater during a PFMC compared to all other exercises, except for curl-ups and cough (Table 1). However, for the curlup exercises we observed pressure higher than PFMC pressure in only 5 participants, and lower in 14.

Table 1:Estimated pressure difference between PFMC pressure and PFM pressure for all exercises.

Wilcoxon tests showed a significantly higher PFM pressure than IAP for PFMC, internal rotators and gluteals ($p < 0.001$) (Fig 2).

Fig.2: Box and whisker plot (Medians, 25%, 75% quartiles) for PFM and IAP for all exercises.

INTERPRETATION OF RESULTS

PFM pressure during a PFMC was more than that measured for any other exercise, except for cough and curlups. There is a possibility co-contraction of the PFM occurs during a curlup. However, the magnitude of the difference between PFM pressure and IAP for curlups is trivial. The magnitude of the difference from a PFMC is significant. It was surprising that more than half the physiotherapists had a very weak PFMC.

CONCLUDING MESSAGE

Co-contractions of the PFM during contraction of other muscle groups are mostly minor. Targeted PFMC should still be recommened. The FemFit was able to distinguish between pressures developed in the region of the pelvic floor muscles and IAP.

FIGURE 1

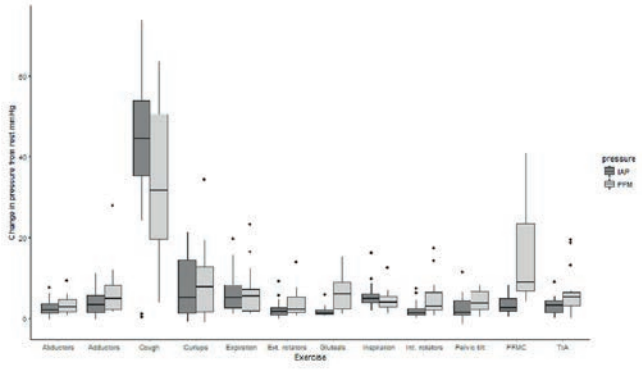

FIGURE 2

Exercise/ Maneuvers	Estimated diff from PFMC mmHg	99% CI	P value
TrA	10.0	3.4 – 17.0	<0.001
Gluteals	8.7	2.3 - 19.5	<0.001
Ext Rotators	13.6	4.7 - 24.2	<0.001
Int Rotators	9.1	3.7 - 16.5	<0.001
Pelvic tilt	13.0	3.2 - 23.1	<0.001
Inspiration	10.8	2.1 - 21.1	<0.001
Expiration	10.1	11.1 - 20.4	0.001
Curl-ups	6.6	-0.6 - 18.3	0.009
Cough	-17.0	-35.9 - 2.0	0.013

REFERENCES

1. Dumoulin C, Hay-Smith J, Berghmans B, Burgio K et al. Adult Conservative management. In: Abrams P, Cardozo L, Wagg A, Wein A (eds) Incontinence. 6th International Consultation on Incontinence, Tokyo Paris, 2016. Committee 12; 1443-1628. Health Publications Ltd, Portsmouth.
2. Bø K, Herbert R: There is not yet strong evidence that exercise regimens other than pelvic floor muscle training can reduce stress urinary incontinence in women: A systematic review. J Physiotherapy, 59,3: 159-168 2013
3. Schell A, Budgett D, Nielsen P, Smalldridge J, Hayward L, Dumoulin C, et al. Design and development of a novel intra-vaginal sensor array. Neurourol Urodyn. 2016;35(4):S355-6.

Funding There no disclosures and funding was provided by the Ministry for Business Innovation and Employment, Endeavour Fund and Health and Research Council of New Zealand. **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** University of Auckland Human Participants **Ethics Committee** (ref 017618) **Helsinki** Yes **Informed Consent** Yes

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PELVIC FLOOR MUSCLE TRAINING AS A TREATMENT APPROACH FOR GENITOURINARY SYNDROME OF MENOPAUSE

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HYPOTHESIS / AIMS OF STUDY

Genitourinary syndrome of menopause (GSM), which affects up to 50% of postmenopausal women, is defined as a collection of genital and urinary symptoms and signs associated with a decrease in estrogen and other sex steroids. It leads to changes to the labia majora/minora, clitoris, vestibule/introitus, vagina, urethra and bladder. Current treatments, i.e. local hormonal therapy (HT) or systemic HT and vaginal moisturizer, may not be suitable for some women and may cause adverse effects or allergies. Also, some women prefer not to use HT. In a US survey of women with GSM, 59% of women receiving treatment reported still feeling symptoms and to be "not satisfied" with their present treatment efficacy [1]. Therefore, there is a real need to investigate safe and effective complementary GSM treatments.

In a recent case study, a pelvic floor muscle (PFM) training program appeared to reduce GSM symptoms and signs [2]. It can be hypothesized that these results are related to improvement in vulvovaginal blood flow, tissue elasticity, pH and/or PFM tone [2]. However, no cohort study has yet investigated the effect of PFM training on GSM.

The primary aim of this study was to investigate the effect of a PFM training program on the most bothersome symptom (MBS) of GSM, in postmenopausal women. The secondary aim was to assess the effect of a PFM training program on GSM signs, activities of daily living, quality of life and sexual function.

STUDY DESIGN, MATERIALS AND METHODS

Postmenopausal women with GSM, aged 55 or over, were recruited for this cohort study from a mother-study on urinary incontinence. The diagnosis of GSM was confirmed by a gynecologist based on a standardized assessment. Subjects with vulvar dermatological diseases, gynecological radiation, vaginal or urinary tract infections within the previous three months, and those taking antiestrogenic medication, were excluded. Dosage of HT medication and use of a vagi-

nal moisturizer had to be stable for at least six months before the study to ensure symptom stability.

Each woman participated in two pre-intervention evaluations (PRE1 and PRE2), a 12-week PFM training program and a post-intervention evaluation (POST). PRE1 included questionnaires on severity of GSM symptoms (MBS questionnaire) and their impact on activities of daily living (Atrophy symptoms questionnaire) as well as condition-specific questionnaires on quality of life and sexual function (ICIQ-VS and ICIQ-FLUTSsex). GSM signs were assessed with the Vaginal Health Assessment scale. PRE2 was conducted two weeks later to document the stability of GSM symptom and sign measurements. POST was the same assessment as PRE1.

After ensuring correct PFM contraction, the 12-week PFM training program included a weekly one-hour PFM training program with a physiotherapist and daily home-based progressive PFM exercises.

One-way repeated ANOVA were used to investigate the differences in outcome measures assessed at PRE1, PRE2 and POST. A paired-samples t-test was used to detect statistical differences in outcomes evaluated at PRE1 and POST.

RESULTS

Thirty-one women with a mean age of 68.0 ± 6.6 years and mean parity of 1.8 ± 1.1 were recruited. Twenty participants were sexually active (having intercourse). Twelve participants had treatment for GSM symptoms (local HT: 8; systemic HT: 2; vaginal moisturizer: 2) whose dosage and use remained stable during their study participation. Three women dropped out of the study for personal reasons (time constraint).

Overall, as shown in Table 1, the severity of the GSM symptoms on the MBS questionnaire decreased significantly after the PFM training program ($p<0.01$) with improvement in the severity of the MBS in 22/29 of women (76%) and no change in 7/29 of them (24%). None of the participants had an increase in MBS severity after the intervention. GSM signs improved on the Vaginal Health Assessment scale, particularly vaginal secretions, vaginal epithelial thickness and vaginal color ($p<0.01$). The impact of GSM symptoms on activities of daily living as measured by the Atrophy Symptom questionnaire was reduced significantly ($p<0.01$). There was a reduction of the impact of GSM on quality of life (ICIQ-VS QoL subscale; $p<0.01$) and on sexual function (ICIQ-VS sexual matters subscale; $p<0.01$; ICIQ-FLUTSsex; $p=0.01$).

INTERPRETATION OF RESULTS

PFM training has been shown to improve symptoms of urinary incontinence and prolapse in the past. To our knowledge, this is the first study to assess the impact of a PFM training program on the symptoms and signs of GSM. After a 12-week PFM training program, improvements in the severity of the MBS of GSM were found. On physical assessment, vaginal secretions, vaginal epithelial thickness and vaginal color were improved after the intervention. A reduction in GSM's impact on activities of daily living, quality of life and sexual function was also shown.

Similar results were obtained after a PFM training program in women with gynecological cancer, for whom radical hysterectomy and radiotherapy cause symptoms that relate to those of GSM [3].

With the high proportion of women treated for GSM still reporting symptoms and being "not satisfied" with current treatment efficacy [1], PFM training could become a treatment of interest alone or as a complimentary therapy for women with GSM. Moreover, as it is safe and without side effects, it could be used in women for whom local HT is contraindicated or in those having adverse effects with their GSM treatment (vaginal irritation, vaginal bleeding, breast pain, allergy).

CONCLUDING MESSAGE

Our research findings are original as they suggest that a PFM training program improves both GSM symptoms and signs, as well as reducing the impact of GSM on activities of daily living, quality of life and sexual function. A randomized controlled trial is now needed to confirm these results.

FIGURE 1

Table 1. GSM outcome measures

	PRE1[1]	PRE2[2]	POST[3]	p value
MBS severity (/3)	2.4 ± 0.7	2.3 ± 0.7	1.4 ± 0.9	p^{1-2}= 1.0, p^{2-3}<0.01*, p^{1-3}<0.01*
Vaginal Health Assessment				
Vaginal secretions (/3)	1.5 ±0.8	1.5 ±0.8	0.9 ±0.4	p^{1-2}= 1.0, p^{2-3}<0.01*, p^{1-3}<0.01*
Vaginal epithelial integrity (/3)	0.3 ±0.5	0.4 ±0.5	0.2 ±0.5	p^{1-2}= 1.0, p^{2-3}=0.17, p^{1-3}=0.63
Vaginal epithelial thickness (/3)	1.6 ±0.6	1.5 ±0.6	1.0 ±0.4	p^{1-2}= 1.0, p^{2-3}<0.01*, p^{1-3}<0.01*
Vaginal color (/3)	1.2 ±0.7	1.2 ±0.6	0.4 ±0.6	p^{1-2}= 1.0, p^{2-3}<0.01*, p^{1-3}<0.01*
Vaginal pH (/3)	2.4 ±0.7	2.3 ±0.8	2.1 ±0.8	p^{1-2}= 1.0, p^{2-3}=0.68, p^{1-3}=0.14
Total score (/3)	1.4 ±0.5	1.4 ±0.4	0.9 ±0.4	p^{1-2}= 1.0, p^{2-3}<0.01*, p^{1-3}<0.01*
Atrophy Symptom Questionnaire (/3)	0.8 ±0.4	0.9 ±0.4	0.4 ±0.3	p^{1-2}= 1.0, p^{2-3}<0.01, p^{1-3}<0.01

*Statistically significant (p<0.05)

FIGURE 2

Table 2. Patient reported outcomes

	PRE1	POST	p value
ICIQ-VS QoL subscale (/10)	3.0 ±3.3	0.8 ±1.4	<0.01*
ICIQ-VS sexual matters subscale (/58)	39.2 ±16.7	23.7 ±14.0	<0.01*
ICIQ-FLUTSsex (/14)	6.7 ±3.1	4.9 ±3.5	0.01*

*Statistically significant (p<0.05)

REFERENCES

1. Kingsberg, S. A., et al. (2017). "The Women's EMPOWER Survey: Identifying Women's Perceptions on Vulvar and Vaginal Atrophy and Its Treatment." The Journal of Sexual Medicine 14(3): 413-424.
2. Mercier, J., Morin, M., Lemieux, M. C., Reichetzer, B., Khalifé, S., & Dumoulin, C. (2016). Pelvic floor muscles training to reduce symptoms and signs of vulvovaginal atrophy: a case study. Menopause, 23(7), 816-820
3. Yang, E.J., et al., Effect of a pelvic floor muscle training program on gynecologic cancer survivors with pelvic floor dysfunction: A randomized controlled trial. Gynecologic Oncology, 2012. 125(3): p. 705-711.

Funding Fonds de recherche en santé du Québec, Quebec Network for Research on Aging, Ordre professionnel de la physiothérapie du Québec **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Institutional Review Board of the Institut universitaire de gériatrie de Montréal (Montreal, Canada) **Helsinki** Yes **Informed Consent** Yes

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DOES BIOFEEDBACK OPTIMIZE THE EFFECT OF PELVIC FLOOR MUSCLE EXERCISES ON STRESS URINARY INCONTINENCE IN WOMEN? A SYSTEMATIC REVIEW

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HYPOTHESIS / AIMS OF STUDY

Pelvic floor muscle exercises (PFMEs) are an effective treatment for women with stress urinary incontinence (SUI), and biofeedback is often used to maximize its effect. However, conflicting results about the significant advantages of adding biofeedback to PFMEs on managing SUI have been reported, and studies provide little insight about the reasons for inconsistent results. This systematic review aimed to: 1) explore the effect of PFMEs plus biofeedback protocols compared to PFMEs only protocols on pelvic floor muscle strength (PFMS), objective symptom alleviation, subjective symptom alleviation, and quality of life, and 2) describe the intervention protocols to assess the potential factors influencing inconsistent outcomes.

STUDY DESIGN, MATERIALS AND METHODS

PRISMA guidelines were followed[1]. PubMed, CINAHL, and Embase databases were searched for eligible studies published from January 1, 2001 to September 15, 2017. Search strategies were developed through consultation with a health science librarian. Randomized controlled trials (RCTs) and quasi-experimental trials having at least two groups, i.e., PFMEs plus biofeedback versus PFMEs only, of women diagnosed with SUI were selected. Studies of pregnant women and perinatal women were excluded because their unique treatment needs fell outside the scope of this review. Narrative reviews, commentaries, case reports, and study protocols were excluded from this review.

RESULTS

Of 1757 studies identified by searching strategies, seven studies (all RCTs) met the inclusion criteria. Six were 2-arm RCTs and one was 3-arm RCT with a blank control group.188 women were in the PFMEs groups, 193 in the PFMEs plus biofeedback group, and 16 in a blank control group. Four studies lacked sufficient sample size for statistical inference, and only one study fit 5 of the 6 criteria for Cochrane risk of bias[2](see Figure 1). Women's age in seven studies ranged from 46.6 to 58.3 years old, and four studies reported symptoms duration of SUI ranged from 5 to 9.7 years.

INTERPRETATION OF RESULTS

Large variations in intervention protocols were evident across studies including:1) content of education, i.e., information about PFM anatomy/function; 2) mode of education, i.e., individual versus group education; 3) healthcare organization-based training, i.e., methods used to verify initiation of muscle contraction, training plans and revisit appointments with physiotherapists or other health care professionals; 4) support for transition from healthcare organization-based training to home-based training; 5) home-based training, i.e., training plans that differ across studies and from those delivered in healthcare organizations, partial or no adherence monitoring and promoting strategies; and 6) the lengths of intervention programs (see Table1).

To measure outcomes, five studies reported PFMS by using objective tools (i.e., electromyography, perineometry or pressure transducer) or the subjective measure (i.e., Modified Oxford scale[3]). Three studies used the pad-test to evaluate objective symptom alleviation. Subjective symptom measures used in five studies were self-administered questions with no report of reliability and validity. Three studies reported quality of life using, "Incontinence Quality of Life Instrument", "International Consultation on Incontinence Questionnaire -Short Form", or "King Health Questionnaire".

For PFMS, four studies showed no significant effect from biofeedback, and one study using Modified Oxford scale showed sustained significant biofeedback effect during and at the end of the intervention (both time frames, $p<0.05$). There was limited evidence (one study with $p<0.05$ after the intervention) about the additive effect of biofeedback to PFMEs on alleviating objective symptoms using the pad-test. In addition, no evidence was presented on the benefit of adding biofeedback to PFMEs on alleviating subjective symptom and improving quality of life during intervention and/or follow-up period.

CONCLUDING MESSAGE

Evidence about the additive effect of biofeedback is limited in this review due to lack of statistical power, high risk of bias for the RCTs, variations in intervention protocols, and hidden bias (e.g., lack of adherence monitoring and reliable assessment tools embedded in included studies). Moreover, variations in the intervention protocols and assessment tools limit the generalization of findings across studies. Rigorous RCTs, using similar protocols and rigorous trial methodology, are required to clarify the effect of adding biofeedback to PFMEs in the treatment of women with SUI.

FIGURE 1

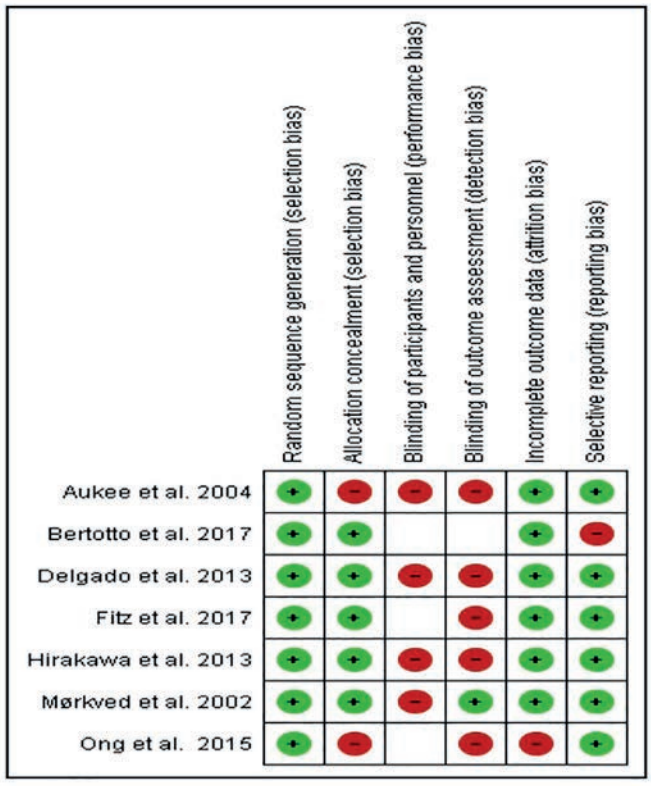

Figure 1 Risk of bias summary

FIGURE 2

Table 1 Intervention protocols of included studies

Authors (year)	Knowledge education			Healthcare Organization-based Training			Transition Education	Home Training		Length of intervention (weeks)
	PFM * anatomy	PFM function	Education mode	Start verification †	Training plan	Revisit times		Training plan	Adherence monitoring	
Mørkved et al. (2002)	yes	n/r*	individual	•verbalization •palpation •observation	coached 3 sets endurance-speed contraction	16	verbal instruction	•endurance-speed training •one time/day	n/r	24
Aukee et al. (2004)	yes	n/r	group	•verbalization •palpation	coached 3 sets endurance-relaxation contraction	5	verbal and written instructions	•endurance-speed training •five times/week	training diary	12
Hirakawa et al. (2012)	yes	yes	individual	•muscle activity signals	n/r	5	verbal and written instructions	•endurance-speed training •twice/day	training diary	12
Delgado et al. (2013)	yes	yes	individual	•verbalization	verbal and leaflet instruction only	3*	verbal instruction	•endurance-speed training •twice/day	training diary &follow up by phone	16
Ong et al. (2015)	n/r	n/r	n/r	•verbalization	coached 3-5 sets endurance-relaxation–speed-relaxation contractions	4	n/r	•n/r	n/r	16
Fani Fitz et al. (2017)	n/r	yes	group	•verbalization •palpation •observation	coached out-patient protocol	6	n/r	•personalized protocol	training diary	12
Bertotto et al. (2017)	yes	n/r	group	•palpation	coached 1-2 sets endurance-relaxation contractions&2-5 sets speed-relaxation contractions	8	written instruction	•same as in healthcare organization •twice/day	n/r	4

Note.
*PFM= pelvic floor muscle; * n/r =not reported; †Start verification means methods used to make sure that participants can contract their pelvic floor muscle in the right way; revisit times*3 = 1 telephone follow-up and 2 face-to-face interviews about training technique

REFERENCES

1. Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2010). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. International journal of surgery, 8(5), 336-341.
2. Higgins, J.P. and S. Green, Cochrane handbook for systematic reviews of interventions, 2005, version.
3. Laycock, J. and D. Jerwood, Pelvic floor muscle assessment: the PERFECT scheme. Physiotherapy, 2001. 87(12): p. 631-642.

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RELIABILITY OF INTRAVAGINAL PRESSURE MEASUREMENTS DURING MAXIMAL VOLUNTARY PELVIC FLOOR MUSCLE CONTRACTION AND VALSALVA IN LYING AND STANDING POSITIONS

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HYPOTHESIS / AIMS OF STUDY

Several intravaginal manometers aim to measure pelvic floor muscle (PFM) pressure during maximal voluntary contraction, but none, up until now, have the ability to reliably measure intravaginal pressure during a Valsalva manoeuver. The possibility to acquire reliable intravaginal pressures during a Valsalva task is likely to be useful both for understanding the role of intra-abdominal pressure variations on pelvic floor dysfunction such as prolapse or urinary incontinence, and for decision making when choosing PFM safe exercises. The aim of this study is to test the reliability of intravaginal pressure measurements during PFM maximal voluntary contraction and Valsalva manoeuver while lying and standing using the FemFit®, a new intra-vaginal pressure profile device.

STUDY DESIGN, MATERIALS AND METHODS

Twenty healthy adult women participated in this prospective test-retest cohort study. Exclusion criteria were: pregnancy, pathology or medication likely to interfere with PFM function. One physiotherapist (FR) coordinated three sets of repeated measurements using the FemFit®. For each set, three PFM maximal voluntary contractions and Valsalva manoeuvers were acquired in lying and standing positions. Two sets were done on the same day, with 15 min rest between them (session 1: T1, T2), and a third set was done approximately a month apart (session 2: T3) at the same time of the day (±2 hours) and at the same phase of the women's menstrual cycle. Participants were asked to not perform PFM training between sessions.

The FemFit® contains an array of eight pressure sensors (MS5803-02BA, Measurement Specialties, United States), which are mounted onto a flexible printed circuit (FPC) board to allow the device to conform to the anatomy of the vagina. It has a total length of 80 mm, a maximum width of 20 mm and a 4.1 mm thickness, which allow the absolute pressures within the vagina to be measured, without the device imposing a pressure on the vaginal walls (Figure 1). The contoured edges cover a distance of 55 mm and are designed to sit within the rugae of the vaginal wall to reduce device movement. The cover is made out of a soft, biocompatible silicone (MED-4901, NuSil, United States), and cast using a

silicone transfer press. Data is transmitted to an Android tablet for data logging and real-time display and user feedback. Each pressure sensor sampled at a rate of 100 Hz.

Before each measurement session the FemFit® was disinfected, covered with a condom and lubricated with hypo-allergenic gel. The physiotherapist, then, inserted the FemFit® into the participant's vaginal cavity in an anterio-posterior axis. The device position in the vagina was verified after every task. Further, at the end of the session, women were asked for any discomfort related to the FemFit®. Test-retest reliability on lying and standing positions was assessed using intraclass correlation coefficient (ICC) and Bland-Altman plots. The mean maximum pressure (across sensors 1 to 8) from 3 PFMC/Valsalva trials (for each set and position) was used for the analysis.

RESULTS

Demographics of the participants are summarized in Table 1. One participant was excluded for not being able to follow the physiotherapist instructions and three did not return for the second evaluation for reasons outside of the scope of the study. The FemFit® unit had to be repositioned on two occasions between Valsalva trials, in the lying position and on four occasions between Valsalva trials, in the standing position. No women reported any discomfort during the assessment sessions.

Among the data set, 45 of the 48 pressure profiles obtained were adequate for analysis. All comparisons showed excellent reliability (intra or inter sessions, Table 2).

INTERPRETATION OF RESULTS

Results from this test-retest study indicate excellent repeatability for PFM maximal voluntary contraction and Valsalva both on standing and lying positions within and between sessions. For all PFM maximal voluntary contraction comparisons the repeatability results were reinforced by the Bland-Altman plot analysis, which showed narrow limits of agreement. Similar results were observed for the Valsalva in lying position within and between sessions. However, for the Valsalva task, especially during standing, even though excellent ICC results were observed, a higher difficulty level in measuring this condition was suggested by wider 95% confidence interval and limits of agreement on Bland-Altman plots (spanning 31.3 to 43.3 mmHg). This was confirmed by our observation and need to reposition the unit in the vagina.

In another reliability study, using a manometer (air-filled silicone balloon) excellent repeatability was also reported for PFM maximum contraction measurements in lying and standing [2]. However, the validity of such measurements can be questioned as the large size balloon will alter the size of the vaginal cavity and therefore could influence the pressure measure as oppose to the proposed device.

Further, no reliability studies using a manometer were found for Valsalva manoeuvers. In contrary to other types of manometers which would have to be held in place during PFM contraction or Valsalva tasks not to be removed from the vagina, the small size FemFit® was shown never to be displaced during the contraction task and most of the time for the Valsalva tasks, in the lying or standing position.

CONCLUDING MESSAGE

Our research findings are original as they suggest that intravaginal pressures can be reliably measured during PFM maximal voluntary contraction and Valsalva manoeuver while lying and standing, using the FemFit®. No discomfort was experienced during measurement, and the FemFit remained in position most of the time. Only the Valsalva task, in standing position showed high variability within and between sessions. More research is needed to assess the FemFit validity to characterize intravaginal pressure profiles, distinguishing patterns of pressure distribution corresponding to each task and body position.

FIGURE 1

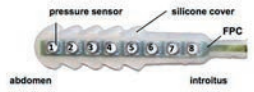

Figure 1. FemFit® device [1]
Eight pressure sensors arranged in array, covering 80mm of the vaginal cavity from the introitus.

Table 1 Subject demographics

n=20	Data
Age mean ± SD (years)	51.5 ± 19.7
BMI (kg/m2)	24.5 ± 4.0
Parity (%)	
Nulliparas	45%
Primiparas	5%
Multiparas	50%
Menopausal status (%)	
Pre- menopausal	55%
Post- menopausal	45%
Digital palpation - median (min-max)	
oxford right	4 (1 to 5)
oxford left	4 (1 to 5)

FIGURE 2

Table 2 Reliability of pressure profile measurements while lying and standing

			Bland-Altman plots	ICC	
within session	Mean T1 ± SD	Mean T2 ± SD	Mean difference (limits of agreement)	ICC (95% CI)	*p* value
PFMC lying (mmHg)	12.59 ± 8.76	12.14 ± 7.39	0.61 (5.4 to -4.2)	0.98 (0.93 to 0.99)	<0.001
PFMC standing (mmHg)	11.51 ± 4.52	14.21 ± 7.03	-2.70 (6.3 to -11.7)	0.78 (0.35 to 0.93)	0.001
Valsalva lying (mmHg)	16.52 ± 10.75	13.48 ± 9.26	3.53 (16.4 to -9.3)	0.86 (0.57 to 0.95)	<0.001
Valsalva standing (mmHg)	23.05 ± 13.83	22.64 ± 9.92	0.41 (16.1 to -15.2)	0.88 (0.65 to 0.96)	<0.001
between sessions	Mean T1 ± SD	Mean T3 ± SD			
PFMC lying (mmHg)	12.59 ± 8.76	14.06 ± 8.67	-0.53 (12.7 to -13.8)	0.78 (0.30 to 0.93)	0.006
PFMC standing (mmHg)	11.51 ± 4.52	10.31 ± 5.78	1.20 (9.1 to -6.7)	0.82 (0.50 to 0.94)	0.001
Valsalva lying (mmHg)	16.52 ± 10.75	17.58 ± 10.39	-1.06 (14.9 to -17.0)	0.83 (0.52 to 0.94)	0.001
Valsalva standing (mmHg)	23.05 ± 13.83	20.09 ± 12.06	2.75 (24.4 to -18.9)	0.79 (0.38 to 0.93)	0.003

PFMC pelvic floor muscle contraction; ICC intraclass correlation coefficient; SD standard deviation; limits of agreement= mean difference ± 1.96*SD

REFERENCES

1. Schell A, et al. Neurourol Urodyn 2016;35:S355-356.
2. Frawley HC, et al. Neurourol Urodyn 2006;25:236–42. doi:10.1002/nau.20201.

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PELVIC FLOOR MUSCLE ACTIVATION DURING CONTRACTIONS OF THE MUSCLES SURROUNDING THE PELVIC FLOOR

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HYPOTHESIS / AIMS OF STUDY

Electromyography (EMG) using intra-vaginal and/or intra-anal probes is widely used and considered a reliable method of assessing the activity of the pelvic floor musculature (PFM). Some authors have questioned the validity of these probes because of the fear of crosstalk. The crosstalk phenomenon is described as the detection by the EMG of a signal originating from a neighbouring muscle rather than exclusively from the muscle under investigation(1).

The activation of muscles surrounding the pelvic floor, such as abdominal or hip musculature, during a PFM contraction has been described before. In literature, it has been emphasized that exercise of the PFM should be performed in isolation without abdominal or hip muscle activity. Contraction of the adductors and gluteal muscles during PFM exercise is considered incorrect as these actions may occur without concurrent PFM muscle activity. Some authors found that it was not possible for continent women to fully contract their PFM without also contracting the transversus abdominis and the internal obliques. Furthermore they were not able to perform a maximal voluntary contraction (MVC) with their PFM without a rise in EMG activity in the lower portion of rectus abdominis. Other authors suggested that cross-talk also could be co-activation of PFM. In a scoping review the authors identified a gap in scientific knowledge regarding to the relation between contractions of muscles surrounding the pelvic floor and pelvic floor muscle activation(2).

A better understanding of how these muscles influence each other could be used to enhance pelvic floor muscle function and benefit patient outcome.

The aim of this study was: To describe the effect of the contractions of the muscles surrounding the pelvic floor and the EMG activity of the pelvic floor muscles (PFM) with a bi-polar EMG probe and the MAPLe(3).

STUDY DESIGN, MATERIALS AND METHODS

Healthy Pelvic Floor Physiotherapists without complaints of micturition, defecation, sexual dysfunction and or pain and not having pelvic surgery in the past were approached by mail if they want voluntarily participate in this research.

EMG activity for the abdominal, gluteal, abductor, and adductor muscles on the right side of the volunteers was recorded with surface electrodes. In supine the women lay flat with a pillow under the head and with the thighs slightly abducted..

Surface electrode pairs were oriented along the line of action of the underlying muscle fibres on the right side: rectus abdominis (RA), transversus abdominis (TA), external obliques (EO), internal obliques (IO), abductors and adductors. A reference electrode was placed over the right anterior superior iliac spine (ASIS) (Figure 1).

The volunteers were asked to perform the following activities: one minute rest, 10 MVC's and three (selectively) provoked contractions of the Adductors, Gluteal, Abductors, Rectus Abdominus, Obliques and Transversus Abdominus were performed. Furthermore, EMG was recorded with a bipolar probe (Periform) and repeated with the MAPLe®, a monopolar probe, both placed intra-vaginally.

During the provoked contractions of the muscles surrounding the Pelvic Floor a MicroFET 2® Handheld Dynamometer was used to record resistance force (Newton) to ensure similar effort during the provoked activation.

For the bipolar probe and the muscles surrounding the pelvic floor, raw EMG signals were acquired at a sample rate of 2,048 Hz. For each bipolar signal, the root mean square was calculated using a window of 205 samples (0.1 sec). For the MAPLe, the raw EMG signals were acquired at a sample rate of 1,000 Hz, the root mean square was calculated using a window of 100 samples (0.1 sec) and an average EMG of all 24 electrodes was taken for the analysis in this abstract. For tone at rest, an average was calculated for both probes. For the MVCs and the activity on the probes during a provoked activation an average of the peaks of individual contractions was calculated. The activation of the PFM was compared to tone at rest and MVC with paired T-Tests to find significant differences.

RESULTS

Fifteen volunteers were included in this study with a mean age of 45, 7 years (range; 28-63). Seven women were premenopausal and 8 postmenopausal with a mean of Gravida 1, 2 (range 0-3) and delivery of 1, 3 (range 0-3).

All contractions of muscles surrounding the pelvic floor result in a co-activation of the PFM.

For the MAPLe peak EMG activity for all contractions of the muscles surrounding the pelvic floor were significantly higher than average tone at rest and lower than MVC peak activity, except the peak activity of the abductors. For the bipolar probe this contraction was also significantly lower (Figure 2). In some cases the average peak EMG activity of co-activation of the PFM was higher than the volunteers' average peak EMG activity of MVC (for the bipolar probe; 7 cases in 3 volunteers, for the MAPLe: 8 cases in 5 volunteers).

During MVC, an increase in EMG activity of the Abdominal, Obliques (IO/EO) and Rectus Abdominus muscle was recorded in 7 out of 15 volunteers.

INTERPRETATION OF RESULTS

During contraction of all surrounding muscles separately there was a significant increase in peak EMG activity of the pelvic floor compared to the activity of tone at rest. For all surrounding muscles, the peak EMG activity of MVC was significantly lower except for the peak activity of the MAPLe during abductor muscle contraction. This indicates that there is a co-activation of the PFM which is higher than rest, but lower than MVC and not, as some described in literature, crosstalk from the surrounding muscles. Perhaps the recorded co-activation is an involuntary reflex contraction to counteract the sudden increase in pressure or it could be that there is in fact 'crosstalk' across different nerves or nerve branches during these types of contractions, causing a contraction of the PFM. This could also be one of the reasons why in some cases the co-activation was higher than the maximal voluntary contraction.

The relation between the muscles surrounding the pelvic floor and the PFM are in line with findings regarding lower back pain and the high incidence of incontinence (some report up to 70%) which could indicate there is a link between the musculature of the lower back and the PFM.

That some volunteers were unable to perform a PFM contraction without also contracting one or more muscles surrounding the pelvic floor is in line with literature.

What the bipolar probe is actually measuring is still unclear; since the use of a bipolar configuration comparing different sides to one-another in combination with large electrodes covering multiple muscle layers is under debate. Next step will be to look at differentiated EMG nearest to individual muscles on different sides and different depths of the pelvic floor, recorded with the MAPLe, to provide even more insight behind the working mechanisms of (co-activation of) the PFM.

CONCLUDING MESSAGE

This is the first study that shows that all contractions of muscles surrounding the pelvic floor result in PFM contractions. Knowledge about co-activation of PFM could potentially help to improve PFM function and benefit patient outcomes.

FIGURE 1

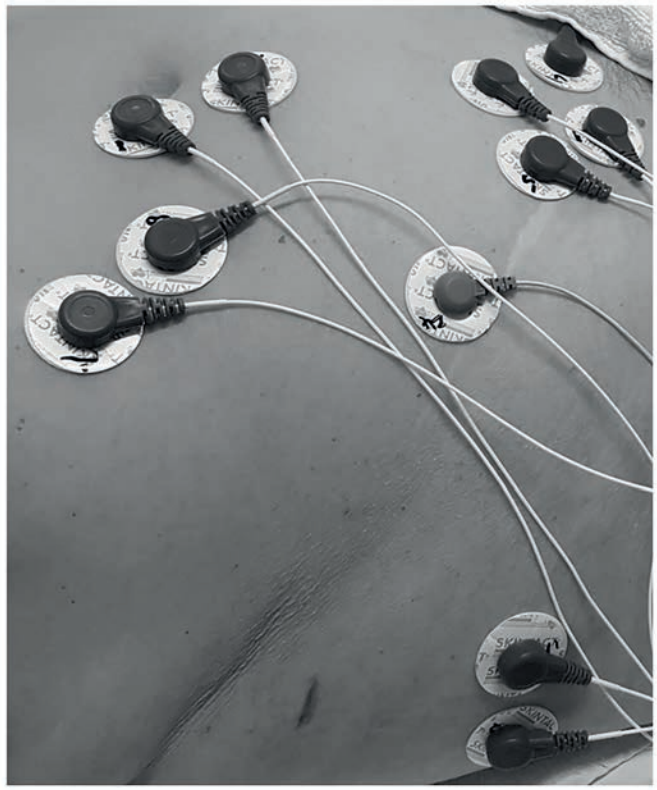

Figure 1: Location of electrodes for the registration of activity of muscles surrounding the PFM. 1: Rectus abdominus, 2: Transversus Abdominus, 3: Internal Obliques, 4: Reference electrode, 5: Abductors, 6: External Obliques, Not shown: Adductors, Gluteal

FIGURE 2

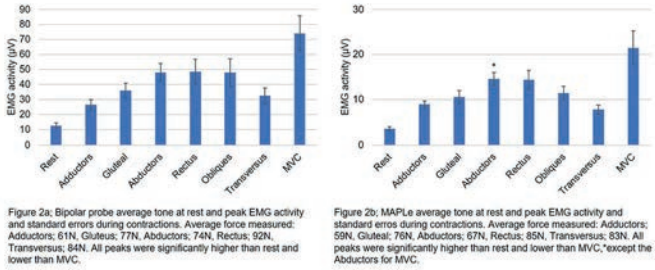

Figure 2a; Bipolar probe average tone at rest and peak EMG activity and standard errors during contractions. Average force measured: Adductors; 61N, Gluteus; 77N, Abductors; 74N, Rectus; 92N, Transversus; 84N. All peaks were significantly higher than rest and lower than MVC.

Figure 2b; MAPLe average tone at rest and peak EMG activity and standard erros during contractions. Average force measured: Adductors; 59N, Gluteal; 76N, Abductors; 67N, Rectus; 85N, Transversus; 83N. All peaks were significantly higher than rest and lower than MVC,*except the Abductors for MVC.

REFERENCES

1. Keshwani N, McLean L. A differential suction electrode for recording electromyographic activity from the pelvic floor muscles: crosstalk evaluation. J Electromyogr Kinesiol. 2013;23(2):311-8.
2. Flury N, Koenig I, Radlinger L. Crosstalk considerations in studies evaluating pelvic floor muscles using surface electromyography in women: a scoping review. Archives of gynecology and obstetrics. 2017;295(4):799-809.
3. Voorham-van der Zalm PJ, Voorham JC, van den Bos TW, Ouwerkerk TJ, Putter H, Wasser MN, et al. Reliability and differentiation of pelvic floor muscle electromyography measurements in healthy volunteers using a new device: The multiple array probe leiden (MAPLe). Neurourol Urodyn 2012 Sep 12.

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PSYCHOSOCIAL FACTORS INFLUENCING PHYSIOTHERAPEUTIC ADHERENCE TO GROUP-BASED OR INDIVIDUALIZED PELVIC FLOOR REHABILITATION: PERCEPTIONS OF OLDER WOMEN WITH URINARY INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

Since adherence is a key predictor of the success of pelvic floor muscle (PFM) training, many attempts have been made to explain and enhance adherence. However, applying behavioral change theories in a particular exercise setting requires context-specific knowledge and an understanding of the patient's experience [1]. While many older adults with urinary incontinence (UI) undertake PFM training, little is known about their experience in doing so individually or as a group. This study aims to describe the phenomenon of therapeutic adherence to a 12-week PFM training program for the treatment of UI, based on women's perceptions of individual physiotherapy or group physiotherapy.

STUDY DESIGN, MATERIALS AND METHODS

Women aged 60 years and over who had participated in a non-inferiority RCT comparing individual and group physiotherapy for stress and mixed UI were asked to be interviewed after their treatments. Both treatments consisted of a 12-week physiotherapy program including a weekly one-hour PFM training session with an experienced physiotherapist and daily home-based progressive PFM exercises. Each PFM training session comprised 10 minutes of education on UI, 30 minutes of PFM training in different static positions and 20 minutes of functional PFM training. The individual intervention consisted of one-on-one sessions between the participant and the physiotherapist, while group intervention consisted of sessions with eight participants supervised by the physiotherapist.

June 2016 to August 2017, 12 participants consented to face-to-face interviews that were facilitated by a semi-structured interview guide. Of these, half completed the individual physiotherapy program and half the group-based physiotherapy program. The interview questions were related to UI stigmatization, but the phenomenon of therapeutic adherence also emerged during the interview session. The interview data was audio-recorded and transcribed. Transcripts were then organized with ATLAS.ti software and analyzed using the interpretive phenomenological analysis method. To enhance our understanding of the data, two meetings were conducted with two experts in qualitative research, one expert in PFM rehabilitation research, the interviewer and the first author to discuss and achieve consensus regarding data interpretation.

RESULTS

The women's mean age and standard deviation was as follow: individual treatment = 66.8±6.6 years and group treatment = 69.7±6.2 years. In both intervention groups, 4/6 women had lived with UI for two to five years and 2/6 for seven years or more. Their ICIQ-UI SF score varied from 9/21 to 16/21 in the individual treatment (mean = 13.0±2.3) and from 7/21 to 18/21 in the group treatment (mean = 12.3±4.9) which is indicative of moderate to severe symptoms. On the Geriatric Self-Efficacy Index questionnaire, participants in both treatments had similar scores before the intervention (individual treatment = 50.8±28.7 and group treatment = 53.5±31.2), representing moderate level of self-efficacy.

Adherence facilitators that emerged from the data were interpersonal in nature. Two main themes arose from the women's perceptions of adherence: (1) physiotherapist's impact and (2) group effect. These themes, each in its own way, appeared to influence a third theme in the data: (3) self-efficacy. In the context of individual treatments, adherence seemed to be influenced mainly by verbal persuasion from the physiotherapist. In the group treatment, sharing difficulties and successes between participants seemed to facilitate therapeutic adherence. Both groups reported improved self-efficacy (i.e., the individual's belief in her own capacity to accomplish a task) related to the physiotherapist or the group interactions, which was also a facilitator for adherence. Figure 1 presents women's perception of adherence.

INTERPRETATION OF RESULTS

Theme 1: In both treatment contexts, physiotherapists were perceived to enhance adherence through particular characteristics such as dynamism, organization and competence. These same attributes are found to be adherence facilitators, in the literature [1]. Specific to the individual treatments, the women also reported that "forming a team" with the physiotherapist was an additional facilitator to adherence. This concept called "therapeutic alliance" provides the patient with the feeling of working in tandem with the therapist in a shared effort against the patient's distress [2].

Theme 2 is related to the feeling of association between each woman taking part in a group treatment. Their opportunity

to share their weaknesses with other women in the group seemed to induce positive feelings about PFM training instead of self-blame, which appears to enhance adherence. To exercise with women who have the same pathology also appeared to improve self-image, in some women. Moreover, seeing benefits and difficulties of their peers, enhanced the women's desire to be part of the treatment and motivated them to adhere.

Theme 3: Depending on the treatment context, the physiotherapist or the group were perceived as a source of self-efficacy enhancement for the women. In the individual treatment, women reported improved self-efficacy after receiving specific encouragement from the physiotherapist. In fact, the physiotherapist in this context could produce "verbal persuasion" and make the person believe in her own ability to perform the exercises. In the group treatment, women reported witnessing difficulties and successes among the other women of the group and this led to a higher adherence. This finding aligns well with Bandura's Social Learning theory and "vicarious experience" [3]. Self-efficacy is very important in this type of program since women who initiate a PFM training report feeling relatively disempowered [1]. Improved self-efficacy is known to be closely related to greater long-term adherence to PFM training [1].

CONCLUDING MESSAGE

Our findings contribute to a better understanding of older women's experience and perception of adherence to a PFM training program for urinary incontinence. While both groups demonstrated improved self-efficacy, positively influencing their adherence, this was due to different facilitators in their treatment context. Additional studies are needed to further explore these underlying facilitators.

FIGURE 1

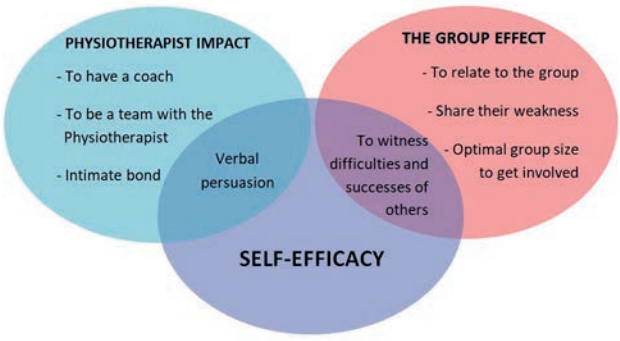

Figure 1. Women's perception of adherence.

REFERENCES

1. Dumoulin, C., Hay-Smith, J., Frawley, H., McClurg, D., Alewijnse, D., Bo, K., ... & Hagen, S. (2015). 2014 consensus statement on improving pelvic floor muscle training adherence: International Continence Society 2011 State-of-the-Science Seminar. Neurourology and urodynamics, 34(7), 600-605.
2. Ackerman SJ, Hilsenroth MJ. A review of therapist characteristics and techniques positively impacting the therapeutic alliance. Clin Psychol Rev. 2003 2003/02/01/;23(1):1-33.
3. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. Psychol Rev. 1977;84(2):191-215.

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MOTOR UNIT RECRUITMENT BEHAVIOR OF CONTINENT AND INCONTINENT WOMEN'S PELVIC FLOOR MUSCLES WHILE RUNNING: A WAVELET APPROACH

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HYPOTHESIS / AIMS OF STUDY

High impact activities such as running require involuntary, reflexive pelvic floor muscle (PFM) contractions to avoid urinary leakage. Structural and histochemical characteristics showed that the levator ani muscle is composed of 54.9-70.3% slow type I and 29.7-45.1% fast type II fibers in healthy women. The predominance of type I fibers suggests that the levator ani muscle is suited to maintain pelvic floor organs in an optimal position. However, the high proportion of the fast type II fibers refers also to rapid PFM contractions. Additionally, a significantly smaller diameter of the levator ani muscle fibers was found and the percentage of type II fibers was decreased in women with stress urinay incontinence (SUI) [1]. Therefore, SUI is structurally and histochemically related to the proportion of type I and type II fibers. However, the knowledge about fiber recruitment behavior of PFM during high impact sport activities is still inadequate. It was shown that continent women produce faster, however, voluntary contractions than incontinent women. While running, a rapid increase to maximum PFM electromyography (EMG) activity within the first milliseconds after heel strike was observed in young continent women.

Wavelet analysis of EMG signals allows to extract EMG frequencies among time with fine time resolution. Therefore, task-specific muscular activation in terms of frequency and magnitude during short time periods, like for example the pre-initial contact phase of the gait cycle, can be extracted with wavelets. During such a muscular event, muscle fiber groups can selectively be activated. These groups generate a specific EMG spectrum [2]. EMG spectra are associated with

the conduction velocity of the motor unit action potential. Hence, fiber type recruitment can be estimated with wavelets since slow type I fibers generate lower frequencies in the signal and fast type II fibers higher frequencies. In this study it was hypothesized that different PFM fiber types are activated in the pre- and post initial contact phase during running. The aim of the study was to illustrate spectral changes of the pre- and post-initial contact phase during running at three different speeds and to compare continent and incontinent women with a wavelet approach.

STUDY DESIGN, MATERIALS AND METHODS

This cross-sectional study included 28 continent (CON) women, age: mean 38.9 (SD:10.3) years, Oxford grading [scale: 0-5]: median 5 (IQR:1) and ICIQ UI-sf [questionnaire to screen level and impact of incontinence; scale: 0-21]: median 0 (IQR:0) and 21 women with SUI, age: mean 46.1(SD:9.9) years, Oxford grading: median 5(IQR:1), ICIQ UI-sf: median 6 (IQR:2) and self-reported SUI. PFM EMG was recorded during 10 s at 7, 11 and 15 km/h treadmill running. The raw EMG signals were 20 Hz high-pass and 500 Hz low-pass filtered. PFM EMG was analyzed with a continuous wavelet transform using Morse wavelets. Wavelet patterns were normalized to the total power (100% = sum of all intensities) of the signal within the frequency band 20-500 Hz. The relative distribution of power (%) over the six selected frequency bands of interest (Table 1) were extracted within six time intervals of 30 ms, from -30 ms before to 150 ms after initial contact [3], (Figure 1). The frequency band between 0 and 20 Hz was not analyzed due to possible movement artifacts. An analysis of variance for repeated measures was performed to identify power spectra differences within and between the two groups. Additionally, a post-hoc t-test was used. The significance level was set at $p \leq 0.05$.

RESULTS

Group differences:

The power spectra of each time interval showed no statistically significant group differences. Nevertheless, wavelet patterns of women with SUI showed a systematic trend towards more intensity in the frequency band between 20 and 50 Hz but less intensity between 80 and 200 Hz than continent women.

Pre- and post-initial contact spectral differences:

EMG intensity was significantly lower in the 20-50 Hz frequency band before initial contact than in the post-initial contact phase for all running speeds (group CON) and also for 7 and 11 km/h in group SUI. Group SUI showed no difference in this frequency band between the pre-initial contact phase and the first 60 ms after initial contact during running at 15 km/h. However, running at 15 km/h showed significantly higher intensities before initial contact in the 20-50 Hz frequency band than 60 to 150 ms after initial contact. Group CON: Intensities between 110 and 200 Hz were higher before initial contact for all running speeds. Group SUI: During running at 7 km/h there was more intensity before initial contact than 60-120 ms after initial-contact (110-200 Hz). At 11 km/h more intensity was found before initial contact than 0-150 ms after initial contact (80-200 Hz). During running at 15 km/h higher intensities were found in the pre-initial contact phase than 60-120 ms after initial contact (140-200 Hz), and furthermore, significantly higher intensities were found between 0 and 30 ms than between 30 and 150 ms after initial contact (110-140 Hz).

INTERPRETATION OF RESULTS

Group differences:

Although there was no significant group difference, a trend towards lower frequencies in women with SUI was found. Women with SUI have been demonstrated to present relatively less intensity in high frequency bands and more in the lower frequencies. These findings could be related to the structurally and histochemically change of the proportion of type I and type II fibers in women with SUI. Therefore, a possible explanation could be a selective atrophy of type II muscle fibers, as previously investigated in a histological study [1]. However, the histological study included only a small sample. In this study, group SUI had a low ICIQ UIsf score and did not differ from group CON in terms of the Oxford grade. This might be an explanation that no significant group differences were found.

Pre- and post-initial contact spectral differences:

The evaluated specific differences of EMG spectra in the pre-initial and the post-initial contact phase seem to indicate two different muscle activation events. Power spectra shifts towards higher frequency bands in the pre-initial contact phase could indicate a feed-forward anticipation and a muscle tuning for the expected impact of initial contact event in order to maintain continence. However, higher intensities in high frequencies during preparation and adaptation were more consistently in continent women than in women with SUI. Especially when running at 15 km/h, highest intensity production of the frequency band between 110 and 140 Hz was in the time window from initial contact to 30 ms after initial contact (group SUI). These findings could refer to a delayed PFM activation and could indicate an inconsistency in muscle preparation.

CONCLUDING MESSAGE

Since running is an activity of daily life, the often-related urinary leakage can cause a reduction in the quality of life of many women. Therefore, a deeper insight into continence mechanisms while running is needed. In this study, differences of pre- and post-initial contact activation behavior of PFM during different running speeds as well as spectral changes towards high or low frequencies could be extracted with wavelets. The potential of wavelet analyses in the field of PFM research should be used in further studies.

FIGURE 1

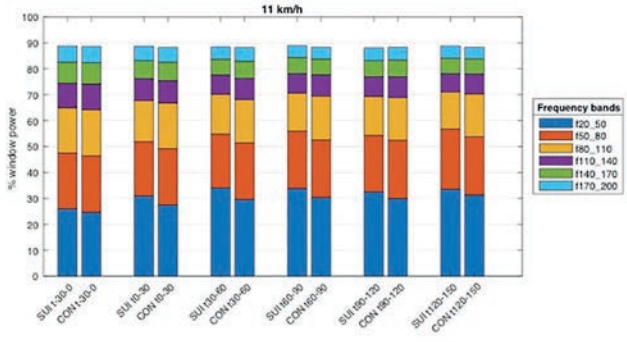

Figure 1: Distribution (%) of total intensity within the frequency bands during running at 11 km/h.
% window power: Relative distribution of power (%) over the six selected frequency bands of interest (total power = 100%)
SUI: Group of women with SUI
CON: Group of continent women
t-30-0 ms, t0-30, t30-60, t60-90, t90-120, 120-150: Time intervals of 30 ms in accordance with Fleischmann [1]

FIGURE 2

Table 1: Wavelet parameters

Frequency bands (Hz)	20-50	50-80	80-110	110-140	140-170	170-200

REFERENCES

1. Zhu (2005), Int Urogynecol J
2. von Tscharner (2006), J Electromyogr Kinesiol
3. Fleischmann et al. (2011), Appl Physiol

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** The study was approved by the ethics committee of the Canton of Bern, Switzerland (No 391/14) **Helsinki** Yes **Informed Consent** Yes

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PELVIC FLOOR MUSCLES REST-ACTIVITY AND HOLD CONTRACTION IN DIABETIC PREGNANT WOMEN DURING PREGNANCY: COHORT STUDY

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HYPOTHESIS / AIMS OF STUDY

Pelvic floor muscles rest-activity and hold contraction are important once these muscles are involved in postural stability, in maintenance intra-abdominal pressure, and on mechanical support for pelvic organ. Pregnancy is associated with a progressive rise in intra-abdominal pressure due to fetal and placental weight, and amniotic fluid volume. GDM pregnancies complicated by fetal macrosomia, large placenta and polyhydramnios contribute for abrupt and intense increase in maternal intra-abdominal pressure.This is the first study to investigate disturbs in neuromuscular behaviour of PFM muscle and DMG. Therefore the aim of this study was to investigate and compare EMG activity in hold contraction of PFM in GDM women at 24–30 to 36–40 weeks of gestation.

STUDY DESIGN, MATERIALS AND METHODS

Prospective cohort study conducted between 2015 and 2016 was approved by the Research Ethics Committee of the Institution (Protocol Number 972.104). After the knowledge of all procedures a written informed consent was obtained from all subjects. Helsinki Declaration on human experimentation guidelines was respected.

Inclusion Criteria: nulliparous or primiparous women who had undergone 1 previous elective Cesarean delivery between 24-30 weeks of gestation, singleton pregnancy and 18–40 years of age divided in two groups: GDM and normoglycemic according to ADA 2015. The exclusion criteria were clinical diabetes (type I or II or overt diabetes in previous pregnancy), urinary incontinence, >2 pregnancies, previous urinary incontinence, previous prolapse or incontinence surgery, no understanding of the command to contract PFM, neurological diseases, diagnosis of genital prolapse, cervical isthmus incompetence, smoking, dropouts, preterm birth and abortion.

Sample size was obtained by a pilot study. Determining a sample effect of 0.846, two-sided α of 0.05, and a power of 80%, 23 pregnant women in each group to detect differences were required.

Personal, clinical, Obstetric and anthropometric data was collected. After, Vaginal palpation was performed by encouraging the women to perform a maximal voluntary contraction and hold it for 10 seconds, simulating the steps of the EMG test performed later. If the examiner felt an inward pressure and/or upward traction in palpation the electromyography protocol was performed.

For the EMG recordings, part of Glazer protocol was used to verify muscle activity during rest and hold contractions. The sequence consisted of 60 second preliminary followed by five repetitions of 10 second contractions, each contraction preceded by a 10 second rest period, were defined as hold contraction.(1)

The raw signal was processed by using MiotecSuite software by an examiner blinded to the women's clinical data. The electrical data of the recruitment root mean square (RMS) from the period of five hold contractions were performed by using Hanning window processing, after calculation of each RMS arithmetic mean was performed to determine a mean single value for each contraction type. To normalize the EMG recruitment signal, we used the maximal voluntary contraction at 24–30 weeks of gestation because that was considered base data for analysis of changes in PFM activity.

RESULTS

Maternal age, gestational ages at two points, BMI, cesarean delivery were pared between groups. Concerning the glucose tolerance test as expected the values were different between groups. Table 1 show Analysis Intragroup of Normalized Root Mean Square (RMS) Values From Electromyography Activity of Pelvic Floor Muscles in Rest and Hold Contraction of the Normoglycemic (NG) and Gestational Diabetes Mellitus (GDM) at 24–30 and 36–40 weeks of gestation.

INTERPRETATION OF RESULTS

The normalized RMS values of PFM activity shown in Table 1 demonstrated the influence of GDM on pelvic floor activity. GDM group decreases PFM rest-activity and hold contraction between two points. The results showed that GDM decreases PFM activity at hold contraction instead NG group maintain the PFM activity. The PFM is responsible for maintaining resting maximal urethral closure pressure, and when the ability to contract PFM is impaired, the maximal urethral closure pressure decrease by 70%–80%, which can lead to PFMD.22 Decreased PFM activity in GDM could predispose pregnant women to develop of PFMD, which is consistent with our clinical study showing higher urinary incontinence and PFMD in previous GDM. These findings and the homogeneity of our data may suggest that GDM were responsible for changes on PFM activity detected by EMG. (2)

CONCLUDING MESSAGE

Knowledge of the neuromotor behavior of PFM is of paramount importance for the training and reorganization of motor planning in pregnancy.(3) This investigation contributes to the understanding of EMG activity in GDM women at two time points of gestation.

FIGURE 1

Table 1. Analysis Intragroup of Normalized Root Mean Square (RMS) Values From Electromyography Activity of Pelvic Floor Muscles in Rest and Hold Contraction of the Normoglycemic (NG) and Gestational Diabetes Mellitus (GDM) at 24–30 and 36–40 weeks of gestation.

		24-30 Weeks of Gestation Median (Min,Max)	36-40 Weeks of Gestation Median (Min,Max)	P*
Rest Activity	GDM (26)	0.24 (0.10,–0.84)	0.19 (0.02,0.93)	.041
	Control (26)	0.23 (0.04,0.89)	0.29 (0.05,1.66)	.104
Hold Contraction	GDM (26)	0.57 (0.14,5.85)	0.41 (0.12,5.42)	.049
	Control (26)	0.70 (0.07,2.16)	0.70 (0.1,3.10)	.571

Data are the median (minimum, maximum) range
* Analyses intragroup from 24-30 to 36-40 weeks of gestation based on Wilcoxon Test;

Funding #2016/01743-5 , São Paulo Research Foundation (FAPESP)/ Brazil. **Clinical Trial** No **Subjects** Human **Ethics Committee** Research **Ethics Committee** of Botucatu Medical School - UNESP (CAAE 40418215.8.0000.5411). **Helsinki** Yes **Informed Consent** Yes

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A PROSPECTIVE, MULTICENTER, INTERNATIONAL CLINICAL TRIAL TO ASSESS THE EFFICACY AND SAFETY OF A NOVEL WIRELESS IMPLANTABLE TIBIAL NERVE STIMULATOR FOR THE TREATMENT OF PATIENTS WITH REFRACTORY OVERACTIVE BLADDER (OAB): 3-YEARS RESULTS

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HYPOTHESIS / AIMS OF STUDY

To determine the long term safety and performance of a novel implantable tibial neurostimulation device (the BlueWind Medical RENOVA iStimTM System) for the treatment of OAB.

STUDY DESIGN, MATERIALS AND METHODS

A wireless peripheral neurostimulator device (BlueWind Medical Ltd.) was implanted on the posterior tibial nerve approximately 5 cm above the medial malleolus and 2 cm posterior to the tibia in patients with refractory OAB. Local anaesthesia was used unless general anaesthesia was clinically indicated. The implant that electrically stimulates the tibial nerve is wirelessly powered by an external control unit (ECU). The ECU controls the therapeutic parameters and is worn by the patient during a specified treatment period whilst at home. A Physician Programmer is also used to remotely set individual stimulation parameters for each patient to optimize therapeutic outcome.

Refractory OAB patients with symptoms of urinary frequency greater than 8 times/24 hours and/or urinary urgency leaks of at least 2 leaks/24 hours (both male and female) were enrolled, while those with clinically predominant stress urinary incontinence or those suffering from any neurological disease or disorder were excluded The efficacy and safety of BlueWind Medical RENOVA iStimTM system were assessed using a 3 day frequency volume chart, quality of life questionnaire (OAB-q) as well as clinical examination for up to 36-months post activation. The McNemar's test for paired proportions was applied to compare to the clinical improvement (i.e. ≥50% improvement in either number of urge-related incontinence episodes or number of urgent voids) at 6-months with that of longer follow-up periods.

RESULTS

A total of 36 patients were recruited for the original pilot study and were followed for 6 months post activation of the device. All 36 patients were implanted successfully with mean procedure duration of 34.8 minutes. These results have been previously reported.

Twenty-three OAB RENOVA iStim system implanted subjects were re-enrolled for the extended, 3-year follow-up study. Up to date, 11 patients have reached 30-months follow-up. No SAEs were reported during the extended follow-up. In the per-protocol analysis, 9 of the 11 patients (82%) have shown more than 50% improvement in either number of urge-related incontinence episodes or number of urgent voids as compared to baseline. In the intent-to-treat analysis, 18 out of the 23 patients have shown above 50% improvement (78%).

By August 2018, all of the patients are expected to reach their 36-month follow-up visit and final results will be presented.

INTERPRETATION OF RESULTS

BlueWind Medical RENOVA iStim system demonstrates long term safety and efficacy. When comparing the results of the long term follow-up to the 6-months follow-up, responders' rates were similar at 6- and 30-months follow-up periods (74% and 78%, respectively).

CONCLUDING MESSAGE

The BlueWind Medical RENOVA iStim System for the treatment of OAB demonstrates safety as well as sustainable successful efficacy long-term results. A larger multicentre, international study is planned to confirm these promising preliminary data.

Funding This Trial was funded by BlueWind Medical Ltd **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov Identifier: NCT02299544 **RCT** No **Subjects** Human **Ethics Committee** Imperial College London **Helsinki** Yes **Informed Consent** Yes

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ONE-YEAR OUTCOMES OF THE TREATMENT OF OVERACTIVE BLADDER WITH THE MINIATURIZED, RECHARGEABLE AXONICS R-SNM SYSTEM

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HYPOTHESIS / AIMS OF STUDY

Sacral neuromodulation (SNM) is a guideline-recommended treatment for overactive bladder (OAB) patients after conventional treatments have failed. Historically, the only commercially available SNM System was a primary-cell, non-rechargeable system with a device lifespan of 3-6 years, thus requiring multiple replacement surgeries over a patient's life. Replacement surgeries increase patient surgical risk and healthcare costs. Use of a rechargeable system that has a longer device life-span could significantly reduce or eliminate patient surgical risks and healthcare costs. The Axonics® miniaturized, rechargeable SNM (r-SNMTM) system is designed and tested to last for at-least 15 years and has regulatory approval in Europe, Canada and Australia. The RELAX-OAB study was a post-market clinical follow-up study in Europe designed to test the safety and efficacy of the Axonics r-SNM System. 1-Year follow-up results are presented here.

STUDY DESIGN, MATERIALS AND METHODS

This prospective study treated 51 OAB patients across 7 European centers. Patients were implanted with the Axonics tined lead and IPG in a single procedure using a sacral transforaminal approach to implant the tined lead in proximity of the third or fourth sacral nerve. Voiding diaries (3-day) were completed at baseline and at post-implant follow-up visits. Data on patient quality of life was collected using the ICIQ-OABqol validated questionnaire. Patient reported data on satisfaction with treatment, ease of recharging and acceptability of recharging was also collected. In order to be comparable with the clinical literature for two-stage SNM treatment, the first month post-implant was considered as the "Test" period, and subjects were deemed to be Test Responders or Test Failures based on clinical outcomes at 2-week or 1-month visits. Responders were identified as patients that experienced 50% reduction in voids and/or incontinence episodes compared to baseline or a reduction in voids to less than 8 per day. All subjects were followed through the 1-Year follow-up regardless of their Test period outcome. Data analyzed per-protocol is presented.

RESULTS

A total of 38 females and 13 males with an average age of 51 years old (21-77 years) were implanted with the Axonics r-SNM System. At baseline patients had an average of 14.6 ± 6.1 voids per day and 9.6 ± 5.1 incontinence episodes per day.

34 of 51 (71%) subjects were Test Responders at 1-month post-implant. At 1-Year post-implant, 94% of the Test Responders continued to be therapy responders. Compared to Baseline, voids per day reduced by 6.5 (± 5.9, $p<0.001$, two-sided t-test), and leaks per day reduced by 6.6 in the Test Responders (± 4.1, $p<0.001$, two-sided t-test) (Figure 1).

Figure 1: Bladder diary symptoms in Test Responders at baseline and at 1-year of r-SNM therapy.

Test Responders experienced clinically meaningful improvements in quality of life at 1-Year with average improvement from baseline in the composite Health Related Quality of Life (HRQL) score of 21.1 points (Figure 2). Improvements on all quality of life subscales were statistically significant and clinically significant (above the minimally important difference of 10 points [1]).

Figure 2. ICIQ-OABqol scores at baseline and 1-Year in Test Responders.

84% of the Test Responders were moderately or very satisfied with their r-SNM therapy.

Data on ease of recharging and acceptability of recharging was collected at 1-Year or 18-months. 90% of all implanted subjects responded that it was moderately or very easy to recharge their device and 97% thought the charging frequency and duration was moderately or very acceptable.

No serious device-related adverse events have been reported over 580 months of cumulative patient follow-up. Two patients were explanted, one due to a post-operative wound infection and one due to lack of efficacy. No issues or adverse events were reported related to device recharging.

INTERPRETATION OF RESULTS

The results confirm the 1-Year safety and sustained efficacy of the rechargeable Axonics r-SNM System. A rechargeable SNM system is expected to provide significant cost-effectiveness [2] and long-lived therapeutic benefits compared to existing non-rechargeable systems.

CONCLUDING MESSAGE

Patients implanted with the Axonics r-SNM System have received clinically significant improvements in their symptoms and quality of life at 1-Year post-implant. Patients reported that recharging their r-SNM system is easy and acceptable.

FIGURE 1

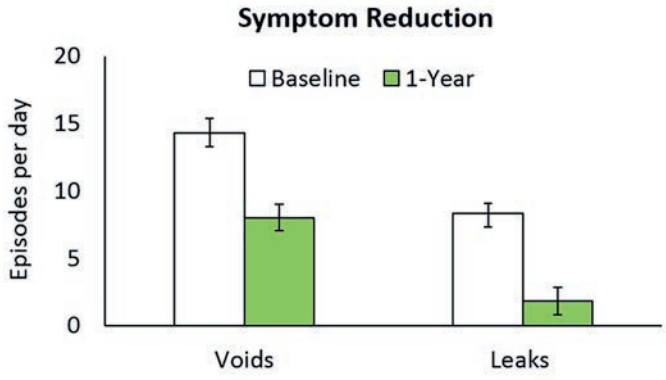
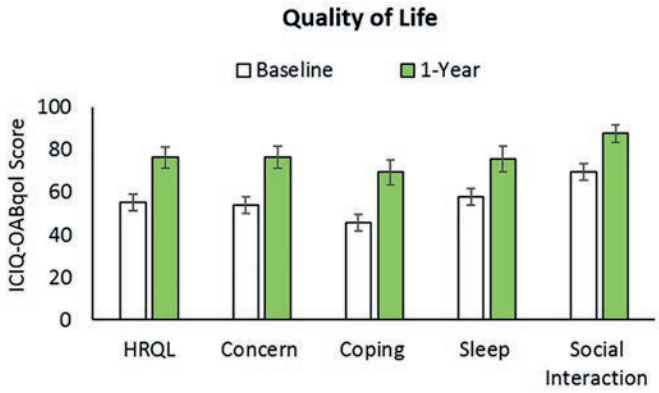


FIGURE 2



REFERENCES

1. Coyne K, Matza L, Thompson C, et al. (2006) Determining the importance of change in the overactive bladder questionnaire. J Urol 176: 627-32
2. Noblett K, Dmochowski R, Vasavada S, et al. (2017) Cost profiles and budget impact of rechargeable versus non-rechargeable sacral neuromodulation devices in the treatment of overactive bladder syndrome. Neurourol Urodyn 36: 727- 33

Funding Axonics Modulation Technologies, Inc **Clinical Trial** No **Subjects** Human **Ethics Committee** University College London Hospital & National Hospital for Neurology & Neurosurgery Ethical Committee; approval was obtained subsequently from the ethical committees in all participating hospitals **Helsinki** Yes **Informed Consent** Yes

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HOW TO CONTROL SACRAL NEUROMODULATION IN PATIENTS WITH SACRAL DEFICIENCY OR PARTIAL SACRAL DEFECT 3D PRINTING TECHNOLOGY IS APPLIED (7 CASES REPORT)

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HYPOTHESIS / AIMS OF STUDY

We report a new percutaneous navigation technology that can be used for sacral neuromodulation in patients with sacral deficiency or sacral defect. The operative technique is simple and can increase the effective rate of sacral neuromodulation

STUDY DESIGN, MATERIALS AND METHODS

preoperative localization of the sacrum CT and sacral nerve MRI scan were performed on the subjects. The CT and MRI data were fused and three-dimensional formed. On the 3D model, the percutaneous needle path was designed according to the sacral nerve, and the puncture navigation template was designed according to the positioning patch. The

optimal side nerve implant electrode was selected according to the puncture navigation template in the operation.

RESULTS

of the seven patients receiving 3D printing, three males and four females, age 26 + 13.51 years, two sacral absence and five sacral defect, bilateral sacral 2 nerve to sacral 4 nerve partial deletion, three cases of right nerve and four left nerve in phase I test, and two cases implanted sacral 2 nerve, four cases implanted sacral 3 nerve, one case implanted sacral nerve. In the final test, the symptoms of urination were improved in four patients, and the II permanent electrodes were implanted. oen patient were not tested, one patient improved less than 50%, no II permanent electrodes were implanted, and one patient was still effective in the I phase test. The total effective rate was 66.67%.

INTERPRETATION OF RESULTS

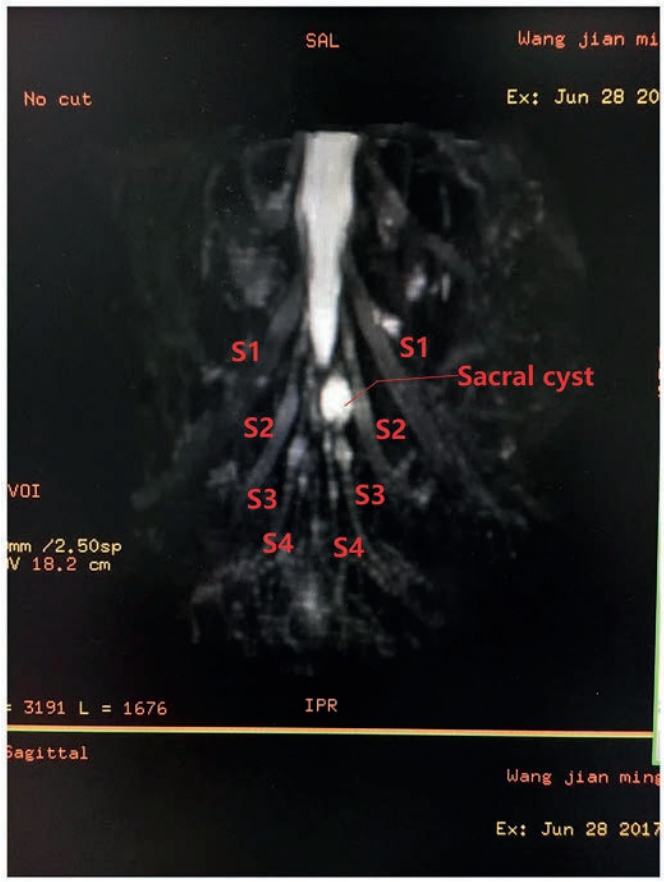
3D printing technology can make sacral nerve defects and sacral nerve defects benefit from sacral neuromodulation, improve urination symptoms and improve quality of life.

CONCLUDING MESSAGE

3D printing technology can make sacral nerve defects and sacral nerve defects benefit from sacral neuromodulation, improve urination symptoms and improve quality of life. This technology has also broken the way of puncturing the sacral neuromodulation, which is of great significance for the improvement of the operation.

FIGURE 1

FIGURE 2



Funding No **Clinical Trial** Yes **Registration Number** Chinese Clinical TRial Registry,ChiCTR-INR-16009362 **RCT** Yes **Subjects** Human **Ethics Committee** Renji Hospital affiliated to Shanghai Jiao Tong Unitversity School of Medicine **Helsinki** Yes **Informed Consent** Yes

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IMPROVEMENTS IN OVER ACTIVE BLADDER SYMPTOMS IN PATIENTS USING FUNCTIONAL ELECTRICAL STIMULATION (FES) OF THE COMMON PERONEAL NERVE

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HYPOTHESIS / AIMS OF STUDY

Functional electrical stimulation (FES) is a highly effective treatment for the management of foot drop in patients with central neurological disorders such as Multiple sclerosis (MS) and stroke, and consists of intermittent electrical stimulation of the common peroneal nerve (CPN). Percutaneous electrical stimulation of the tibial nerve (PTNS), which shares

a common innervation with the CPN, is associated with improvements in overactive bladder (OAB) symptoms, and it is therefore possible that CPN stimulation can influence LUT symptoms. Anecdotally, some patients have reported improvements in lower urinary tract (LUT) symptoms after commencing FES, however this has never been systematically evaluated in the literature. The purpose of this study was to therefore explore changes in OAB symptoms in a group of patients undergoing FES of the CPN.

STUDY DESIGN, MATERIALS AND METHODS

Consecutive patients attending a dedicated FES unit at a tertiary level teaching hospital over six months in 2016-2017 were enrolled in a prospective exploratory assessment of LUT functions. A validated questionanire, the ICIQ-OAB, was adminstered at baseline and 3 months during their routine physiotherapy appointments, alongside conventional measures of walking speeds over 10 metres, and an 11 point Visual Analogue Scale (VAS) of satisfaction with walking, where 0 is extremely dissatisfied and 10 is extremely satisfied. Patients used the Odstock Dropped Foot Stimulator (ODFS®) Pace device, a single channel, foot switch triggered, stimulator designed to elicit dorsiflexion and eversion of the foot by stimulation of the common peroneal nerve (maximum amplitude 100mA, 350 s pulse, 40Hz). Skin electrodes are typically placed over the common peroneal nerve as it courses around the head of the fibula and over the motor point of tibialis anterior and the device is used when the patient requires to ambulate. The service evaluation was reviewed and registered with the Quality and Clinical Governance Department. Data was analysed using SPSS; the Wilcoxon Signed-Rank Test was used to compare walking speeds and ICIQ-OAB scores at baseline and 3 months and Spearman's Rank Correlation Coefficient to assess the relationship between baseline walking speed and A scores with change in the ICIQ-OAB score.

RESULTS

Analysis revealed a significant improvement in walking speed at 3 months both in the whole cohort ($p<0.001$) and in the MS cohort ($p=0.001$). Additionally, satisfaction of gait improved significantly in all groups ($p<0.001$) (Table). There was a significant improvement of the ICIQ-OAB scores in the MS population over the 3 month period ($p=0.043$). When individual LUT symptoms were separately analysed, significant improvements were seen in urinary urgency and urinary urge incontinence ($p< 0.05$). There were no significant side effects reported. There was a significant negative correlation of moderate strength within the MS cohort between baseline walking speed and the subsequent change in ICIQ-OAB score (correlation coefficient $r=-0.40$, $p=0.046$), ie. greater improvments in OAB symptoms were seen in patients with lower baseline walking speeds. A significant negative correlation of moderate strength was shown between baseline ICIQ-OAB score and change in ICIQ-OAB score in the whole cohort and within MS patients; Ie. those with worse OAB symptoms at baseline showed smaller improvements in OAB symptoms (whole group $r=-0.466$, $p=0.001$; MS group $r=0.442$, $p=0.008$).

INTERPRETATION OF RESULTS

The results of this prospective observational study suggest that electrical stimulation of the CPN, results in significant improvements of OAB scores after 3 months of stimulation in patients with MS. Moreover, the one unit reduction in ICIQ-OAB score represents a clinically important difference which is recognized to constitute evidence for clinicians and patients to continue treatment [1]. Improvements in incontinence could reflect changes in mobility and walking speed when accessing toileting facilities, however additionally the urinary urgency score improved and therefore the results of this preliminary study suggest a direct improvement on the OAB. Studies have demonstrated the efficacy and safety of PTNS for MS-related OAB symptoms [2], and therefore a larger study is required to confirm the findings of this preliminary study exploring CPN stimulation. Moreover, urodynamic testing should be included to explore whether improvements in LUT symptoms following CPN stimulation are associated with objective changes in LUT dysfunction such as detrusor overactivity.

CONCLUDING MESSAGE

The results of this exploratory study suggest that FES of the common peroneal nerve, a commonly used neurostimulation treatment for managing foot drop, may result in improvements in OAB symptoms in neurological patients.

FIGURE 1

	All patients	MS	Non- MS
Number	47	35	12
Age(yrs); mean (range)	51 (32-70)	52 (37-70)	49 (32-66)
Walking speed at baseline (m/s);	(44 total) Mean (SD)0.68 (0.28) Median (IQR) 0.63 (0.50-0.82)	(34 in total) Mean (SD) 0.69 (0.30) Median (IQR) 0.67 (0.49-0.85)	(10 in total) Mean (SD) 0.64 (0.20) Median (IQR) 0.61 (0.46-0.79)
Walking speed at 3 months with FES	(41 total) Mean (SD)0.79 (0.32) Median (IQR) 0.80 (0.51-1.00)*	(31 in total) Mean (SD) 0.81 (0.32) Median (IQR) 0.82 (0.52-1.00)*	(10 in total) Mean (SD) 0.70 (0.30) Median (IQR) 0.65 (0.50-1.00)
VAS of walking satisfaction at baseline	Mean (SD) 3.04 (2.05) Median (IQR) 3.00 (2.00-4.75)	Mean (SD) 3.24 (2.19) Median (IQR) 3.00 (2.00-5.00)	Mean (SD) 2.67 (1.61) Median (IQR) 2.00 (2.00-4.50)
ICIQ-OAB score Baseline Mean (SD)	6.00 (3.28)	6.00 (5.00)	3.42 (1.73)
ICIQ-OAB score 3 months Mean (SD)	5.60 (2.92)	5.00 (5.00)*	4.08 (2.39)

*p< 0.05

REFERENCES

1. Verghese T S, Tryposkiadis K, Arifeen K, Middleton L, Lathe P M. Minimal clinically important difference (MCID) for the international Consultation on Incontinence Questionnaire- Overactive Bladder (ICIQ- OAB). Abstract 638, ICS Florence 2017 https://www.ics.org/Abstracts/Publish/349/000638.pdf
2. Canbaz Kabay S, Kabay S, Mestan E, Cetiner M, Ayas S, Sevim M, Ozden H, Karaman HO. Long term sustained therapeutic effects of percutaneous posterior tibial nerve stimulation treatment of neurogenic overactive bladder in multiple sclerosis patients: 12-months results. Neurourol Urodyn. 2017 Jan;36(1):104-110.

Funding No funding or grant **Clinical Trial** No **Subjects** Human **Ethics Committee** University Collage of London

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LONG-TERM NEUROSTIMULATOR PROGRAMMING IN A LARGE PROSPECTIVE TRIAL OF SACRAL NEUROMODULATION THERAPY FOR OVERACTIVE BLADDER PATIENTS

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HYPOTHESIS / AIMS OF STUDY

The InSite trial was a prospective, multicenter post-approval study in subjects receiving sacral neuromodulation (SNM) therapy with the InterStim® System. Enrolled subjects had bothersome symptoms of overactive bladder (OAB) including urinary urge incontinence (UI) or urgency-frequency (UF). Limited information is available in literature about programming settings for subjects with OAB who receive SNM. This analysis evaluated neurostimulator programming over long-term follow-up and reports patient programming at implant, 1-year, 3-years and 5-years.

STUDY DESIGN, MATERIALS AND METHODS

Subjects with successful test stimulation received an SNM implant. Neurostimulator programming throughout the duration of the trial was at physician discretion and this abstract reports programming parameters collected at the discharge of each visit from the time of full system implant through the 5 year follow-up for implanted subjects. Subjects who reached each visit and had programming data available at the visit were included in the analysis.

RESULTS

Of the 340 enrolled subjects that completed test stimulation, 272 were implanted with InterStim. Mean age was 57 years and 91% were female. At baseline, UI subjects had 3.1±2.7 leaks/day; UF subjects had 12.6±4.5 voids/day. For those subjects who reported programming data at the visit, 36% (95/266) had the cycling feature turned on at implant; and 38% (89/236), 35% (64/183) and 30% (42/140) subjects had the cycling on at 1-year, 3-years and 5-years respectively. Table 1 describes programming parameters for amplitude, pulse width, and rate for the selected electrode configuration at implant and follow-up visits at 1 year, 3 years and 5 years. For amplitude, the median was 1.2v at implant and increased to 1.7v at 5 years. The majority of subjects changed amplitude from baseline to follow-up visits although the changes were minimal: 62.7%, 63.3%, 66.2% of subjects had their amplitude changed from baseline within 1v at the 1-year, 3-year, 5-year visit, respectively. Median for pulse width was 210µsec at implant and through follow-up visits; median for rate was 14 hz at implant and through follow-up visits.

INTERPRETATION OF RESULTS

The majority of subjects in the trial had therapeutic success and median thresholds that remained under two volts during the entire 5 years of observation. Use of cycling was limited to about a third of all patients.

CONCLUDING MESSAGE

Data from this large study that is representative of a real-world patient population suggest that programming settings remain largely consistent from implant to 5 years post-implant.

FIGURE 1

Table 1: Programming parameters over time

Programming parameters	N*	Mean	Standard deviation	Median
Implant				
Amplitude, volts	265	1.4	1.0	1.2
Pulse Width, µsec	266	211.1	24.3	210.0
Rate, hz	266	15.2	3.3	14.0
1 Year				
Amplitude, volts	234	2.1	1.4	1.8
Pulse Width, µsec	235	223.0	53.8	210.0
Rate, hz	236	15.2	3.1	14.0
3 Year				
Amplitude, volts	183	2.0	1.2	1.7
Pulse Width, µsec	183	217.4	51.8	210.0
Rate, hz	183	15.1	3.2	14.0
5 Year				
Amplitude, volts	138	1.8	1.2	1.7
Pulse Width, µsec	138	212.6	41.4	210.0
Rate, hz	138	14.8	2.8	14.0

*Implanted subjects with programing data

Funding Medtronic sponsored the clinical study **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov NCT00547378 **RCT** No **Subjects** Human **Ethics Committee** Western IRB and local institution IRB/**Ethics Committees Helsinki** Yes **Informed Consent** Yes

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DOES ELECTRICAL STIMULATION IN THE LOWER URINARY TRACT INDUCE DIURESIS?

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HYPOTHESIS / AIMS OF STUDY

Electrical stimulation of the lower urinary tract (LUT) is typically used to assess current perception thresholds and sensory evoked potentials to investigate LUT afferent function. However, changing bladder volume during measurement may influence the outcome. We therefore aimed to quantify urine production during LUT electrical stimulation using different stimulation frequencies. We hypothesized that electrical stimulation of the LUT would increase urine production per time compared to baseline values. Assuming location-specific innervations in the LUT, urine production per time was expected to be higher during electrical stimulation at the trigone compared to the other locations [1]. In addition, mean urine production per time was predicted to be bigger when stimulating with a higher frequency (respectively stimulation intensity) compared to a lower frequency (respectively lower stimulation intensity).

STUDY DESIGN, MATERIALS AND METHODS

After local ethics committee approval, 89 healthy controls (mean age: females (n=39): 23.4±3.4 years, males (n=50): 24.3±3.9 years) were considered for the analysis. All of the subjects completed a 3-day bladder diary. LUT stimulation site was randomly assigned: bladder dome (n=20), trigone (n=20), proximal urethra (n=20), membraneous urethra (n=10, males only), and distal urethra (n=19). After catheter placement the bladder was emptied and refilled with 60mL of contrast medium. Current perception threshold assessment followed by electrical stimulation was applied at two separate visits with a 14Ch custom-made catheter using three different frequencies (500 stimuli - stimulation frequency 0.5Hz (~16.7min), 1.1Hz (~7.6min), 1.6Hz (~5.2min)) in random order. After each stimulation session, the bladder was emptied again and volumes were recorded. In order to control for different stimulation times, urine production per time was analyzed. Linear mixed effects modeling was used to estimate the impact of specific variables on bladder volume increase, i.e. urine production per time, during electrical stimulation in the LUT.

RESULTS

The average amount of daily fluid intake was 2287±882mL for females and 2319±1101mL for males. Compared to average natural diuresis over 24 hours as assessed by bladder diary (1.4±0.6mL/min for females and 1.3±0.8mL/min for males), urine production per time increased ($p<0.001$) in average to 11.9±7.5mL/min in females and 9.2±8.2mL/min in males during electrical stimulation. With 0.5Hz stimulation, urine production per time increased by factor 6.5 compared to the bladder diary values, while it increased by factor 11.6 when stimulating with 1.6Hz. Stimulation frequency ($p<0.001$), stimulation order ($p=0.002$), and stimulation intensity ($p=0.021$) had a significant influence on urine production per time and was different between genders ($p=0.024$), while stimulation location and visit had no statistical significant influence.

INTERPRETATION OF RESULTS

The results showed that electrical stimulation in the LUT significantly increased urine production per time with a bigger impact of higher frequencies and stimulation intensities. We think that a greater energy input to the afferent nerves of the lower urinary tract enhances the observed effect. In contrary to our hypothesis, the linear mixed effects model did not reveal a significant effect of stimulation site on urine production per time. We assume that this increase in diuresis is mainly centrally regulated while peripheral innervation plays a minor role.

CONCLUDING MESSAGE

This is the first study in healthy young subjects that investigated a potential relationship between electrical LUT stimulation and urine output. The finding of increased diuresis during LUT electrical stimulation might not only be relevant for methodological aspects in the assessment of LUT afferent function but also for patients with impaired urine output. It is a highly interesting and relevant observation from a physiological but also clinical point of view. Yet, there is no clear concept or knowledge on the functional interrelation of LUT electrical stimulation and urine production in the kidneys. Although the exact mechanism is unknown, we assume involvement of autonomic circuits including the spinal and supraspinal control centres.

REFERENCES

1. Spradling, K., Khoyilar, C., Abedi, G., Okhunov, Z., Wikenheiser, J., Yoon, R., et al. (2015). Redefining the Autonomic Nerve Distribution of the Bladder Using 3-Dimensional Image Reconstruction. J Urol, 194(6), 1661-1667.

Funding Swiss National Science Foundation **Clinical Trial** Yes **Registration Number** NCT02272309 **RCT** No **Subjects** Human **Ethics Committee** KEK Zürich **Helsinki** Yes **Informed Consent** Yes

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LONG TERM OUTCOMES OF SACRAL NEUROMODULATION: A 23-YEAR EXPERIENCE

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HYPOTHESIS / AIMS OF STUDY

Sacral Neuromodulation (SNM) has been found effective for the treatment of ”dry and wet” overactive bladder (OAB), Bladder Pain Syndrome/interstitial cystitis (BPS/IC) and voiding dysfunction (VD). Our department was one of the first

two in Canada that started SNM treatment in 1994. Several studies show the safety and efficacy of SNM at short- and medium- term follow-up [1][2][3]. In this study, we review the long-term outcomes and complications of SNM treatment for any indication.

STUDY DESIGN, MATERIALS AND METHODS

This was a retrospective study of all patients who underwent test phase (peripheral nerve evaluation- PNE and/or 1st stage procedure) and then SNM by a single surgeon from 1994 – 2017. The primary outcome was to assess long-term outcomes of SNM using the global response assessment scale. This included percent improvement in pain, as well as storage lower urinary tract symptoms (urinary frequency, urgency, urge incontinence, and nocturia), and voiding lower urinary tract symptoms (weak stream, hesitancy, intermittency, straining and bladder emptying). Secondary outcomes included number of revisions, reason for revision, complications and rate of device removal.

RESULTS

Total of 434 patients were included with 373 (86%) female and 61 (14%) male patients. All patients underwent Test Phase and 241/435 (55%) patients eventually received a SNM implant. Mean age at time of implant was 49 years. Of the patients that received SNM implant, 118 (49%) had a diagnosis of BPS/IC, 24/241 (10%) with VD, 86/241 (36%) with OAB, and 13/241 (5%) with neurogenic lower urinary tract dysfunction (NLUTD). Mean follow-up time was 5.8 years (1 month–20.5 years). 76/241 (32%) devices were removed due to device failure or complication. 167/241 (69%) patients underwent at least one follow-up surgical revision [Figure 1]. The mean percentage improvement in symptoms on the last follow-up (mean 6.4 years) for patients with successful SNM was 69%. At the end of data collection, 166/241 (69%) devices remained in-situ with ongoing follow-up [Figure 2].

INTERPRETATION OF RESULTS

This retrospective study provides valuable insight due to the long-term follow-up. Moreover, we now have a better understanding of the common complications and rate of these complications that patients experience in the long run. Lastly, a mean improvement of 69% in symptoms highlights the serious consideration that SNM needs to be given by Urologists when looking for options for patients with a variety of different urologic concerns.

CONCLUDING MESSAGE

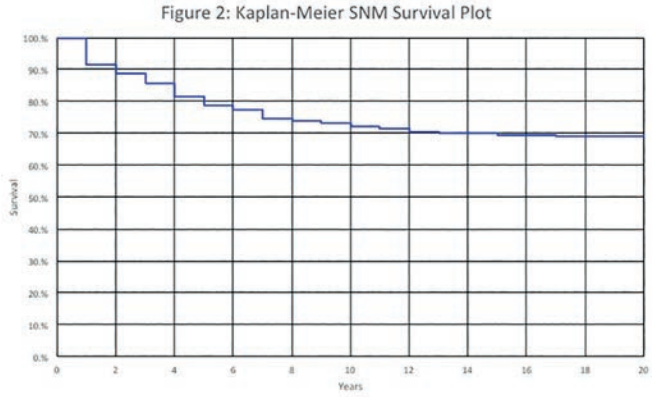
Traditionally patients with OAB, VD and IC, who failed conservative measures were left only with highly invasive options, such as augmentation cystoplasty and urinary diversions. In this chart review, we find that SNM is an effective option prior to major surgical interventions. There is a high revision rate but overall, SNM is a minimally invasive procedure with a good safety profile and excellent long-term outcomes.

FIGURE 1

Figure 1: Re-operations on 241 SNM Implants

Surgery	One	two	three	four	five	six	Total
Total	167	84	35	19	5	2	312
Removal	34	26	10	2	2	2	76
Battery change only	29	16	6	4	1	0	56
Battery & lead change	27	4	1	5	0	0	37
Battery, Lead, extenson	0	12	2	1	0	0	15
Battery or lead reposition	12	6	1	0	1	0	20
Lead change only	44	16	14	7	1	0	82
Lead & Extension cord	18	3	1	0	0	0	22
Extension cord change only	3	1	0	0	0	0	4

FIGURE 2



REFERENCES

1. Marcelissen T, Leong RK, de Bie RA, et al. Long-Term Results of Sacral Neuromodulation with the Tined Lead Procedure. J Urol 2010; 184: 1997-2000.
2. Al-zahrani AA, Elzayat EA, Gajewski JB. Long-term outcome and surgical interventions after sacral neuromodulation implant for lower urinary tract symptoms: 14-year experience at 1 center. J Urol 2011; 185: 981-6.
3. Van Voskuilen AC, Oerlemans DJAJ, Weil EHJ, et al. Long Term Results of Neuromodulation by Sacral Nerve Stimulation for Lower Urinary Tract Symptoms: A Retrospective Single Center Study. Eur Uro 2006; 49: 366-372.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Nova Scotia Health Authority Research Ethics Board **Helsinki** Yes **Informed Consent** Yes

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CAN LUMBOSACRAL MAGNETIC RESONANCE IMAGING BE PERFORMED SAFELY IN PATIENTS WITH A SACRAL NEUROMODULATION DEVICE? AN IN-VIVO PROSPECTIVE STUDY

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HYPOTHESIS / AIMS OF STUDY

To determine the safety of sacral neuromodulation (SNM) in patients during lumbosacral 1.5 Tesla (T) magnetic resonance imaging (MRI).

STUDY DESIGN, MATERIALS AND METHODS

We prospectively recruited InterstimTM II model implanted patients requiring lumbar/spine or pelvis 1.5 T MRI. Patients completed validated questionnaires and a survey regarding their usual SNM sensation pre MRI scan. The implantable pulse generator (IPG) was interrogated and impedances and battery life were assessed pre and post MRI. Patients were monitored during MRI study. An MRI-related adverse events questionnaire was completed post MRI. Validated questionnaires were completed 1 month after the MRI to assess for any changes in SNM therapeutic efficacy. Descriptive statistics were calculated.

RESULTS

Eleven patients were enrolled in the study. All patients underwent lumbar/spine MRI. The most common indication for MRI was lower back pain 55% (6/11). Immediately after the MRI only 1 patient reported discomfort at the site of the IPG during the MRI, however, discomfort was only present during the scan and not afterwards. Two of the patients reported warmth at the site of the IPG during the MRI, again, this sensation was only present during scanning. None of the patients experienced stimulation or movement at the IPG site and no paresthesia was reported. There were no significant changes in impedances and battery life during IPG interrogation post MRI. Threshold amplitudes for sensation and localization of stimulation were unchanged post MRI. Urogenital Distress Inventory (UDI-6) and Incontinence Impact Questionnaires (IIQ-7) 1 month after MRI did not show worsening scores compared to pre MRI scores. None of the patients reported a negative Patient Global Impression of Improvement (PGI-I) score 1 month after MRI.

INTERPRETATION OF RESULTS

In this study, we found that no subjects with implanted SNM devices had any significant adverse events from undergoing 1.5 T lumbar MRI. Additionally, SNM therapeutic efficacy did not change 1 month post-MRI. A main safety concern of SNM with MRI is device heating during scanning due to transmitted radiofrequency power. Utilizing a phantom model, Quirouet et. al. demonstrated the risk of device heating is very low for lumbosacral 1.5 T MRI with an intact SNM system or with a fractured lead [1]. We utilized multiple instruments to measure safety and therapeutic efficacy before and after. SNM devices were switched off before undergoing MRI, patients were periodically interviewed throughout the scan and none terminated the scan due to intolerance. No patients verbalized any sensation of heating during the MRI scan. However, when prompted about symptoms after the scan, 2 patients recalled a warm sensation and 1 patient reported mild discomfort near the IPG during the MRI. Otherwise, following the scan, no patients reported pain or discomfort.

As a number of patients undergo SNM explantation to facilitate MRI, it is important to recognize that many patients explanted do not pursue SNM re-implantation. As shown recently by Lloyd et al., only 10% of explanted patients pursued subsequent re-implantation [2]. Therefore, the results of our study have the potential to improve device management surrounding MRI by establishing evidence of the ability to perform MRI near implanted SNM devices. Furthermore, our findings can translate into improved healthcare efficiency and reduced costs, by, providing a basis for reducing device explants to accommodate MRI, as well as enabling the implantation of devices in appropriate patients who know they may require future MRI studies.

CONCLUDING MESSAGE

No significant adverse events occurred in patients implanted with an InterStimTM II device who underwent 1.5 T non-head MRI scan. Rare complaints reported were discomfort and warmth at the IPG site during scanning. Therapeutic efficacy of SNM was not affected 1 month after undergoing a non-head MRI scan.

REFERENCES

1. Quirouet A, Bhattacharyya PK, Dielubanza EJ, et al. Sacral neuromodulation device heating during lumbar and pelvic magnetic resonance imaging – A phantom study. Urology 2017; 107: 61-66.
2. Lloyd J.C., Gill B.C., Pizarro-Berdichevsky J., et al. 2017. Removal of Sacral Nerve Stimulation Devices for Magnetic Resonance Imaging: What Happens Next? Neuromodulation 2017; 20: 836–840.

Funding Society of Urodynamics, Female Pelvic Medicine, and Urogenital Reconstruction (SUFU) Grant **Clinical Trial** No **Subjects** Human **Ethics Committee** Institutional Review Board of the Cleveland Clinic **Helsinki** Yes **Informed Consent** Yes

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COST-EFFECTIVENESS OF SACRAL NEUROMODULATION VS. BOTOX FOR REFRACTORY URGENCY URINARY INCONTINENCE: RESULTS FROM THE ROSETTA TRIAL

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HYPOTHESIS / AIMS OF STUDY

To analyze the cost per reduction of daily urgency urinary incontinence episode (UUIE) of sacral neuromodulation (SNM) (InterStim/Medtronic®) versus onabotulinumtoxinA (Botox) (Botox A/Allergan®) for the treatment of refractory urgency urinary incontinence (UUI).

STUDY DESIGN, MATERIALS AND METHODS

This is a within-trial comparison of participants in the Refractory Overactive Bladder: Sacral Neuromodulation vs Botulinum Toxin Assessment (ROSETTA) multicenter randomized trial (February 2012- July 2016) at 9 US medical centers. Women with >6 UUIE over 3 days refractory to medications were randomized to 200 units of Botox performed in clinic or SNM performed as a staged procedure. Women in the SNM group with ≥50% UUIE reduction after Stage 1 were eligible for Stage 2 implant. The Botox group were allowed 2 additional injections, performed a minimum of 4 months apart. The analysis includes the intent-to-treat population with 24-month UUI data and was conducted from a health care sector perspective. Costs include treatment and medical utilization during the 24-month trial; results are in 2017 US dollars with a 3% discount rate. A resource-based costing method was utilized; medical service use was multiplied by average unit cost of the service with price weights based on national Medicare payment averages. Effectiveness was measured as mean decrease in daily UUIE. Our primary outcome was cost-effectiveness, defined as the cost per reduction of one UUIE/day. A decision analytic model was developed from trial data to evaluate the treatments through 5 years. Sensitivity analyses were performed to assess whether variable values affected results.

RESULTS

A total of 386 women were randomized; 84% of the SNM group were eligible for stage 2 implant. Over 24 months, 72% of the Botox group requested a second injection and 47% requested a third injection. Baseline characteristics were similar between groups: 82.6% were white, mean age was 63.2 ± 11.39 years, mean BMI was 32.1 ± 8.53 kg/m2, and mean UUIE/day was 5.2 ± 2.60. This analysis includes 141 (81%) of SNM and 152 (80%) of Botox participants. The mean reduction in UUIE/day at 24 months was not significantly different between groups (-2.93 ± 0.28 SNM vs -2.98 ± 0.31 Botox, p=0.8878). The cumulative mean per-person costs over 24 months were $38,260 for the SNM group and $7,836 for the Botox group (P<0.01).

INTERPRETATION OF RESULTS

The cost-effectiveness results through 24 months favored Botox, showing the SNM group incurred $10,429 higher costs per reduction of one UUIE/day than the Botox group. Estimates through 5 years also favored Botox, showing the SNM group incurred $9,740 higher costs per reduction of one UUIE/day. Threshold analysis was performed; with reduction of SNM device and procedure cost by 85%, Botox remained cost-effective at 24-months but SNM was more cost-effective at 5 years. With increased frequency of Botox injections to 5 per year, SNM was more cost-effective at 5 years.

CONCLUDING MESSAGE

For the treatment of refractory UUI, 200 U Botox was equally effective and less costly for reduction in UUIE compared to SNM at 24-months and based on modeling this was maintained at 5 years.

FIGURE 1

Table 1. Baseline characteristics and cost-effectiveness outcomes

Descriptor/Outcome	SNM (N=141)	Botox (N=152)	SNM vs. Botox
Age (mean +/- SD)	63.6 ± 12.0	62.7± 10.9	p=0.5070
Fraction White	85.8%	79.6%	p=0.1624
BMI (kg/m2) (mean+/-SD)	31.7 ± 7.9	32.5 ± 9.1	p=0.4106
Baseline UUIE/day (mean +/- SD)	5.15 ± 2.6	5.25 ± 2.6	p=0.7567
24-month Reduction in UUIE/day (mean +/- SD)	2.93 ± 2.8	2.98 ± 3.1	-0.05 p=0.8878
24-month per-person cost	$38,260 ± $12,324	$7,836 ± 12,443	$30,424 P<0.01
24-month Cost per reduction of one UUIE/day.	$13,058 per reduction of one UUIE/day	$2,629 per reduction of one UUIE/day	Botox is equally effective and less costly than SNM
5-year per-person cost	$40,711 ± $12,155	$13,186 ± $11,412	$27,525 P<0.01
5-year Cost per reduction of one UUIE/day. (assumed maintenance of 24-month UUIE effect)	$13,895 per reduction of one UUIE/day	$4,425 per reduction of one UUIE/day	Botox remains equally effective and less costly than SNM

Funding Eunice Kennedy Shriver National Institute of Child Health and Human Development and the NIH Office of Research on Women's Health at National Institutes of Health **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov Identifier: NCT01502956 **RCT** Yes **Subjects** Human **Ethics Committee** The institutional review board of each clinical site and the coordinating center approved the protocol **Helsinki** Yes **Informed Consent** Yes

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SACRAL NERVE MODUALTION OUTCOMES IN PATIENTS WITH CHRONIC URINARY RETENTION AND VOIDING DYSFUNCTION OVER 5 YEARS - 388 PATIENT CASE STUDY

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HYPOTHESIS / AIMS OF STUDY
To identify the success rate of sacral nerve modulation in patients with chronic urinary retention (CUR) and voiding dysfunction (VD), identified as having primary urethral dysfunction (Fowlers syndrome).

STUDY DESIGN, MATERIALS AND METHODS
Retrospective data was collected between January 2013 till January 2018 (5-year period) in the uro-neurology department. All the patients were diagnosed with urinary retention due to primary urethral dysfunction identified using cystometography (flow rate and post void residual measurements), urethral sphincter volume, urethral pressure profile and urethral electromyography (EMG). All patients underwent sacral nerve modulation (SNM) at the same unit under a single surgeon. This was carried out using the two-stage approach, with electrode insertion (stage 1) followed by battery insertion (stage 2) if stage one was deemed to be successful. The primary outcome measure was success rate of SNM. This was identified using improvement in quality of life as well as objectively using bladder diaries and flow rate and PVR measurements The failure rate was separated into primary failure after stage 1, true failure of the electrode and secondary failure (after insertion of the battery). Secondary complications were also identified including infection, pain, medical complications, displaced electrode.

No ethical submission was required.

RESULTS
A total of 388 patients were identified in this study. 369 patients were women, 17 were male and 2 were transgender. The overall success rate for SNM in patients with CUR was 85%. In male patients it was 82% whereas in women it was 86%. The overall primary failure rate was 10% and secondary failure rate was identified as 5%. The infection rate was 5%.

29 patients (7%) were identified to have had a successful SNM but required removal of the device. Of these patients 48% required removal due to infection, 17% as due to requiring MRI imaging for other pathology, 17% due to patient request, 14% due to pain and 4% due to pregnancy.

18 patients complained of other complications but despite these felt the benefit outweighed the complications and therefore the SNM device was left in situ. Of these patients 44% complained of battery site pain, 27% complained of leg pain, 11% complained of groin pain, 6% (1 patient) suffered from a haematoma, 6% (1 patient) suffered from a DVT and 6% (1 patient) complained of toe curling.

INTERPRETATION OF RESULTS
There was significant improvement in chronic urinary retention in both male and female patients with sacral nerve modulation. The overall infection rate of 5% is an appropriate risk in this surgery.

CONCLUDING MESSAGE
Sacral nerve modulation has a very high success rate in patients with chronic urinary retention with voiding dysfunction and should be considered as the gold standard in treatment for these patients.

Funding No funding **Clinical Trial** No **Subjects** Human **Ethics not Req'd** This was a clinicla case series with retrospective data collection **Helsinki** Yes **Informed Consent** Yes

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TINED LEAD TEST STIMULATION FOR SACRAL NEUROMODULATION. CLOSE FOLLOW UP WITH REPROGRAMMING DURING THE TEST PERIOD INCREASES NUMBER OF PATIENT RESPONDING TO TREATMENT

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HYPOTHESIS / AIMS OF STUDY
Sacral neuromodulation is a well-accepted treatment in urology for overactive bladder (OAB) and non-obstructive urinary retention (NOUR). The implant of the internal pulse generator (IPG) is usually preceded by a test using a temporary of definitive electrode. However, the duration of the test period varies between different centers, and no clear guidelines exist upon the optimal duration of the test, although a longer test identifies more patients that respond to this treatment.[1]

This study evaluates the clinical responses upon sacral neuromodulation with the tined lead procedure (TLP) during a three weeks test period with weekly reprogramming.

STUDY DESIGN, MATERIALS AND METHODS
In this prospective study from September 2015 until March 2018, 71 patients (age 20-79Y) with OAB or NOUR underwent a tined lead procedure.

Patient setup was done the same day as the TLP. The following electrode settings were tested: 0-3+/0-1+/0-2+/1-0+/1-2+/1-3+/2-0+/2-1+/2-3+/3-0+/3-1+/3-2+. Square wave pulses with pulse width of 210 µsec and 14 Hz frequency were delivered at the respective electrodes with increasing amplitudes up to the sensory threshold. The amplitude was noted

as well as the point that the patient marked. After one week patients were evaluated on their findings. If there was no changing or less than 50% improvement of the complaints, the electrode settings were tested again, and other electrode configuration was programmed. The same procedure could be repeated after two weeks, if necessary. Test success was defined as more than 50% improvement on voiding diary parameters: frequency and incontinence episodes for OAB and number of self-catheterizations for NOUR.

RESULTS

16 Patients (22,8%) were male and 55 patients (77,4%) female. 45 Patients (63,3%) were primarily treated for OAB and 26 patients (37,2%) for NOUR. Neurogenic disorders were present in 9 (12,6 %) of the patients and bladder pain complaints in 2 (2,8%) patients.

All 71 records were useful.

After the three weeks test period: 42 of the 71 patients (59,1%) were considered successful test responders. After the first week, 20 of the 71 (33,8%) patients had an improvement of 50% and didn't need other parameter settings during the test phase. 4 patients out of 71 didn't received other settings due to circumstances and also didn't get the IPG implant. The other 47 patients (66,1%) were reprogrammed based upon their sensory responses after 1 week. At the end of the second week 23 out of 47 patients (48,9%) received a third reprogramming, 8 out of 23 (34,7%) had an improvement of 50% or more. At the end of the third week 22 out of 47 (46,8%) patients met the criteria for test responders.

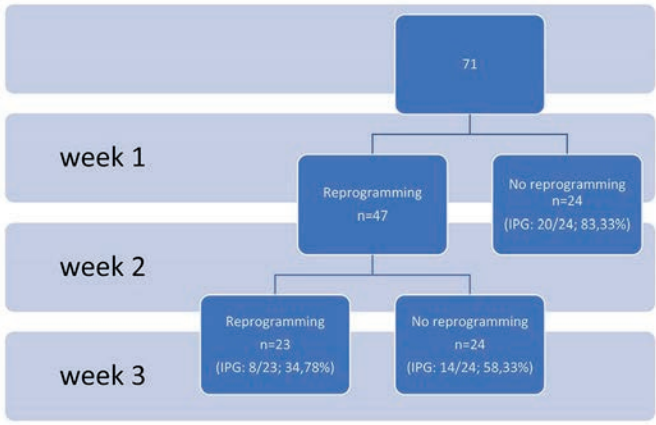
INTERPRETATION OF RESULTS

This study shows that almost half of the study subjects responding to the test procedure (22/47; 46,8%) were reprogrammed after 1 or 2 weeks possibly suggesting the initial settings used to start the test period were not the most optimal ones. Furthermore, out of the 29 patients that failed the test period, 14 (48,3%) patients didn't received reprogramming after one or two weeks due to lack of patient responsibility to contact the treatment center, thereby reducing their own chance of a succesful test procedure.

CONCLUDING MESSAGE

Close follow up of patients during tined lead testing with reprogramming sessions may help to identify patients which were initially programmed with a suboptimal electrode configuration settings and thereby increasing efficacy rates of the tined lead procedure. To achieve such a close follow up, the patient should be clearly informed of its benefits.

FIGURE 1



REFERENCES

1. Kessler TM, Madersbacher H, Kiss G. Prolonged sacral neuromodulation testing using permanent leads: a more reliable patient selection method? Eur Urol 2005; 47: 660-5.

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Committee for Medical Ethics UZA-UAntwerp (CME) **Helsinki** Yes **Informed Consent** Yes

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THE ECOIN™ IMPLANTABLE TIBIAL NERVE STIMULATION DEVICE FOR OVERACTIVE BLADDER SYNDROME IMPROVES QUALITY OF LIFE

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HYPOTHESIS / AIMS OF STUDY

This is a report of a prospective, international multicenter 12 week trial of the novel implantable eCoin™ system for tibial nerve stimulation (TNS) that evaluated changes from baseline in overactive bladder syndrome (OAB) symptoms on voiding diaries and patient reported outcomes after 12 weeks of treatment at 7 centers.

STUDY DESIGN, MATERIALS AND METHODS

46 subjects were implanted with the eCoin™ device over the posterior tibial nerve at baseline (Figure) and then automatically treated for 30 minute sessions. Subjects completed 3-day bladder diaries to assess change in voiding symptoms at 4, 8 & 12 weeks from baseline. Subjects also completed the Incontinence Quality of Life (iQOL) and Patient Global Impression of Improvement (PGI-I) questionnaires. Safety was evaluated by reported adverse events. The eCoin™ system was implanted subcutaneously posterosuperior to the

medial malleolus over the tibial nerve under local anesthesia in the office.

RESULTS

Three of the 46 subjects were excluded, one who did not receive therapy and two because of incomplete baseline data. .The mean age of the 43 women implanted was 62.5± 11.3 years. After 12 weeks of treatment there was a 63% reduction in urgency urinary incontinence episodes (UUI) with a decrease from 5.24 ± 2.93 to 1.95 episodes/day at 3 months. The mean iQOL score at baseline was 45.9±20.8 and improved to 26.5±21.2 after 3 months of treatment (p=0.0004). The iQol has a minimally important difference (MID) of 10 points. Seventy-two percent of subjects (31/43) met this threshold and had a ≥10 point change in their iQOL scores after 12 weeks of treatment. After 12 weeks, 31 of 43 subjects (72%) said they were better, much better, or very much better on the PGI-I. Thirteen subjects reported feeling "better" (30%), 3 reported feeling "much better" (7%) and 15 reported feeling "very much better" (35%) on the PGI-I.

Serious adverse events were noted in 3 subjects. Cellulitis secondary to an ankle wrap occurred in one subject, one subject who had edema at baseline developed a limp with leg edema from pre-existing hip bursitis and one had an unrelated pneumonia.

INTERPRETATION OF RESULTS

These data from this feasibility trial show that there was a significant improvement in urinary continence associated with a clinically meaningful improvement in quality of life.

CONCLUDING MESSAGE

These data, showing a significant improvement in quality of life and UUI suggest great promise for eCoin™ stimulation of the tibial nerve to treat OAB without the need for weekly office visits.

FIGURE 1

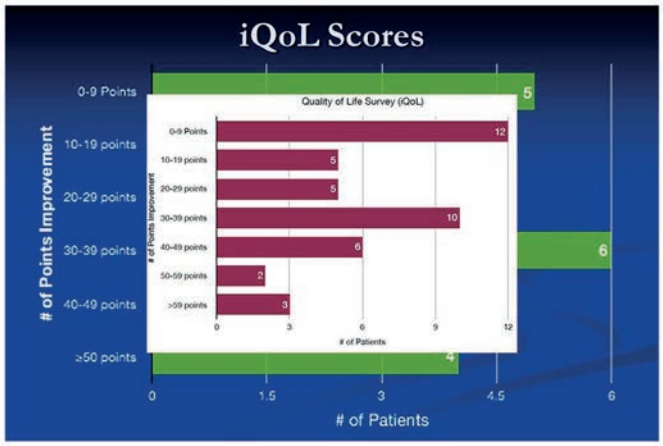
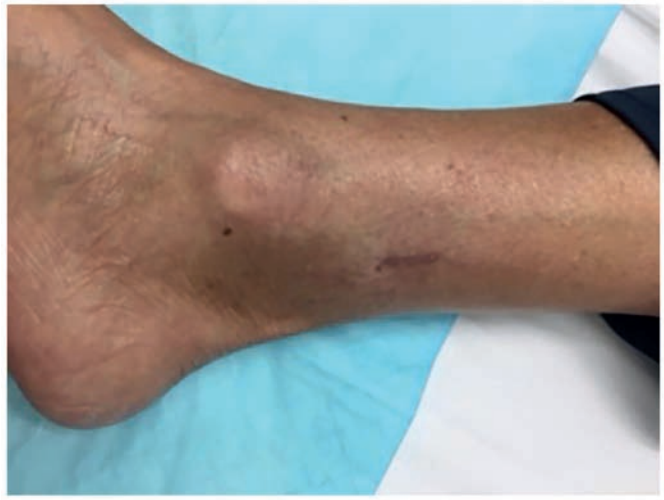


FIGURE 2



Funding Valencia Technologies **Clinical Trial** Yes **Registration Number** Clinicaltrials.gov, NCT03029624 **RCT** No **Subjects** Human **Ethics Committee** Quorum Review (Central IRB) **Helsinki** Yes **Informed Consent** Yes

443

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BEST IN CATEGORY PRIZE "PELVIC ORGAN PROLAPSE"

THE LARGE CAPACITY BLADDER OVER 600 ML IS ASSOCIATED WITH ONGOING INCOMPLETE BLADDER EMPTYING FOLLOWING ANTERIOR AND/OR APICAL PROLAPSE REPAIR (2009-2015)

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HYPOTHESIS / AIMS OF STUDY

Pelvic organ prolapse can result in kinking of the bladder neck and bladder outlet obstruction. Surgical correction of anterior and/or apical prolapse results in an anatomic unkinking of the bladder outlet by realigning the bladder with the bladder neck and urethra, which in theory corrects anatomic outlet obstruction. The most commonly cited female obstruction nomogram was published by Blaivas and Groutz (2000) [1], which classified women into three grades of obstruction, based on the voiding detrusor pressure cutpoints of 57 and 107 cmH2O for differentiating mild, moderate and severe obstruction. However additional nomograms have identified much lower pressure cutpoints (20-25 cmH2O), and have included the addition of flow cutpoints (11-15 mL/s) and fluoroscopic criteria [Chassagne (1998), Nitti (1999) [2], Lemack and Zimmern (2000) [3], Defreitas (2004)]. What is not defined by these nomograms is the influence of large bladder capacity on voiding efficiency in the setting of bladder outlet obstruction and pelvic organ prolapse. To improve patient counseling in women with large capacity

bladder considering prolapse repair, we sought to describe urodynamic (UDS) factors associated with the large capacity bladder in women who subsequently underwent anterior and/or apical prolapse repair at our institution over a 6-year period.

STUDY DESIGN, MATERIALS AND METHODS

After obtaining IRB approval, we identified 592 sequential patient records, which contained anterior and/or apical prolapse repair CPT codes from the years 2009 to 2015. We identified 358 records from this group with possible pre-operative UDS CPT codes. Our data core exported additional demographics and ICD codes (28,744 data rows). A two-reviewer case-by-case retrospective chart review was performed for: additional demographics; UDS parameters; UDS tracings; pre-operative POP-Q stage; date of surgery; operation; date and volume of all post void residuals (PVR) after surgery. This revealed 266 women with verified pre-operative UDS followed by prolapse repair.

Our primary variable of interest was pre-operative bladder capacity at time of UDS. Women were stratified by capacity, with the third tertile used to define large bladder capacity. Voiding efficiency (VE = voided volume / bladder capacity) was estimated before and after surgery using PVR and capacity. Our secondary variable of interest was longest follow-up PVR >200 mL, which was used to define elevated PVR after surgery. Comorbid covariates were identified by ICD code: any instance of diabetes, hyperlipidemia, neuropathy, obesity and urinary tract infection (UTI). Data were analyzed in SAS (Cary, NC, USA) using chi-square test, t-test, univariate and multivariate logistic regression, and Kaplan-Meier methods. A p-value <0.05 was defined as significant.

RESULTS

All 266 women (mean age 61 years) had preoperative UDS tracing, surgical and follow-up data available for analysis. Preoperative UDS revealed a mean: Pdet@Qmax 22 cmH2O (IQR 12-30), Qmax 18 mL/s (IQR 11-23), capacity 529 mL (IQR 370-659, σ=207), PVR 120 mL (IQR 5-160). The third tertile cutpoint for large capacity bladder was >600 mL (33%, n=88). Women with prolapse [POP-Q Stage: I (n=14), II (n=120), III (n=118), IV (n=14)] underwent anterior-only (n=115), apical-only (n=41) or combination anterior-apical (n=110) prolapse repair. Sling placement was performed in 56% (n=150) patients at time of prolapse repair. Comorbid conditions included diabetes (14%), hyperlipidemia (34%), neuropathy (6%), obesity (17%), and UTI (45%). Following prolapse repair, 239 out of 266 patients had a follow-up PVR recorded. There were a total of 519 PVR values recorded at up to 2,949 days (mean 395, σ=659) and 9 time points (median 2, IQR 1-3) after surgery. Mean PVR at longest follow-up was 66 mL (σ=120).

On univariate analysis, large capacity bladder >600 mL was associated with a younger age (mean 57 vs. 63 years; p<0.001) at time of prolapse repair. There was no significant difference in the proportion of large bladders with diabetes (p=0.508), hyperlipidemia (p=0.259), neuropathy (p=0.206), obesity (p=0.613) and UTI (p=0.387). POP-Q stage 3+ prolapse tended to occur in large bladders (57 vs. 46%; p=0.099). On UDS, large capacity (vs. <600 mL) had a mean: capacity of (763 vs. 413 mL; p<0.001), Pdet@Qmax (22 vs. 21 cmH2O; p=0.611), Qmax (20 vs. 17 mL/s; p=0.065), PVR (208 vs. 76 mL; p<0.001), VE (73 vs. 81%; p=0.027). There was no difference in prolapse stage or type of repair for large versus <600 mL capacity bladders. A similar proportion of large (vs. <600 mL) bladders underwent sling placement at time of prolapse repair (n=44/88 vs. 106/178; p=0.139). Follow-up PVR revealed a significantly elevated PVR in all patients with large bladder (23% >100 mL, p=0.038; 15% >200 mL, p=0.003; 11% >300 mL, p=0.001), however 44% of patients with a large (vs. <600 mL) bladder had a PVR improvement of >100 mL (n=39/88 vs. 50/178; p=0.008) on longest follow-up when compared to their pre-operative PVR.

In order to characterize changes in PVR over time and identify pre-operative patient characteristics associated with incomplete emptying after prolapse repair, longest follow-up PVR >200 mL was used to define elevated PVR after surgery. The 27 women with no recorded follow-up PVR were excluded from PVR analysis. On univariate logistic regression (Figure 1) for the response variable longest follow-up PVR >200 mL, the following factors were associated with elevated follow-up PVR: UTI (OR 3.85; CI 1.36-10.90; p=0.011), capacity >600 mL (OR 3.74; CI 1.48-9.46; p=0.005), and pre-operative PVR >100 mL (OR 3.01; CI 1.21-7.47; p=0.018), >200 mL (OR 2.82; CI 1.10-7.28; p=0.031), >300 mL (OR 4.44; CI 1.54-12.90; p=0.006). Specific thresholds for pre-operative factors associated with longest follow-up PVR >200 mL included increased capacity (mean 647 vs. 518 mL), elevated pre-operative PVR (mean 231 vs. 105 mL), and poor VE (mean 66 vs. 80%). On stepwise backward logistic regression, our final multivariate model identified UTI (OR 3.74; CI 1.31-10.72; p=0.014) and capacity >600 mL (OR 3.64; CI 1.42-9.34; p=0.007) as independent factors associated with longest follow-up PVR >200 mL (AUC=0.727). Pre-operative capacity was assessed as a continuous variable, for the outcome longest follow-up PVR >200 mL, with a capacity cutpoint of 600 mL located at the left upper corner of the ROC (AUC=0.673). As a categorical value, the AUC was 0.658. To look at the association between time and longest follow-up PVR, we applied Kaplan-Meier cumulative incidence function methods (event = longest follow-up PVR >200 mL). Using this approach, UTI was associated with a higher proportion of patients with a PVR >200 mL at most recent follow-up, however the confidence interval included the null association (HR 1.81; CI 0.69-4.75). On Kaplan-Meier analysis for pre-operative capacity (Figure 2), a capacity >600 mL was significantly associated with a higher proportion of patients with PVR >200 mL at most recent follow-up (HR 3.60; CI 1.50-8.63).

INTERPRETATION OF RESULTS

Large bladder capacity >600 mL was associated with worse pre-operative PVR (mean 208 vs. 76 mL), poor VE (73 vs. 81%) and elevated PVR at longest follow-up (>100-300 mL). On multivariate regression, independent factors associated with longest follow-up PVR >200 mL were UTI (OR 3.74) and

capacity >600 mL (OR 3.64). On Kaplan-Meier analysis, a capacity >600 mL was associated with a higher proportion of patients with PVR >200 mL at longest follow-up (HR 3.60).

CONCLUDING MESSAGE

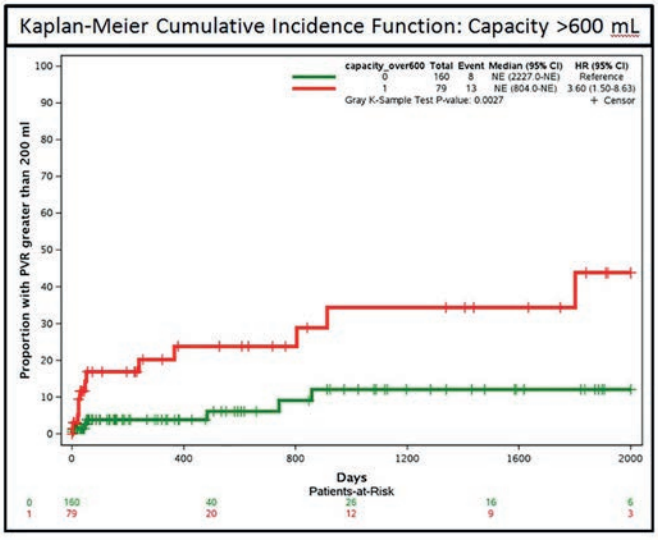
In a woman considering anterior and/or apical prolapse repair, a large pre-operative bladder capacity >600 mL should raise the clinician's index of suspicion for ongoing incomplete bladder emptying following surgery.

FIGURE 1

Univariate and Multivariate Logistic Regression
(Outcome Longest Follow-up PVR >200 mL)

	UNIVARIATE			MULTIVARIATE		
	Odds Ratio	Confidence Interval	(p-value)	Odds Ratio	Confidence Interval	(p-value)
Age (Date of Surgery)	0.98	0.94 - 1.02	0.294	0.97	0.93 - 1.02	0.233
Diabetes	2.04	0.69 - 5.98	0.196	2.35	0.71 - 7.85	0.164
Hyperlipidemia	0.70	0.26 - 1.89	0.485	0.56	0.18 - 1.74	0.318
Neuropathy	1.42	0.30 - 6.70	0.654	1.55	0.30 - 8.07	0.604
Obesity	1.58	0.54 - 4.59	0.400	1.25	0.39 - 4.03	0.707
UTI	3.85	1.36 - 10.90	0.011	3.87	1.31 - 11.42	0.014
Stage 3+ Anterior Prolapse	0.63	0.25 - 1.57	0.320	0.77	0.29 - 2.04	0.601
	Odds Ratio	Confidence Interval	(p-value)	Odds Ratio	Confidence Interval	(p-value)
Capacity > 600 mL	3.74	1.48 - 9.46	0.005	3.17	1.17 - 8.54	0.023
Pdet@Qmax > 20 cm H2O	1.00	0.97 - 1.03	0.858	0.71	0.28 - 1.82	0.475
Qmax < 10 mL/s	1.43	0.50 - 4.15	0.506	1.27	0.40 - 4.05	0.690
Pre-op PVR > 200 mL	2.82	1.10 - 7.28	0.031	1.77	0.60 - 5.18	0.301
	Odds Ratio	Confidence Interval	(p-value)	Odds Ratio	Confidence Interval	(p-value)
Anterior Only	1.48	0.60 - 3.63	0.393	1.16	0.43 - 3.16	0.765
Apical Only	0.57	0.13 - 2.56	0.463	0.65	0.13 - 3.23	0.595
Sling Placement	0.80	0.33 - 1.97	0.632	0.78	0.32 - 1.95	0.601
Sling Removal	3.87	0.96 - 15.60	0.057	3.58	0.84 - 15.20	0.084

FIGURE 2



REFERENCES

1. Blaivas JG, Groutz A (2000) Bladder outlet obstruction nomogram. Neurourol Urodyn 19:553–564.
2. Nitti VW, et al (1999) Diagnosing bladder outlet obstruction in women. J Urol 161:1535–1540
3. Lemack GE, et al (2000) Identifying women with outflow obstruction. J Urol 163:1823–1828

Funding NIH KL2 TR 001083 **Clinical Trial** No **Subjects** Human **Ethics Committee** Stanford Institutional Review Board (IRB) **Helsinki** Yes **Informed Consent** No

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IS IT POSSIBLE TO DEFINE RISK FACTORS FOR THE ANATOMICAL OR SYMPTOMATIC RECURRENCE OF PELVIC ORGAN PROLAPSE SURGICALLY CORRECTED USING NATIVE TISSUE?

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HYPOTHESIS / AIMS OF STUDY

Since some years, specially, after the well-known FDA alerts, the use of synthetic mesh inlays or biological grafts against standard repair with native tissue (NT) has caused a lot of controversy and raised enquires about safety and efficacy of these techniques1.Because of this, a renewed interest has emerged about the reconstructive surgery of pelvic organ prolapse (POP) using NT. In contrast with previous publications -which reported high rates of recurrence and reoperation – more recent investigations do not find differences between NT repair and repair augmented with synthetic mesh although risk factors for recurrence need to be clarified. For example, some authors have described the role of the apical support in the posterior and anterior vaginal prolapse2 or the need for apical support at the time of an anterior repair3.

Our objective was to evaluate the efficacy of NT repair as treatment of POP affecting anterior and/or posterior vaginal compartment and to define if there are risk factors associated with POP recurrence

STUDY DESIGN, MATERIALS AND METHODS

Longitudinal, prospective, unicentric, open study including women surgically treated of POP affecting anterior and/or posterior vaginal compartment NT repair and/or simultaneously treated of stress urinary incontinence (SUI) using suburethral sling. Women surgically treated of apical POP were excluded. In all cases the procedure was the primary surgery (anterior and/or posterior colporrhaphy plus suburethral sling insertion as needed). Our study was carried out from January 2012 to December 2017. Evaluations were performed basally and at one and six months, and at one and two years after surgery. Anatomic POP recurrences were defined if, at any of the examinations, POP ≥ II, according Baden-Walker classification, was found. Symptomatic POP recurrences were diagnosed if the women have any symptom of POP after surgery and/or answered positively to the question "Do you usually have a sensation of bulging or protrusion from the vaginal area?", a Pelvic Floor Disease Inventory Questionnaire (PFDI)-based question because the ability to see or feel a vaginal bulge is the symptom most consistently related to the presence or absence of POP.

All outcomes measures were presented as summaries of descriptive statistics (mean [SD] for continuous measures and proportions for ordinal and dichotomous measures) and comparisons between groups were analysed using T-Stu-

dent and χ2 when needed. Also ordinal logistic and multinomial regression were used according to the characteristics of the variables and/or because the type of association required. STATA 14 has been used.

RESULTS

Between January 2012 and December 2017, 889 surgical procedures were performed at our Urogynecology Unit. Among these, surgical repair of POP with native tissue has been accomplished in 559 patients (62.9%). After applying inclusion criteria, 297 patients were eligible. 113 to which anterior and/or posterior vaginal compartment NT repair was the only procedure performed; and 184 patients in which in addition to the NT repair, stress urinary incontinence was simultaneously treated by placing a suburethral sling. Demographics and data about the patient characteristics can be found in the graphics and tables attached.

Considering the symptoms observed, 145 patients (49.0%) consulted for "feeling of bulge", 71 (24.0%) for bulge and urinary incontinence and 76 (26.0%) only for incontinence. The prevalence of symptoms such as urgency, frequency and nocturia was 43.1%, 33.3% and 52.5%, respectively. After careful examination, 75 (25.2%) patients were diagnosed with anterior compartment prolapse, 33 (11.1%) posterior compartment, and 192 (64.6%) of both compartments. 67 (22.6%) patients also had apical prolapse grade I that was not corrected. SUI was found in 118 (39.7%) and mixed urinary incontinence (MUI) with predominance of the stress component in 84 (28.3%).

Regarding surgery, 99 (33.3%) anterior, 52 (17.5%) posterior and 146 (49.2%) anterior and posterior colporraphies were performed. A TOT suburethral sling was placed in 105 (58.7%) patients, TVT in 34 (18.7%), Needleless in 13 (7.1%) and a Reemex device in 29 (15.5%) patients. Bladder perforation was observed as the unique intraoperative complication and it happened in 6 patients (2%), all of them in the group that had undergone sling placement. During the immediate postoperative period, 19 (7.1%) complications were noticed, 14 of them (76.2%) occurred in patients who had undergone SUI surgery (12 of them presented acute urinary retention, requiring urethrolysis in two cases, and 2 suffered pain that required mesh burial. 5 (4.0%) patients needed reintervention, 3 of them due to complications associated with the sling (urinary obstruction, pain ...) that required surgical removal and 2 due to symptomatic prolapse recurrence that required a new prolapsed operation during the first year of follow-up.

INTERPRETATION OF RESULTS

No significant differences were found between groups when comparing need of reinterventions. Regarding follow-up and recurrence, at the end of one year,193 records were obtained. The overall successful procedure (POP<II) rate was 87%(n=168). A 9.8% (n=19) of anatomical prolapsed recurrence and a 3.1%(n = 6) of symptomatic prolapsed recurrence were observed. After two years of follow-up, the anatomical recurrence and the symptomatic recurrence rate were 6.9% and 3.1% respectively. We found 29 (9.7%) prolapsed recurrences. 79.3% (23/29) in the same compartment and 20.7% (6/29) in a different one. The group of patients without recurrence has been compared with both, patients with anatomic and patients with symptomatic recurrence according to variables such as age, BMI, parity, exposure to physical activity, degree of prolapse, suburethral sling insertion and the presence of apical prolapse not corrected at the time of intervention. No significant differences have been found. See table 1 and 2.

CONCLUDING MESSAGE

NT-based POP surgery is associated with a low symptomatic POP recurrence rate, and a very low rate of reoperation due to recurrence. Probably due to the low number of recurrences we have not identified risks factors associated with recurrence. Particularly, recurrence rates in women affected of apical POP stage I not corrected at the time of surgery with NT are similar to those in women not affected. In our experience NT-based POP repair is associated with minimal possibilities of reoperation due to POP recurrence and a low rate of complications. This fact strengthens the role of the NT-based POP repair as the primary surgical option

FIGURE 1

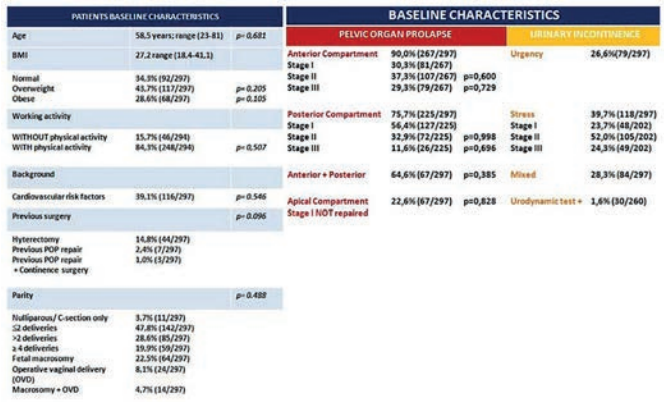

FIGURE 2

Table 2. Follow-up and anatomic and symptomatic recurrence rates

	FOLLOW UP			
	1 month	6 month	1 year	2 year
Success POP < II	287	217	168	118
NON symptomatic prolapse	7	32	19	9
SYMPTOMATIC prolapse	2	5	6	4
Losses	1	43	104	166
Total	296	254	193	131

	1 year follow-up	2 year folow-up
Anatomic POP recurrence rate ≥ II	9,8% (19/193)	6,9% (9/131)
Symptomatic POP recurrence rate	3,1% (6/193)	3,1% (4/131)

REFERENCES

1. Urogynecologic Surgical Mesh: Update on the Safety and Effectiveness of Transvaginal Placement for Pelvic Organ Prolapse. Avalaible at: Urogynecologic Surgical Mesh:

Update on the Safety and Effectiveness of Transvaginal Placement for Pelvic Organ Prolapse (accessed March 2017
2. Lowder, JL et al The Role of Apical Vaginal Support in the Appearance of Anterior and Posterior Vaginal Prolapse. Obstet Gynecol 2008. doi: 10.1097/01.AOG.0000297309.25091.a
3. Eilber KS et al. Outcomes of Vaginal Prolapse Surgery Among Female Medicare Beneficiaries: The Role of Apical Support. Obstet Gynecol. 2013 Nov; 122(5): 10.1097/AOG.0b013e3182a8a5e4.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** It is not a trial **Helsinki** Yes **Informed Consent** Yes

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A STUDY ON HIATAL AREA AFTER SURGICAL REPAIR OF PELVIC ORGAN PROLAPSE

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HYPOTHESIS / AIMS OF STUDY
Hiatal area is related to symptoms of prolapse. This study aimed at evaluating the hiatal area after surgical repair of pelvic organ prolapse (POP) and the factors affecting it.

STUDY DESIGN, MATERIALS AND METHODS
This is a preliminary analysis of a prospective study. Women had perineal ultrasound (US) in a standard way before surgical treatment for POP. US volumes at rest, during maximum Valsalva and pelvic floor contraction (PFMC) were stored. Generally, for women who had uterine prolapse would receive vaginal hysterectomy and pelvic floor repair (VHPFR). Women who had stage III uterine prolapse would receive concomitant anterior vaginal mesh repair and sacrospinous fixation (SSLF) if their aged was older (>65 years) and sexually inactive. If they were sexually active, they would receive concomitant laparoscopic sacrocolpopexy. If women opted not for mesh repair, they would receive SSLF. If they had vaginal vault prolapse, vaginal mesh repair or laparoscopic sacrocolpopexy would be performed according to their age and sexual status. They were followed up at 3 months, and then annually. Perineal US were performed in the same way. Offline analysis was performed to study the hiatal area and levator ani muscle (LAM) avulsion in standard way in this study.

RESULTS
78 women, mean age of 70.9±7.3 years, were included. In all, 53% and 47% had stage II and III/IV POP, respectively. Among them, 44 (56.4%), 4 (5.1%), 12 (15.3%), 6 (7.7%) had VHPFR, VHPFR+SSLF, VHPFR+anterior vaginal mesh±SSLF and VHPFR+laparoscopic sacrocolpopexy, respectively. Twelve (15.3%) had history of hysterectomy and received vaginal mesh repair or sacrocolpopexy. The mean follow-up duration was 26±23 months.

28% of women were found to have LAM avulsion. Women with LAM avulsion or stage III POP had significantly larger hiatal area before surgery (table 1). Hiatal areas were significantly reduced after the operation (table 2). There was a tendency of, but not statistical significant, more reduction of hiatal area for women with stage III/IV POP when compared with stage II POP. Women who received mesh repair had more reduction in hiatal area but this did not reach statistical significance (table 3). In women with LAM avulsion, there was significantly more reduction in hiatal area after mesh repair when compared to those without the avulsion (table 4).

INTERPRETATION OF RESULTS
Women who had LAM avulsion or more advanced stage of POP had larger hiatal area. Hiatal areas were significantly reduced after surgical repair of POP. More reductions were found after mesh repair. However, this only reached statistical significant in the group with LAM avulsion, but not in those without LAM avulsion.

CONCLUDING MESSAGE
Hiatal areas were significantly reduced after surgical repair of POP. More reductions were found after mesh repair in women with LAM avulsion. A larger study is needed to confirm the findings.

FIGURE 1

Table 1. Hiatal area of women with or without LAM avulsion before and after surgical repair

	LAM avulsion (n = 22)	No LAM avulsion (n = 56)	P-value[1]	Stage II POP (n = 40)	Stage III POP (n = 38)	P-value[2]
Pre-operative findings						
Hiatal area at rest (cm²)	22.6 (8.9)	19.8 (5.1)	0.08	19.1 (5.1)	22.2 (7.3)	0.035
Hiatal area during VM (cm²)	29.8 (9.2)	25.6 (9.5)	0.1	25.1 (9.2)	28.9 (9.8)	0.09
Hiatal area during PFMC (cm²)	20.5 (6.5)	16.2 (3.5)	0.009	16.2 (4.1)	18.7 (54)	0.03
Post-operative findings						
Hiatal area at rest (cm²)	20.5 (4.5)	18.6 (4.6)	0.10	18.1 (4.0)	20.3 (5.0)	0.046
Hiatal area during VM (cm²)	26.8 (7.5)	19.6 (10.7)	0.005	21.2 (10.0)	22.1 (10.6)	0.69
Hiatal area during PFMC (cm²)	17.9 (3.5)	15.7 (4.3)	0.047	15.6 (4.0)	17.3 (4.2)	0.08
Change of hiatal area at rest	-2.1 (7.7)	-0.8 (5.9)	0.44	-0.3 (4.7)	-2.0 (7.9)	0.29
Change of hiatal area during VM	-3.0 (7.3)	-6.2 (12.1)	0.24	-4.0 (10.7)	-6.7 (11.3)	0.26
Change of hiatal area during PFMC	-2.5 (5.2)	-0.4 (4.4)	0.08	-0.7 (4.3)	-1.5 (5.2)	0.53

P-value[1]: with vs without LAM avulsion; P-value[2]: stage II vs stage III POP

Table 2. Hiatal area during pre-operative and post-operative scans for all patients

	Before operation	After operation	Mean difference	P-value
Hiatal area at rest (cm²)	20.4 (6.5)	19.2 (4.6)	-1.2 (6.5)	0.003
Hiatal area during VM (cm²)	27.0 (9.6)	21.6 (10.3)	-5.3 (10.9)	0.003
Hiatal area during PFMC (cm²)	17.6 (5.1)	16.5 (4.2)	-1.1 (4.7)	0.003

FIGURE 2

Table 3. Hiatal area of women with mesh repair against women with native tissue repair

	Mesh repair (n = 30)	Native tissue repair (n = 48)	P-value
Change of hiatal area at rest	-2.8 (7.1)	-0.1 (5.9)	0.08
Change of hiatal area during VM	-7.0 (9.6)	-4.3 (11.7)	0.28
Change of hiatal area during PFMC	-2.0 (4.6)	-0.5 (4.8)	0.20

Table 4. Relationship of hiatal area with or without mesh repair in women with or without LAM avulsion

	Mesh repair (n = 20)	Native tissue repair (n = 36)	P-value
No LAM avulsion group			
Change of hiatal area at rest	-1.6 (5.3)	-0.2 (6.3)	0.46
Change of hiatal area during VM	-7.3 (11.3)	-5.6 (12.6)	0.64
Change of hiatal area during PFMC	-1.1 (2.9)	0.0 (5.1)	0.35
LAM avulsion group	(n = 10)	(n = 12)	
Change of hiatal area at rest	-5.1 (9.3)	-0.0 (7.4)	0.10
Change of hiatal area during VM	-6.6 (5.4)	-0.6 (7.5)	0.032
Change of hiatal area during PFMC	-3.4 (6.7)	-1.8 (3.6)	0.49

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Joint Chinese University of Hong Kong New Territories East Cluster Clinical Research **Ethics Committee Helsinki** Yes **Informed Consent** Yes

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ARE THERE ANY ANATOMICAL FINDINGS TO PREDICT VOIDING DISFUNCTION SYMPTOMS IN WOMEN WITH ANTERIOR COMPARTMENT PELVIC ORGAN PROLAPSE?

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HYPOTHESIS / AIMS OF STUDY

Voiding disfunction has been associated with pelvic organ prolapse (POP) in the anterior, apical and posterior compartments. Urethral distortion due to a large cystocele is a plausible mechanism for the anterior compartment. Obstruction secondary to bulge pressure can be the mechanism for apical and posterior, however the influence of these compartments is much more controversial (1). Among other factors that can influence the complex process of voiding, ageing also has an important negative impact (2).

The aim of the study was to evaluate if there are any anatomical findings that predict voiding disfunction symptoms in women with anterior compartment pelvic organ prolapse. We hypothesized that not only prolapse severity, but also other anatomical findings such as a short genital hiatus or urethral kinking may be associated with voiding disfunction symptoms in these patients.

STUDY DESIGN, MATERIALS AND METHODS

This was a cross-sectional multicentre study including all women with symptomatic anterior compartment prolapse that were evaluated in the pelvic floor units of two different hospitals between May 2015 and September 2017 prior to surgery. Pelvic organ prolapse was described according to the Pelvic Organ Quantification (POPQ) system. Two gynecologists blinded to symptoms reports performed the examination. Urethral kinking was defined when point Aa was less than + 3 and at least 2 cm higher than point Ba. Obviously, when point Aa reaches maximum descent (+3) kinking is not possible, even if point Ba has greater values. Short genital hiatus was defined at less than 4 cm.

Symptoms of voiding dysfunction were identified using the validated Spanish version of the Pelvic Floor Distress Inventory short form (PFDI-20) (3). Specifically, we used question 5: "Usually experience a feeling of incomplete bladder emptying?" and 6: "Ever have to push up on the bulge in the vaginal area with your fingers to start or complete urination?" that corresponds to questions of the Pelvic Organ Prolapse Distress Inventory (POPDI-6).

Statistical analysis was done by proportion comparison (Chi-square) and multivariate analysis (multiple logistic regression model).

RESULTS

We included 481 patients with symptomatic anterior compartment prolapse scheduled for surgery. Mean age was 63.2 years (SD:9.7; range:37-86) and mean body mass index (BMI) was 29.8 (SD:5.7; range:16.8-70.4).

Of the total, 269 (55.9%) reported a feeling of incomplete bladder emptying, and 165 (34.3%) indicated the need to push up on the bulge in the vaginal area to start or complete urination in questions 5 and 6 respectively, from the PFDI-20 questionnaire. Prolapse examination in the anterior compartment indicated POPQ stage 2 in 93 (19.3%), stage 3 in 345 (71.7%), stage 4 in 43 (8.9%), and urethral kinking in 173 (36.0%) patients. Maximum urethral descent (point Aa +3) was identified in 86 (17.9%) women. Prolapse examination also identified POPQ stage ≥ 2 in 259 (53.8%) women in the apical compartment, and in 157 (32.6%) in the posterior compartment. A short genital hiatus was identified in 31 (6.4%) women.

The association between different anatomical findings and urinary dysfunction symptoms was adjusted by age as a potential confounder. Voiding dysfunction symptoms were associated with anterior prolapse severity, apical prolapse, urethral kinging and short hiatus, especially when we evaluated the feeling of incomplete bladder emptying (table 1).

INTERPRETATION OF RESULTS

As expected, women with larger anterior compartment prolapse were more at risk for voiding dysfunction. Apical prolapse also had a negative effect on voiding, while posterior prolapse did not. Other anatomical findings that should be considered when evaluating the effect of prolapse on voiding function are urethral kinking and genital hiatus. It seems that urethral kinging was more associated with needing to push up the bulge, while a shorter hiatus increased the risk of incomplete bladder emptying sensation.

CONCLUDING MESSAGE

In patients with symptomatic anterior compartment prolapse, the severity of this prolapse and the association of an apical prolapse, urethral kinging or a short genital hiatus, increases the risk for voiding dysfunction symptoms.

FIGURE 1

Table 1. Results of the analysis performed to associate voiding dysfunction symptoms and different anatomical findings

	Incomplete bladder emptying			Need to push up on the bulge		
	n	OR*	95% CI	n	OR*	95% CI
Anterior prolapse						
POPQ 2 (%)	36 (38.7)	1 (ref)		18 (19.4)	1 (ref)	
POPQ 3 (%)	202 (58.6)	2.12	1.32–3.40	125 (36.2)	2.34	1.39 –4.08
POPQ 4 (%)	31(72.1)	3.09	1.38–6.93	22 (51.2)	4.05	1.81–9.12
Apical prolapse						
No (%)	97(43.7)	1 (ref)		64 (28.8)	1 (ref)	
Yes (%)	172 (66.4)	2.27	1.56–3.32	101 (39.0)	1.5	1.01–2.23
Posterior prolapse						
No (%)	192 (59.3)	1 (ref)		120 (37.0)	1 (ref)	
Yes (%)	77 (49.0)	0.67	0.45–0.99	45 (28.7)	0.69	0.45–1.04
Urethral kinking						
No (%)	152 (49.4)	1 (ref)		84 (27.3)	1 (ref)	
Yes (%)	117(67.6)	1.84	1.12–2.79	81 (46.8)	2.28	1.53-3.41
Short GH						
No (%)	244 (54.2)	1 (ref)		150 (33.3)	1 (ref)	
Yes (%)	25 (80.6)	2.88	1.14–7.24	15 (48.4)	1.73	0.86–3.63

*: Adjusted by age

REFERENCES

1. Dietz HP, Haylen BT, Vancaille TG. Female Pelvic Organ Prolapse and voiding Function. Int Uroginecol 2002; 13: 284-288.
2. Wagg A, Kung Chen L, Johnson II T, Kirschner-Hermanns R, Kuchel G, Markland A, Murphy C, Orme S, Ostaszkiewicz J, Szonyi G, Wyman J. Incontinence in frail older person. In Incontinence 6th edition 2017; Pag 1309-1442.
3. Sánchez-Sánchez B. et al Cultural adaptation and validation of the Pelvic Floor Distress Inventory short form (PFDI-20) and Pelvic Floor Impact Questionnaire short form (PFIQ-7) Spanish versions. Eur J Obstet Gynecol Reprod Biol. 2013;170(1):281-5.

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SUCCESSFUL PREGNANCY AND OUTCOMES AFTER SACROHYSTEROPEXY FOR UTERINE PROLAPSE

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HYPOTHESIS / AIMS OF STUDY

Vaginal hysterectomy in combination with apical suspension is the most common approach for addressing pelvic prolapse. However, this approach is counterproductive for women who desire future childbearing. It has been unclear how to counsel patients regarding their risk of pregnancy complications or recurrent prolapse symptoms following sacrohysteropexy. However, there have been several recent case reports of successful deliveries after surgical repair with no relapse of prolapse symptoms. [1,2,3]

The aim of this study is to evaluate the change in Pelvic Organ Prolapse Quantification (POP-Q) score in women who had a successful pregnancy and cesarean delivery after abdominal or robotic-assisted laparoscopic sacrohysteropexy. We hypothesized that women would have significant improvement in their apical prolapse after surgery, and maintain this improvement following delivery.

STUDY DESIGN, MATERIALS AND METHODS

We performed a retrospective review of electronic medical records of patients with a diagnosis of uterine prolapse who underwent an abdominal or robotic-assisted laparoscopic sacrohysteropexy with polypropylene mesh during an eight-year period from January 2004 to December 2012. We searched the database for the CPT code corresponding with sacrocolpopexy and further identified those patients who had a uterine-sparing procedure. All patients were evaluated with the POP-Q scoring system pre-operatively, once between 6 and 24 weeks after prolapse surgery, and again between 6 and 24 weeks after delivery. The data was tabulated and analyzed using SAS software, version 9.4 (SAS Carry, NC). Student t-test for paired design was used to compare POP-Q scores for point Aa, Ba, and C pre- and post-operatively, as well as before and after delivery.

RESULTS

One hundred and sixty-four were performed during the index period. We identified 8 patients who met criteria for inclusion in the study. All study subjects were of reproductive age (26 to 34 years old, mean age 32), had at least one prior vaginal delivery, and had symptomatic pelvic organ prolapse with or without urodynamic stress urinary incontinence. All patients underwent preoperative urodynamic studies prior to surgery. Three patients were excluded from the analysis: two of them did not conceive after the initial surgery, another patient was lost to follow-up after delivery. Of the 5 remaining patients, three had an abdominal sacrohysteropexy and two had a robotic-assisted laparoscopic procedure. Three patients had a concomitant mid-urethral sling; one had a perineal repair. All the patients conceived between 2.5 and 4 years after the initial prolapse surgery. One patient required repeat mid-urethral sling. There were no instances of recurrent apical prolapse. We observed a significant improvement in recorded POP-Q scores for point Aa, Ba and C after prolapse surgery. There was no significant change in these scores following pregnancy and cesarean delivery (Table 1, Table 2).

INTERPRETATION OF RESULTS

We noted significant improvement of the anterior compartment prolapse (POP-Q points Aa and Ba) among study subjects. However, the apical compartment (POP-Q point C) demonstrated the most significant and persistent improvement in scores during the observation period (mean differ-

ence 4 cm, p-value: 0.004), even after successful pregnancy and cesarean delivery (Table 2). The women in our study all delivered by cesarean section; the data does not address the option of vaginal delivery after surgical prolapse repair. Other authors have reported successful cases of vaginal delivery after sacrohysteropexy without recurrent prolapse.

CONCLUDING MESSAGE

Conservative management with observation, pelvic floor physical therapy or pessary is currently considered first-line therapy for management of pelvic organ prolapse among women who have not completed child-bearing. This study adds to a growing body of evidence which demonstrates that women managed definitively with sacrohysteropexy can expect to successfully carry pregnancies to term without significant relapse of their symptoms or anatomical failure up to 5 years after surgery. Further research is needed to determine the long-term risk of recurrent prolapse or the need for repeat surgical prolapse repair in women who become pregnant after initial sacrohysteropexy.

FIGURE 1

Table 1. Distribution of POP-Q scores

POP-Q point	Pre-operative	Post-operative	Post-partum
Aa	0.6 (0.89)	-0.6 (0.89)	-0.4 (0.89)
Ba	0.4 (1.1)	-0.6 (0.89)	-0.4 (0.89)
C	-2.6 (2.07)	-6.6 (0.89)	-6.2 (0.83)

Data are presented as mean in centimeters (SD); n=5

FIGURE 2

Table 2. Change in POP-Q scores following surgical repair and pregnancy

	Pre-operative/Post-operative	p-value	Post-operative/Post-partum	p-value
Aa	1.2 (0.37)	0.03	-0.2 (0.2)	0.37
Ba	1 (0.3)	0.03	-0.2 (0.2)	0.3
C	4 (0.7)	0.004	-0.4 (0.004)	0.47

Data are presented as mean difference in centimeters (SE); n=5
p-value ≤0.05 indicates statistical significance

REFERENCES

1. Pandeva I, Mistry M, Fayyad A. Efficacy and Pregnancy Outcomes of Laparoscopic Single Sheet Mesh Sacrohysteropexy. Neurourol Urodyn. 2017;36:787-793.
2. Balsak D, Eser A, Erol O, Altintas DD, Aksin S. Pregnancy and Vaginal Delivery after Sacrohysteropexy. Case Rep Obstet Gynecol. 2015:3.
3. Albowitz M, Schyrba V, Bolla D, Schoning A, Hornung R. Pregnancy After a Laparoscopic Sacrohysteropexy: a Case Report. Geburtshilfe Frauenheilkd. 2014 Oct;74:947-949.

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RETROSPECTIVE STUDY ESTIMATING THE ODDS OF MRI-DOCUMENTED PUBOVISCERAL MUSCLE TEAR IDENTIFIED BY INDEX FINGER PALPATORY ASSESSMENT IN POSTPARTUM WOMEN

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HYPOTHESIS / AIMS OF STUDY

Vaginal birth can cause pelvic floor injuries, such as pubovisceral muscle (PVM) tear, a known risk factor for developing pelvic floor disorders such as pelvic organ prolapse. Women with PVM tear may be asymptomatic before the pelvic floor disorders develop. The prevalence of the PVM tear can reach 36% among postpartum women [1]. PVM tear evaluation is not a routine clinical practice. The objective of this study was to estimate the ability to identify PVM tear on the basis of a clinical exam using index finger palpatory assessment of the PVM. Women who need the palpatory assessment were shown in Figure 1.

STUDY DESIGN, MATERIALS AND METHODS

Eighty-five women participated in this planned data study and had at least one risk factor for PVM tear during delivery (e.g., maternal age ≥ 33 years, second stage labor lasting ≥150 minutes, instrumented delivery, infant weight ≥ 4000 grams, and third or fourth degree anal sphincter laceration). Measures were obtained approximately 7 weeks after the first vaginal birth. A clinical visit included index finger palpatory assessment of the PVM bilaterally (palpating through the vaginal wall) to assess for PVM wholeness by an experienced nurse practitioner. If the body of the muscle is clearly felt, then coded as "present" on that side. If the body of the muscle completely torn away from its origin, then scored as PVM "absent." If the examiner was unable to completely certain of the "present" or "absent" of the muscle, then scored "equivocal." This process and scoring is then repeated on the opposite side. If both sides of PVM were present, without loss it was coded as 0. If one side PVM was palpable but another side was labeled as equivocal, it was coded as level 1. If both sides of PVM were labeled as equivocal, or one side was not palpable, it was coded as level 2. If both sides of PVM could not be palpated, it was coded as level 3. Magnetic resonance imaging (MRI) of the pelvis was done, as the gold standard measure of PVM status. PVM tears identified by MRI were initially categorized into 5 levels for each side: as no tear, subtle tear, less than 50% tear, greater than 50% tear, and complete tear for each side. Two sides of the tears were combined into four categories: no tear or subtle tear on both sides of PVM (coded as 0), < 50% unilateral tear (coded as level I), < 50% bilateral or ≥ 50% unilateral tear (coded as tear level II), and ≥ 50% bilateral tear (level III). Nurse practitioner and MRI radiologist were blind to each other's findings. Data were analyzed using proportional odds modeling.

RESULTS

Nine percent of the women were identified with "absent" PVM on both right and left sides by palpatory assessment while 20% of the sample were identified with "present" PVM on both sides (Table 1). MRI results showed at least a partial PVM tear in 35% of the sample while the remainder had none or subtle tear on MRI (Table 1). The odds ratio (OR) of MRI-documented PVM tear identified by palpatory assessment of the PVM for structural wholeness was 3.62 (95% CI 1.70 – 7.73), p = .001.

INTERPRETATION OF RESULTS

The estimated odds of having a high level MRI-documented PVM tear category increased by 3.62 for each level increase in PVM loss status to palpatory assessment.

CONCLUDING MESSAGE

Index finger palpatory assessment at the site of the PVM can be used to estimate the odds of PVM tear in postpartum women with known PVM tear risk factors. With that information, an informed decision can be made for diagnostic tests, (for instance obtaining an MRI) and for decisions regarding clinical care. They may also be applicability to large research studies for estimating odds of a PVM tear across various populations, especially if combined with a reported history of obstetric risk factors for PVM tear, such as forceps delivery.

FIGURE 1

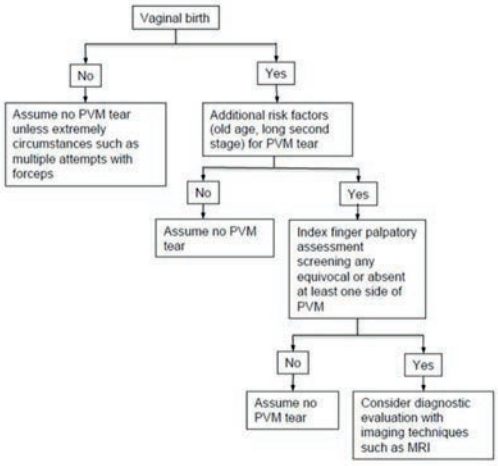

Figure 1. Conceptual model of who needs index finger palpatory assessment to clinically estimate pubovisceral muscle (PVM) status after childbirth

FIGURE 2

Table 1. Index finger palpatory assessment and MRI results

Index finger palpatory assessment for PVM tear	N=85, % (n)
"Present" bilaterally	20% (17)
"Present" on one side and "equivocal" on the other side	8% (7)
"Absent" on one side or "Equivocal" on both sides	62% (53)
"Absent" on both sides	9% (8)
MRI-documented PVM tear	
No tear (No or subtle PVM tear)	65% (55)
Level I tear (<50% unilateral PVM tear)	11% (9)
Level II tear (<50% bilateral PVM tear or ≥50% unilateral PVM tear)	15% (13)
Level III tear (≥50% bilateral PVM tear)	9% (8)

REFERENCES

1. Dietz HP, Lanzarone V. Levator trauma after vaginal delivery. Obstet Gynecol, 2005; 106:707-711.

Funding NIH R21 HD049818, NIH NICHD/ORWH P50 HD044406 002 **Clinical Trial** No **Subjects** Human **Ethics Committee** Institutional Review Boards of the University of Michigan Medical School **Helsinki** Yes **Informed Consent** Yes

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RAZOR-TYPE DERMATOMES ENABLE QUICK AND THIN VAGINAL DISSECTION WITH LESS BLEEDING IN COLPOCLEISIS

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HYPOTHESIS / AIMS OF STUDY

This is the first report on a novel use of razor-type dermatomes to enable quick and thin vaginal dissection with less bleeding in colpoclesis. Colpocleisis has been regarded as an old-fashioned surgery for pelvic organ prolapse (POP), but it is gaining some popularity in rapidly aging societies as a good option for sexually-inactive elderly patients, especially in those with multiple comorbidities. However, despite the assumed low-invasiveness, colpocleisis sometimes involves long operating time with more bleeding. This is because, in order to get proper tissue fusion, vaginal epithelium must be thoroughly removed, and deeper dissection can damage larger blood vessels. In cases with post-hysterectomy prolapse, vaginal wall tends to be thin and have scars and adhesions with peritoneum; thus, vaginal dissection becomes difficult and unintended opening of peritoneum may occur. To streamline the vaginal dissection process in colpocleisis, we introduced the usage of electric and razor-type dermatomes which are originally used for skin grafting and debridement, and compared operating time, intraoperative bleeding and the thickness of dissection using our procedures versus using scissors.

STUDY DESIGN, MATERIALS AND METHODS

In the dermatome group, 23 women underwent total colpocleisis with vaginal dissection using dermatomes since March 2017; 5 done with electric dermatomes (Zimmer Electric Dermatome, Zimmer Biomet Holdings, Inc.) and razor-type dermatomes (FEATHER Disposable Dermatome, FEATHER Safety Razor Co., Ltd.), 18 done with razor-type dermatomes. In the control group, 20 women underwent total colpocleisis with vaginal dissection using Metzenbaum scissors during 2015 and 2017. All patients were parous sexually-inactive women with post-hysterectomy prolapse.

Under hydrodissection with 1:1,000,000 diluted epinephrine saline, vaginal wall was distended by pulling it by Allis forceps and pressing it by gauzes from behind. Electric dermatomes, set at depth of 0.5 mm and width 2.5 cm were manipulated by a trained plastic surgeon. Razor-type dermatomes were manipulated by a urologist who had no experience with dermatomes. Serial purse-string sutures and perineoplasty were done similarly in both groups. Operating time and intraoperative bleeding were compared between the two groups. Pathology and the thickness of dissection were investigated in vaginal specimens dissected with electric dermatomes, razor-type dermatomes and Metzenbaum scissors. All values were expressed using the mean ± SD and analyzed by non-paired t test. Differences were considered to be significant at $p < 0.05$.

Fig. 1: Razor-type dermatome

RESULTS

Patient demographics and other baseline characteristics between the dermatome group (n=23, mean age 75.7 ± 7.4) and the control group (n=20, mean age 75.2 ± 5.9) showed no significant differences. All patients in the dermatome group and 18/20 patients in the control group underwent concomitant perineoplasty. Both operating time and bleeding significantly decreased in the dermatome group compared to the control group; total operating time including perineoplasty was 53.2 min (SD 9.5) vs. 76.4 min (SD 17.2), operating time of colpocleisis was 35.3 min (SD 10.3) vs. 62.4 min (SD 21.3), and intraoperative bleeding was 15.2 ml (SD 38.0) vs. 62.3 ml (SD 51.3). Hemostasis was not needed after dissection with dermatomes unlike with scissors. None in the dermatome group and 2/20 patients in the control group had unintended peritoneal opening. Pathological investigation revealed that there were significant differences in the thickness of vaginal dissection (minimum to maximum); with electric dermatomes 0.22 mm (SD 0.02) to 0.66 mm (SD 0.29), with razor-type dermatomes 0.58 mm (SD 0.38) to 1.47 mm (SD 0.75), and with scissors 2.46 mm (SD 1.05) to 6.60 mm (SD 2.70). Dissection with scissors often removed not only the epithelium and submucosal layer but also the muscle layer, which was minimal with razor-type dermatomes and never occurred with electric dermatomes. Although electric dermatomes enabled the thinnest and most uniform dissection, it was difficult to press the blade closely to the vaginal wall especially in small prolapse, and razor-type dermatomes or scissors were needed to manage leftover tissues.

Fig. 2: Dissection with electric dermatomes (A), razor-type dermatomes (B) and scissors (C). Scale bar = 1.0 mm

INTERPRETATION OF RESULTS

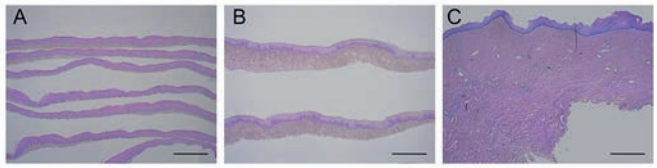
Using dermatomes in vaginal dissection of colpocleisis was helpful to shorten mean operative time by 27 min and to reduce intraoperative bleeding by 47 ml. Dissection was the thinnest with electric dermatomes, but they are more difficult to get used to and are expensive (machine $13,200, disposable blade $54). Razor-type dermatomes enable thinner dissection compared to scissors, easy to handle even for first-timers, and inexpensive (disposable, $1.3).

CONCLUDING MESSAGE

Razor-type dermatomes enable quick and thin vaginal dissection with low cost and to make colpocleisis even less-invasive (less operating time, less bleeding). So, they can be recommended as a desirable tool for colpocleisis, a prolapse operation mainly for frail elderly patients.

FIGURE 1

FIGURE 2



Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee Ethics Committee** of Japanese Red Cross Nagoya First Hospital **Helsinki** Yes **Informed Consent** Yes

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A FIVE-YEAR OUTCOME USING THE ELEVATE™ ANTERIOR KIT FOR GRADES 3 AND 4 CYSTOURETHROCELE REPAIR IN A TERTIARY UROGYNAECOLOGY CENTRE

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HYPOTHESIS / AIMS OF STUDY

The Elevate™ Anterior mesh is designed to correct the anterior vaginal wall defect by providing level 1 and 2 support via a single incision and transvaginal approach. Our institution began using this mesh in 2011. This study aims to examine the objective and subjective outcomes following severe (Grades 3 and 4) cystourethrocele repair using the Elevate™ Anterior kit by a single surgeon in our centre, looking at its safety, efficacy, and associated complication rates.

STUDY DESIGN, MATERIALS AND METHODS

A retrospective review of 83 patients with Grade 3 and 4 cystourethrocele who underwent a single incision transvaginal mesh using the Elevate™ Anterior Kit from 01 October 2011 to 31 December 2012 was conducted. Peri- and post-oper-

ative complications were recorded, and follow up intervals arranged at 1, 6, 12, 24, 36, 48, and 60 months post-surgery. A standardised questionnaire directed at both urinary, pain and recurrence symptoms was used for all patients during each follow up visit. Speculum and vaginal examinations were performed in all patients at each follow up visit to assess for objective cure and for detection of complications, including mesh exposures. The primary outcome was to assess the cure rate defined as a patient with cystourethrocele less than or equal to Grade 1.

RESULTS

Eighty three patients were studied and the mean age was 64.9 years, with 81 (97.6%) patients being menopausal. Majority of these patients (98.8%) had previous vaginal deliveries. Approximately 27% of patients had concomitant urinary symptoms, such as urinary incontinence, urgency and voiding difficulties. Both subjective and objective cure rates at 60 months were 100%. Two (2.4%) intra-operative complications were recorded with 1 having excessive blood loss more than 500 mls, and 1 having rectal perforation during concomitant posterior repair for rectocele. Post-operatively, 3 (3.6%) patients had fever and 1 (1.2%) had voiding difficulty associated with urinary tract infection.

INTERPRETATION OF RESULTS

At 60 months, there were no subjective symptoms of de novo stress or urge incontinence, prolapse symptoms, pelvic pain or dyspareunia. Objective assessment revealed no prolapse recurrences or mesh exposures. All the patients were satisfied after surgery.

CONCLUDING MESSAGE

Our five-year experience with the Elevate™ Anterior kit showed excellent subjective and objective outcomes in patients with severe cystourethrocele and has high patient satisfaction rates with no increased risk in complications such as mesh exposures or pelvic pain. As there were no anterior prolapse recurrences in our study, the Elevate™ Anterior kit has proven its long-term efficacy in achieving optimal treatment outcomes.

Funding Nil **Clinical Trial** No **Subjects** Human **Ethics Committee** SingHealth Centralised Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

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LEVATOR ANI MUSCLE AVULSIONS AND OUTCOMES OF MANCHESTER PROCEDURE

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HYPOTHESIS / AIMS OF STUDY

Anterior compartment pelvic organ prolapse surgery (POP) is a challenge due to high reported recurrence rates. Levator ani muscle (LAM) avulsions have been identified as a risk factor for POP recurrence after surgery, and some vaginal surgeons advocate POP repair with tissue reinforcement using transvaginal meshes in women with avulsions (1) . Recent publications on native tissue repair techniques, such as the Manchester Procedure, have described satisfactory objective and subjective outcomes in cohorts with unknown prevalence of avulsions. Since at least 25 % of women in POP cohorts are likely to have avulsions (2, 3) we question the concept of poorer surgical outcomes in these women. We therefore aimed at evaluating the impact of LAM avulsions on failure rate, anatomical and patient-reported outcomes one year after surgery for primary anterior compartment pelvic organ prolapse (POP) with the Manchester Procedure.

STUDY DESIGN, MATERIALS AND METHODS

A prospective cohort study of 189 women undergoing POP surgery with the Manchester Procedure, a uterus-sparing native tissue repair technique including repair of all three compartments, between October 2014 and January 2017. LAM avulsions were diagnosed prior to surgery by transperineal ultrasound. Intra- and inter-rater reliability between the first author (SO) and an external evaluator (IV) was calculated using Cohen´s Kappa. Women with and without avulsions were compared for one-year postoperative outcomes; failure rate (defined as new POP treatment), POP Quantification (POP-Q) measurements, subjective satisfaction (rated from 1, worsened to 4, cured), postoperative symptom load (Pelvic Floor Distress Inventory Short Form 20 (PFDI-20)), and sexual function (POP/Urinary Incontinence Sexual Questionnaire (PISQ-12)). A composite outcome was the combination of subjective satisfaction with anterior compartment stage 0 – 1. Factors potentially associated with poor postoperative anatomical (anterior compartment stage 2 or above) or symptomatic (PFDI-20 score) outcomes were analyzed using logistic and linear regression analyses.

RESULTS

The prevalence of LAM avulsions was 50.8 %. For the diagnosis of LAM avulsions on transperineal ultrasound, the inter-rater Cohen´s Kappa was 0.82 and the intra-rater Cohen´s Kappa was 0.80, indicating excellent agreement. Failure rate one year after surgery was similar in both groups; 1% (LAM avulsions) vs. 3.2% (intact LAM), p = 0.36. Less women with LAM avulsions tended to obtain POP-Q stage 0-1 in anterior compartment (46.9% vs. 58.1%; p=0.08) and stage 0 in mid-compartment (77.1% vs. 86.0%; p=0.11) but the

between-group differences were not statistically significant. No significant differences between groups were identified for subjective satisfaction nor responses to PFDI-20 or PISQ-12 questionnaires. The composite outcome of subjective satisfaction with anterior compartment stage 0-1 was also similar across groups (36.5% vs 41.9%, p = 0.44). On regression analyses, LAM avulsions were not associated with poor anatomical or symptomatic outcome. Only preoperative anterior compartment stage 3 or above was associated with poor anatomical outcome (p< 0.01, and only preoperative PFDI-20 score with symptomatic outcome (p<0.001).

INTERPRETATION OF RESULTS

LAM avulsions did not impact outcomes at one-year follow-up after the Manchester Procedure for primary anterior compartment POP. Several previous studies in which an association between increased POP recurrence risk and LAM avulsions was found, were performed after isolated anterior compartment repairs. Women with avulsions have larger hiatal areas, a recognised risk factor for POP, and reconstruction of the perineal body as part of the Manchester Procedure will cause a reduction of hiatal dimensions. We therefore believe that the procedure per se explains why outcomes were similar across groups. Our findings imply that women with avulsions may be treated efficiently with native tissue repair techniques as long as thorough repair is performed in all compartments.

CONCLUDING MESSAGE

Failure rate one year after primary anterior compartment POP surgery with the Manchester Procedure for was low for the whole cohort. LAM avulsions did not impact treatment failures, nor anatomical or symptomatic outcomes. Therefore, indepent of LAM avulsions, the Manchester Procedure is a safe and efficient treatment option for primary anterior compartment prolapse.

REFERENCES

1. H. P. Dietz, V. Chantarasorn and K. L. Shek. Levator avulsion is a risk factor for cystocele recurrence. Ultrasound Obst Gyn 2010; 36: 76-80. DOI 10.1002/uog.7678
2. H. P. Dietz and J. M. Simpson. Levator trauma is associated with pelvic organ prolapse. Bjog-Int J Obstet Gy 2008; 115: 979-984. DOI DOI 10.1111/j.1471-0528.2008.01751.x.
3. J. O. L. DeLancey, D. M. Morgan, D. E. Fenner, R. Kearney, K. Guire, J. M. Miller, H. Hussain, W. Umek, Y. Hsu and J. A. Ashton-Miller. Comparison of levator ani muscle defects and function in women with and without pelvic organ prolapse. Obstet Gynecol 2007; 109: 295-302. DOI DOI 10.1097/01.AOG.0000250901.57095.ba.

Funding Institution **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov, www.clinicaltrials.gov, NCT02246387 **RCT** No **Subjects** Human **Ethics Committee** Norwegian Regional **Ethics Committee** (2013/2093) **Helsinki** Yes **Informed Consent** Yes

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CORRELATION OF PELVIC ORGAN PROLAPSE STAGING WITH LOWER URINARY TRACT SYMPTOMS

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HYPOTHESIS / AIMS OF STUDY

Literature has revealed that symptoms of pelvic organ prolapse (POP) are an independent risk of symptomatic overactive bladder. Anterior vaginal wall prolapse is associated with overactive bladder and directly correlated to overactive bladder severity. However, different anterior vaginal wall prolapse stages might cause divergent effects on urinary incontinence. Relationships between POP staging and lower urinary tract symptoms are controversial. We evaluated correlations of POP staging in different compartments with lower urinary tract symptoms (LUTS)

STUDY DESIGN, MATERIALS AND METHODS

From January 2016 to December 2017, 286 consecutive patients with urogynecologic complaints who were referred to our urodynamic unit were recruited into this study. We excluded 33 patients who had a hysterectomy. In total, 252 patients' demographic data, LUTS and POP stages were analyzed. Different stages of different compartments (anterior, cervix and posterior) of POPs according to IUGA and ICS terminology (as standardized in 1996) were re-grouped into four categories as stage 0, 1, 2, and 3 (including stage 4 because of a limited number of patients in stage 4). Pearson correlation coefficient was used to find correlations between different compartments of POP and LUTS (stress urinary incontinence, overactive bladder and voiding difficulty). General linear regression was used to evaluate factors associated with the occurrence of overactive bladder. A p value less than 0.05 was considered as a significant difference.

RESULTS

Only the Pearson correlation of overactive bladder and different compartments of POP were equal to or larger than 0.3 (moderate relationship; anterior vaginal wall was -0.3116, cervix was -0.2954 and posterior vaginal wall was -0.3779 ; all $p < 0.05$). Further, we found that stage 1 of anterior vaginal wall prolapse significantly increased (39.6%) the occurrence of overactive bladder compared to no prolapse. However, posterior compartment prolapse had a lower occurrence of overactive bladder (stage 1 reduced by 35.8%, stage 2 reduced by 31.2%, stage 3 reduced by 58% compared to no posterior vaginal wall prolapse (Table 1).

INTERPRETATION OF RESULTS

Interpretation of results Our results imply that only stage 1 of anterior vaginal wall prolapse is associated with an increase in overactive bladder and posterior compartment prolapse may reduce occurrence of overactive

bladder. Stress urinary incontinence and voiding difficulty had no correlation to any compartment of POP.

CONCLUDING MESSAGE

The correlation between POP with LUTS is weak except for overactive bladder.

FIGURE 1

Table 1. Associated factors correlated to occurrence of overactive bladder

	estimate	95% C.I.	P value
Anterior vaginal wall prolapse			
Stage 1	0.396	0.559~ 0.876	0.0004
Stage 2	0.105	-0.102~ 0.313	0.3205
Stage 3	0.053	-0.215 ~ 0.321	0.7008
Posterior vaginal wall prolapse			
Stage 1	-0.358	-0.579~ -0.137	0.0015
Stage 2	-0.312	-0.52~ - 0.103	0.0034
Stage 3	-0.58	-0.851~- 0.31	0.0001
Cervical prolapse			
Stage 1	0.083	-0.099~ 0.2644	0.37
Stage 2	-0.19	-0.396~ 0.0153	0.0697
Stage 3	-0.157	-0.398 ~ 0.0844	0.2025
Age > 65 years	0.0752	-0.07~0.22	0.3086
Menopause	0.0972	-0.021~ 0.2156	0.1076
Vaginal delivery	-0.0.008	-0.172~ 0.1561	0.9252
18.5 <= BMI <25	0.0635	-0.255 ~ 0.3818	0.6958
BMI => 25	-0.028	-0.137~ 0.0811	0.6181

BMI body mass index

REFERENCES

1. Female Pelvic Med Reconstr Surg. 2014; 20:203-207.
2. Int Urogynecol J. 2013; 24:1645-1650.
3. Int Urogynecol J. 201; 22: 569-575.

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CHARACTERIZATION OF TENSION-FREE VAGINAL MESH SURGERY AND LAPAROSCOPIC SACROCOLPOPEXY BASED ON NATIONWIDE DATABASE IN JAPAN

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HYPOTHESIS / AIMS OF STUDY

Tension-free vaginal mesh (TVM) surgery for pelvic organ prolapse (POP) has fewer variance in the skill and concept of the surgeon compared to the conventional native tissue repair (NTR). It is a minimally invasive procedure with few recurrence and it has spread rapidly in Japan. However, the FDA warning in 2008 concerning potential risk of complications has resulted a headwind against TVM surgery especially in Europe and the United States. In Japan, on the other hand, laparoscopic sacrocolpopexy (LSC) became covered by insurance in 2014. Many reports suggested its potential superiority in incidence of perioperative complications and patient satisfaction compared with TVM surgery. Therefore, the trend of treatment selection has shifted from TVM surgery to LSC. We examined the characteristics of TVM surgery and LSC using Diagnosis Procedure Combination (DPC) database in Japan.

STUDY DESIGN, MATERIALS AND METHODS

Clinical data about female patients undergoing tension-free vaginal mesh (TVM group; n=2388) or laparoscopic sacrocolpopexy (LSC group; n=625) from April 2014 to March 2015 were extracted from DPC database. We compared trends of number performed, age, risk, anaesthesia time, cost, and the rate of adverse events between these groups. Univariate and multivariate analyses were conducted with variables of age, comorbidity, cost and hospital volume.

RESULTS

Among total POP surgery in Japan, the number of cases of TVM surgery reached a peak (about 5,000 cases / year, about 35% of the total) in 2012, turned down after the FDA warning (About 27% of the total in 2014). Meanwhile, the LSC already accounted for about 6% of total in 2014.The average age at the time of surgery was significantly younger in LSC group (median TVM: 71 vs. LSC: 66 years, $p < 0.001$). When compared using Charlson comorbidity index, the number of high risk patient was significantly large in TVM group ($p < 0.05$). In addition, the number of LSC in high volume hospital was more than twice as large as TVM in 2014 ($p < 0.001$). The TVM group showed shorter operation time than LSC group (median 150 vs. 286 min, $p < 0.001$), and the total fee of surgery in TVM group was also significantly lower (median \$6952 vs. \$8414, $p < 0.001$) (Table 1.). We observed no significant difference between the TVM group and the LSC group in perioperative complications other than genitourinary system, however, there was a tendency to require more blood transfusion in the TVM group. Perioperative adverse events of genitourinary tract were frequently observed in the TVM group with significance (5.7 vs. 1.1%, $p < 0.001$), particularly with lower urinary tract symptoms like urethral stenosis urinary retention and dysuria ($p < 0.01$) (Table 2.). All adverse events of the surgery were frequently observed in the TVM group (7.1 vs. 1.9%, $p < 0.001$). In multivariate analysis of perioperative outcomes, the high age significantly associated with increased adverse events and cost. In addition, increased number of coexisting diseases significantly associated with increased cost. High volume hospital had significantly less adverse events and less cost. LSC significantly associated with less adverse events.

INTERPRETATION OF RESULTS

DPC database analysis demonstrated favourable/acceptable outcomes of both TVM and LSC. TVM had significantly more genitourinary adverse events, while it showed a benefit of cost performance both for patients and hospitals.

LSC showed less genitourinary adverse events (e.g. voiding dysfunction), while it (may) required longer operation time. These findings may provide a novel evidence for appropriate choice of the surgical options for POP.

CONCLUDING MESSAGE

These data indicated that that appropriate selection of both operations is important in surgical treatment for POP.

FIGURE 1

Table 1. Operation time, necessary costs and postoperative length of stay

	TVM (n=2,388)	LSC (n=625)	p value
Anesthesia time, min	150 (123-182)	286 (244-336)	<0.001
Total cost, USD	6952 (6281-7740)	8414 (8062-9146)	<0.001
Cost without operation room, USD	2576 (2203-3253)	2585 (2435-3047)	0.007
Postoperative length of stay, days	7 (6-9)	6 (6-7)	<0.001

Table 2. Perioperative complications of the genitourinary

	TVM (n=2,388)	LSC (n=625)	p value
Genitourinary events (total)	136 (5.7)	7 (1.1)	<0.001
Pyelonephritis	6 (0.3)	0 (0.0)	0.21
Ureter stenosis/hydronephrosis	6 (0.3)	0 (0.0)	0.21
Urethral stenosis/retention/dysuria	47 (2.0)	2 (0.3)	0.004
Cervicitis	3 (0.1)	1 (0.2)	0.834
Vaginitis and vulvitis	62 (2.6)	2 (0.3)	<0.001
Intraoperative urinary system injury	11 (0.5)	1 (0.2)	0.288
Intraoperative colorectal injury	2 (0.1)	0 (0.0)	0.649
Others	1 (0.0)	1 (0.2)	0.307

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** The institutional review board and ethics committee of The university of Tokyo approved the current study (approval number, 3501) **Helsinki** Yes **Informed Consent** No

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A RANDOMIZED CONTROLLED TRIAL: LAPAROSCOPIC AND ROBOTIC ASSISTED LAPAROSCOPIC SACROCOLPOPEXY, LONG TERM OUTCOMES

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HYPOTHESIS / AIMS OF STUDY

The sacrocolpopexy is considered to be a gold standard in surgical treatment of apical vaginal prolapse. Minimally invasive approaches specifically reduce morbidity associated with open sacrocolpopexy. When compared to open techniques, laparoscopic and robotic abdominal sacrocolpopexy is associated with less blood loss, shorter lengths of stay, and longer operative times. The present randomized study compares laparoscopic sacropexy (LSC) and robotic assisted sacropexy (RASC) in women with advanced pelvic organ prolapse (POP) to demonstrate the equivalence between the two technique

STUDY DESIGN, MATERIALS AND METHODS

Consecutive patients referred to our tertiary Department of Urology for symptomatic stage >II POP according to the POP-Q classification were prospectively randomized to test the clinical equivalence of RASC and LS, using a predetermined computer generated randomization code. The local ethics committee approved the study . All patients signed an informed consent. Preoperative evaluation included urogynaecological surgery history, evaluation of urinary symptoms (ICS standardization) and sexual activity, clinical examination, urodynamic study. Patients completed self-administered Urinary Distress Inventory Short Form (UDI-6), Incontinence Impact Questionnaire–Short Form (IIQ7), Female Sexual Function Index questionnaire (FSFI). All procedures were performed by 2 senior surgeons, with standardized technique. Surgical technique in laparoscopic and robotic-assisted is the same. Patients were followed up at 1, 3, 6, and 12 months after surgery, and then annually. At each visit, patients underwent clinical examination, evaluation of urinary and sexual symptoms, uroflowmetry with PVR measurement and Patient Global Impression of Improvement (PGI) questionnaire. Furthermore patients completed self-administered UDI-6 and IIQ-7 questionnaires annually and FSFI at 1 and 2 years. All the data present in our database were collected and recorded along the follow up period.The following outcomes were recorded: a) anatomic outcomes, b) functional outcomes c) complications d) global patient perceptions. Then we evaluated the difference between the two groups in terms of hospital stay length, blood loss, operating time. Statistical analysis was performed by using the non parametric Mann-Whitney U test was used for analysis of continuous variables and the categorical data were analyzed by using X2 test. All calculations were performed using IBM-SPSS® version 22.0 (IBM Corp., Armonk, NY, USA, 2013). A twosided p-value

RESULTS

From May 2013 to May 2017, 35 women have been randomized to RASC and 36 to LSC. The mean follow-up was 30.5 months for RASC and 34.05 for LSC. No significant inter-group differences emerged in the pre-operative evaluations of age (mean 64.3 vs 60.18 yrs for RASC and LSC respectively, p=0.06) and BMI (mean 24.59 vs 25.41 kg/m2 for RASC and LSC respectively, p=0.55).The objective success rate was 83% for RASC vs 80.9% for LSC (p=0,6), 87% for RASC vs 81% for LSC (p=0,8) and 100% for RASC vs 96,5% for LSC (p=0,57) for cystocele, rectocele and point c/D repair respectively. Although not significant, operating time was longer for RASC (mean 220 min for RASC vs 174 min for LSC, p=0.11) and intra-operative blood loss was higher in RASC (mean 34 ml for RASC vs 49 ml for LSC, p=0.014). No difference emerged in hospital stays (mean 3.8 days for LSC vs 3.9 days for RASC, p=0.76). Functional results are reported in table 1. No major complications were detected, only 3 grade III complication according to Clavien-Dindo classification has been reported in the LSC group (1 bladder injury and 2 mesh exposure). The subjective success rate was very high, 100% of patients of both groups reported to be "much satisfied" and "very much satisfied" at the PGI-I questionnaire.

INTERPRETATION OF RESULTS

Anatomic success rate was high in both groups, with more improvement in RASC group probably for the best technical characteristics of robotic procedures. Functional outcomes were comparable. These results were confirmed by PGI-I. Our work showed a relatively small increase in operative time in the robotic group, but it was not statistically significant, probably because the operating time in robotic procedure included docking and undocking time. Intraoperative blood loss was low in both groups mostly for RASC, however the statistical difference was not clinically significant. Mean hospital stay was about 4 days in both groups, this result is included in benefits of minimally invasive surgery

CONCLUDING MESSAGE

RASC aims at providing a similar excellent outcome as LSC in terms of anatomical results, satisfaction rate, complications, sexual function and voiding and storage symptoms relief

FIGURE 1

Tab 1. Evolution of urinary symptoms and sexual function after surgery

	Pre operative	Post operative	p	Pre operative	Post operative	p
Voiding Symptoms	31 (88.5)	0	<0.01	34 (94.4)	2 (5.5)	<0.01
Storage Symptoms	26 (74.3)	10 (27.7)	0.013	19 (52.7)	9 (25.0)	0.12
Stress urinary incontinence	3 (8.3)	5 (14.3)	0.1	4 (11.1)	2 (5.5)	0.1
Urge urinary incontinence	5 (14.3)	3 (8.3)	0.1	6 (16.6)	2 (5.5)	0.6
Mixed urinary incontinence	5 (14.3)	0	<0.01	8 (22.2)	4 (11.1)	0.68
Sexual intercourse	33 (94.3)	20 (55.5)	0.008	30 (83.3)	32 (88.8)	0.1
Sexual dysfunctions	13 (36.1)	3 (8.3)	0.016	8 (22.2)	2 (5.5)	0.3

* Significant p-value <0.05

Funding None **Clinical Trial** Yes **Registration Number** NCT02852512 **RCT** Yes **Subjects** Human **Ethics Committee** CEAS Umbria **Helsinki** Yes **Informed Consent** Yes

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MOLECULAR DETERMINANTS OF AFFERENT SENSITIZATION IN THE FACE OF UROTHELIAL BARRIER DYSFUNCTION

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HYPOTHESIS / AIMS OF STUDY

The internal surface of the urinary bladder is lined by the urothelium, a barrier-forming epithelium that restricts the passage of ions and metabolic products from the urine into the bladder interstitium. Urothelial abnormalities, which range from mucosal ulcerations, urothelial ruptures and widening of the space between urothelial cells to denuded epithelium, have been reported in patients with interstitial cystitis/bladder pain syndrome (IC/BPS). We previously showed the overexpression of the tight-junction associated protein claudin-2 (Cldn2) in the rat urothelium reproduces the cardinal features of IC/BPS including increased urothelial permeability to ions, inflammation in the bladder mucosa and lamina propria, increased voiding frequency and pelvic allodynia [1, 2]. These changes were associated to an increase in the excitability (sensitization) of bladder sensory neurons with tetrodotoxin-sensitive (TTX-S) action potentials, which are considered of A delta origin.

Voltage-gated Na+ and K+ channels are responsible for the generation, propagation and termination of action potentials in neurons. We put forth the hypothesis that the hyperexcitability seen in TTX-S sensory neurons from rats with increased urothelial permeability reflects changes in the activity of voltage-gated Na+ and K+ channels.

STUDY DESIGN, MATERIALS AND METHODS

Female Sprague-Dawley rats (250-300 g) were used throughout. In situ transduction of umbrella cells was accomplished via direct intravesical instillation of adenovirus coding for GFP (AdGFP) or Cldn2 (AdCldn2). Bladder afferent neurons were labeled by injecting DiI in the bladder wall. Lumbosacral (L6-S2) dorsal root ganglion (DRG) neurons were isolated with collagenase/trypsin and plated on coverslips coated with ornithine and laminin. Taqman probes were employed to assess gene expression by qPCR in acutely isolated bladder sensory neurons. Neuronal excitability and ion channel function was assessed with the patch-clamp technique and a set of pharmacological tools.

RESULTS

Isolectin IB4 conjugated to FITC (IB4) was used to discriminate bladder sensory neurons of C- and A delta origin. Patch-clamp studies showed that 100% (0/15) of the bladder sensory neurons labeled with IB4 have TTX-resistant (TTX-R) action potentials. Thus, to assess gene expression in sensory neurons with TTX-S action potentials (A delta origin), we collected IB4(-) bladder sensory neurons under fluorescent light with an oil-filled glass pipette plugged to a nanoinjector. We examined gene expression for voltage-gated K+ channel subunits Kv1.1, Kv2.1, Kv2.2, Kv3.4, Kv4.1, Kv7.2, Kv7.3, Kv9.1 and the large-conductance Ca2+-activated K+ channel (BK), and for TTX-S voltage-gated Na+ channel subunits Nav1.1, Nav1.3, Nav1.6 and Nav1.7, which are known to be present in A delta sensory neurons. Gene expression analysis showed a significant upregulation of mRNA levels for subunits Kv2.2 and Kv9.1 in IB4(-) bladder sensory neurons from rats with bladders transduced with AdCldn2, when compared to controls (AdGFP). Kv2.2 is a pore forming subunit expressed in somas and axons that constitute the neuronal outward delayed rectifier K+ (Ik) current and associates with silent Kv subunits (9.1, 9.2, 9.3). No significant difference in mRNA expression for Nav subunits was observed between bladder sensory neurons harvested from rats transduced with AdGFP or AdCldn2.

To determine whether the hyperexcitability seen in sensory neurons with TTX-S action potential from rats transduced with AdCldn2 reflects changes in the activity of Kv2.2/9.1 channels, we measured whole-cell K+ currents before and after treatment with guangxitoxin-1E (GxTx-1E), a selective blocker of Kv2 channels. GxTx-1E-sensitive currents were 58+/-15 pA/pF (n=14) and 8+/-2 pA/pF (n=16) in sensory neurons from rats transduced with AdCldn2 and AdGFP, respectively ($p<0.01$). Moreover, we observed a 3-fold increase in TTX-S Na+ currents in sensory neurons from rats transduced with AdCldn2, when compared to controls. Significantly, GxTX-1E reduced repetitive firing in response to electrical stimulation in IB4(-) neurons from rats transduced with AdCldn2 (Fig.1).

Figure 1. Guanxitoxin-1E inhibits repetitive firing of bladder sensory neurons from rats transduced with AdCldn2. A and B, Representative tracings of action potential firing in response to suprathreshold electrical stimulation for bladder sensory neurons from rats transduced with AdGFP (A) or AdCldn2 (B) before (upper panel) and after (lower panel) the addition of 100 nM GxTX-1E. C, Stimulus response relationships for bladder sensory neurons from rats transduced with AdGFP or AdCldn2. Action potentials were evoked by the injection of depolarizing current pulses. The number of spikes evoked in response to stimuli of increased intensity for each neuron were computed before and after GxTX-1E (100 nM)(n = 22–27, * $p<0.01$ GFP vs Cldn2, # $p<0.05$ and ## $p< 0.01$ for GFP or Cldn2 +/- GxTX-1E, Student's t-test).

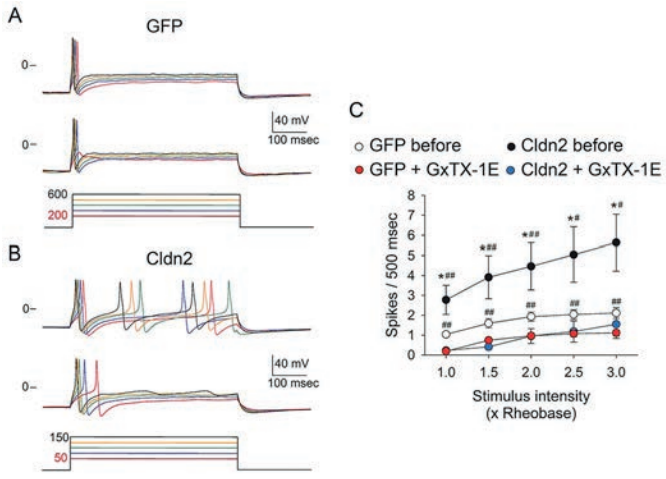
INTERPRETATION OF RESULTS

Our data indicate that urothelial barrier dysfunction increases the expression and activity of Kv2.2 and the activity of TTX-S voltage-gated Na+ channels in bladder sensory neurons with TTX-S action potentials. These results suggest that increased activity of voltage-gated Na+ and K+ channels contributes to the hyperexcitability we see in this population of bladder sensory neurons from rats transduced with AdCldn2. Current-clamp experiments showed that inhibition of Kv2.2 by GxTX-1E significantly reduced action potential firing in response to suprathreshold stimulation in this population of bladder sensory neurons. This result is in good agreement with previous electrophysiological studies that showed that Kv2 activity is necessary for sustained firing of hippocampal pyramidal, trapezoid body and substantia nigra dopaminergic neurons.

CONCLUDING MESSAGE

Although aberrant bladder afferent signaling is considered to play an important role in symptoms generation in IC/BPS, little is known about the sensory pathways that are involved in this process and the mechanisms that promote afferent sensitization. We previously showed that the overexpression of Cldn2 in the rat urothelium reproduces the cardinal features of IC/BPS by a mechanism that involves A delta fiber afferents [2]. The data presented in this report suggest that the functional changes seen in rats transduced with AdCldn2 reflect in part changes in ion channels that control neuronal excitability. These findings provide novel insights into the molecular mechanism that cause neuronal hyperexcitability in the face of urothelial barrier dysfunction and reveal novel potential targets to treat hypersensitive bladder disorders.

FIGURE 1



REFERENCES

1. Montalbetti, N., et al., Increased urothelial paracellular transport promotes cystitis. Am J Physiol Renal Physiol, 2015. 309(12): p. F1070-81.
2. Montalbetti, N., et al., Urothelial Tight Junction Barrier Dysfunction Sensitizes Bladder Afferents. eNeuro, 2017. 4(3).

Funding Dialysis Clinic, Inc **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** IACUC

456 www.ics.org/2018/abstract/456

THE UROTHELIUM HAS TWO DISTINCT ATP RELEASE MECHANISMS THAT CONTRIBUTE DIFFERENTLY TO BLADDER FUNCTION

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HYPOTHESIS / AIMS OF STUDY

The importance of ATP release from the bladder epithelium (urothelium) in bladder physiology/pathophysiology has been a hotly debated topic in the field of urology. Previous research has revealed that urinary ATP levels are elevated in patients suffering from conditions such as overactive bladder (OAB), Painful Bladder Syndrome/Interstitial Cystitis (PBS/IC), or bacterial cystitis, suggesting a role for ATP in bladder pathology. It has also been demonstrated that alteration of basal levels of urinary ATP, either by inhibiting endogenous ecto-ATPases in the bladder lumen or by introducing an exogenous ATPase into the bladder lumen, can modulate reflex bladder activity in the rat. This suggests that urinary ATP also plays an important role in the physiological control of micturition. It has become clear, then, that differ-

ences must exist in urinary purinergic signaling that account for ATP's dual role in bladder physiology/pathophysiology.

It has been recently confirmed that the urothelium releases ATP from both vesicular and non-vesicular (pannexin channels) mechanisms. It is unclear, however, if these two release mechanisms mediate different downstream events. Research involving other cell types that express both ATP release mechanisms, such as the retinal epithelium, suggests that vesicular and non-vesicular ATP release mechanisms are activated by separate stimuli, with physical stimuli such as stretch activating ATP release through pannexin channels and simulation of Toll-like receptors (TLRs) activating vesicular (lysosomal) release. With this information in mind, we hypothesized that the same separation exists in the urothelium and that distinct ATP release mechanisms may mediate different downstream events. To this end we examined two pathways known to cause ATP release from the urothelium: the stimulation of urothelial α3* nicotinic receptors (nAChRs) with cytisine and the activation of TLR4 with bacterial lipopolysaccharides (LPS). Both of these stimuli have been previously shown to excite bladder reflexes in vivo in addition to causing ATP release, however LPS also induces bladder inflammation, while α3* nAChR stimulation does not.

STUDY DESIGN, MATERIALS AND METHODS

The in vitro portion of our study used immortalized normal human urothelial cells (TRT-HU1) at passage number 25-35, plated in 96-well, white walled, clear bottomed culture plates at a density of approximately 1x106/ml. Cells were used for experiments after 1-2 days when they had reached 50-70% confluency.

To measure extracellular ATP concentrations, the media supporting the cells was first replaced with 50µl of Krebs solution alone or antagonists (2X final concentration) and incubated at 37°C for 20 minutes. 50µl of Krebs (for non-stimulated controls) or agonists (2X final concentration) was then added and the plate incubated again for 20 minutes (cytisine) or 1 hour (LPS) at 37°C. 50µl of the luciferin/luciferase assay mix (Sigma-Aldrich) was then added and the luminescence measured using a plate-based luminometer (Victor3). Luminescence readings were converted to ATP concentrations using known concentrations of ATP dissolved in solutions containing the same concentrations of the drugs used in the study to correct for any interference they might have on the assay.

To measure extracellular acid phosphatase activity (as a measure of lysosomal exocytosis), cells were incubated in agonists/antagonists as described above. After incubation, 50µl samples of the extracellular fluid were taken from each well and tested for acid phosphatase activity using the commercially available colorimetric kit from Sigma-Aldrich. At the end of each experiment, cells in each well were lysed using RIPA buffer and protein concentrations determined by BCA assay as a measure of cell number with which to normalize the acid phosphatase measurements.

To determine the influence of each ATP release mechanism on bladder function, we measured contractile activity in an in vitro rat bladder strip setup. Bladders were removed from female Sprague Dawley rats, cut into strips longitudinally, and attached to a force displacement transducer in a tissue bath containing oxygenated Krebs solution at 37°C. Agonists and antagonists were bath applied and changes in basal tone and spontaneous contraction amplitude recorded.

RESULTS

Stimulation of TRT-HU1 cells with the α3* nicotinic agonist cytisine (100µM) increased extracellular ATP concentrations 26.1 ± 3.1% after 20 minutes. This increase was significantly diminished after pretreatment with the pannexin channel antagonist Brilliant Blue FCF (BB-FCF, 100µM) but not by glycyl-L-phenylalanine 2-naphthylamide (GPN, 20µM), which destroys lysosomes. Stimulation of TRT-HU1 cells with the TLR4 agonist LPS (from O111:B4 E. coli, 100µg/ml) also increased extracellular ATP by 16.6 ± 1.3% after 1 hour. This increase blocked by pretreatment with GPN (1.2 ± 1.9% increase), but was enhanced by pretreatment with BB-FCF (30.8 ± 2.1% increase) (Figure 1).

Stimulation of TRT-HU1 cells with LPS also increased extracellular concentrations of acid phosphatase by 63.5 ± 25.2%. This release was blocked after pre-incubation of the cells with GPN. Cytisine, conversely, did not increase extracellular acid phosphatase concentrations.

Rat bladder strips exhibited increased basal tone and increased amplitude of spontaneous contractions following stimulation with LPS (AUC: 112.1 ± 17.6% increase). This response was blocked by pre-incubation with GPN, but potentiated after Brilliant Blue FCF. LPS-induced increases were also blocked by apyrase (2U/ml), an ATPase, indomethacin (10µM), a COX inhibitor or removal of the urothelium. Cytisine had no effect on detrusor contractions, even at twice the dose that elicits ATP release (200µM).

INTERPRETATION OF RESULTS

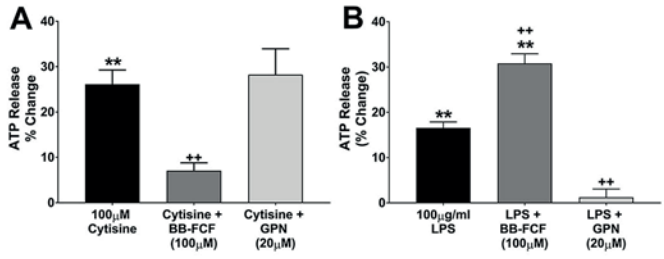
Stimulation of urothelial cell cultures with either cytisine or LPS significantly increased extracellular ATP, however cytisine-induced ATP release was blocked using a pannexin channel antagonist, while LPS-induced release was not. LPS-induced ATP release was prevented following destruction of lysosomes, indicating that LPS causes ATP release through lysosomal exocytosis. This was confirmed by measuring extracellular acid phosphatase concentrations; LPS increased the release of lysosomally-stored acid phosphatase, while cytisine did not. LPS stimulation of bladder strips induced increases in basal tone and bladder contraction amplitude which were blocked by incubation with apyrase or removal of the urothelium, indicating that release of urothelial ATP mediated this effect. This effect was also blocked by indomethacin, suggesting that LPS-induced ATP release induces prostaglandin synthesis. Cytisine did not alter detrusor activity, even at concentrations higher than those that caused ATP release. Because ATP release in response to intravesical cytisine has been previously shown to cause bladder hyper-

activity in vivo, we conclude that pannexin-mediated ATP release mediates its effects by either directly or indirectly stimulating afferent nerves, but does not activate the same pro-inflammatory pathways stimulated by LPS.

CONCLUDING MESSAGE

This study provides the first evidence that urothelial ATP release can mediate separate downstream effects on bladder function depending on the mechanism of its release. These exciting results raise the possibility that the physiological and pathophysiological roles of urinary ATP can be separated based on the mechanism of release. Although the complete cellular pathways involved in these phenomena are unclear, we believe this research is an excellent first step in developing of treatments for bladder dysfunction that specifically target the pathological role of urinary ATP, while sparing any physiological role ATP may play in normal micturition.

FIGURE 1



Funding K01DK106115 & R03DK114492 (JMB) **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** Institutional Care and Use Committee University of Pittsburgh

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A LOW-CARBOHYDRATE DIET PROLONGS VOIDING FUNCTION AND WEAKENS DETRUSOR MUSCLE CONTRACTION IN RATS

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HYPOTHESIS / AIMS OF STUDY

While the number of obese individuals is increasing owing to the Westernization of dietary habits all over the world, many people undertake diet programs. Among the most popular diet programs in recent years, "low-carbohydrate diet (LCD)" is one of the most prevalent. Some people achieved weight loss using this method; however, in a study conducted on more than 40,000 women in Sweden, the group of individuals who were on carbohydrate restricted diets developed an increased risk of experiencing cardiovascular disease and sudden death. These individuals often have such risks and lower urinary tract dysfunction. In this study, we pharmacologically investigated the influence of LCD on lower urinary tract function in rats to try and elucidate the mechanism of development of lower urinary tract disorders.

STUDY DESIGN, MATERIALS AND METHODS

We divided 12-week-old female Wistar-ST rats into the control and LCD groups (n = 8 in each group). Rats in the control group were fed a CLEA rodent diet CE-2. On the other hands, rats in the LCD group were raised with a feed in which carbohydrates were replaced with milk casein. Each diet was calculated in similar caloric intake. After 4 weeks, the voiding function and detrusor muscle contraction were evaluated. Cystometrography (CMG) was performed to assess the voiding interval and intravesical pressure. Detrusor muscle contraction was measured via isometric tension using bladder tissue. Contraction was induced by carbachol (10−10 to 10−4 M) and electrical field stimulation (EFS; 1−64 Hz). Moreover, a muscarinic receptor antagonist was used. Real-time PCR was used to examine variations (muscarinic receptors and Rho associated coiled-coil containing protein kinases) in the expression of mRNA in the excised bladder tissue.

RESULTS

The body weight of the rats in the LCD group significantly decreased from one week after LCD administration to 4 weeks. Based on the CMG (80 μL/min) results (Figure A), LCD resulted in a significant prolongation of the voiding interval (LCD group: 1154.5 ± 324.5 sec., control group: 673.5 ± 99.8 sec., Figure B). Intravesical pressure did not differ significantly between the groups (LCD group: 41.6 ± 11.3 cmH2O, control group: 55.0 ± 8.6 cmH2O, Figure C). In contrast, rats on LCD showed a significantly weaker detrusor muscle contractile force in response to carbachol at 10-6 to 10-4-M concentrations (LCD group: 122.8 ± 36.3 N/g, control group: 367.2 ± 158.3 N/g, Figure D). Similarly, rats on LCD showed a weaker contractile force in response to EFS at 2–64 Hz (LCD group: 115.9 ± 9.1 N/g, control group: 357.7 ± 82.6 N/g, Figure E). Adding a muscarinic receptor antagonist did not cause significant differences in the contractile force in response to EFS between the control and LCD groups. The mRNA expression levels of muscarinic receptors (M2 and M3) were significantly lower in the LCD group than in the control group. Rho associated coiled-coil containing protein kinase 2 (ROCK-2) mRNA expression was also significantly lower in the LCD group than in the control group.

INTERPRETATION OF RESULTS

Our studies showed that LCD could alter the voiding function and detrusor muscle contraction in rats. Interestingly, LCD resulted in the prolongation of the voiding interval. LCD also weakened detrusor muscle contraction in response to carbachol and EFS, though the intravesical pressure as per CMG did not change significantly between the groups. LCD resulted in a decrease in not only M2 and M3 mRNA, but also ROCK-2 mRNA expression. We believe that the down-regu-

lated M2, M3, and ROCK-2 mRNA led to weakened detrusor muscle contraction.

CONCLUDING MESSAGE

Excessive diet or malnutrition might result in an underactive bladder by decreasing the response of the muscarinic receptors and urinary bladder smooth muscle contractility. Effects of LCD on rats may be induced in a short period of 4 weeks and may be useful as a new under-activity bladder model.

FIGURE 1

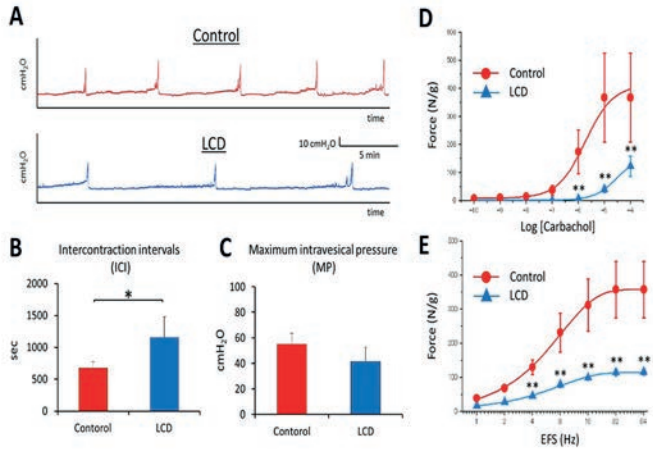

Figure (A-C) Cystometrography after 4 weeks of low-carbohydrate diet (LCD) administration. (A) Representative cystometrograms during intravesicular infusion of saline in the control and LCD groups. (B) Results of the intercontraction intervals (ICI) analysis. (C) The maximum intravesical pressure (MP) in each group. (D-E) Detrusor muscle contraction was measured based on isometric tension using bladder tissue. (D) Carbachol-induced contraction curve for rat bladder strips, showing the contractile effect of increasing concentrations of carbachol (10^{-10} to 10^{-4} M) on bladder strips. (E) Electrical field stimulation (EFS)-induced contraction curve for rat bladder strips, showing the contractile effect of increasing hertz of EFS (1–64 Hz) on bladder strips. Each bar indicates mean ± standard error. *$P < 0.05$, **$P < 0.01$

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THE UROTHELIAL FIBROGENESIS AND INFLAMMATION CYTOKINES IN PATIENTS OF IC/BPS WITH DIFFERENT CLINICAL PHENOTYPES AND SYMPTOM SEVERITY

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HYPOTHESIS / AIMS OF STUDY

Previous studies showed unhealthy urothelium inflammation in interstitial cystitis/bladder pain syndrome (IC/BPS). Bladder wall fibrosis was also noted in IC/BPS, especially in the patients with Hunner's lesion. The aim of current study is to investigate the urothelial fibrogenesis and inflammatory cytokines in patients with IC/BPS.

STUDY DESIGN, MATERIALS AND METHODS

The patients with IC/BPS who were admitted for cystoscopic hydrodistention were recruited. The symptoms severity was investigated with Interstitial Cystitis Symptoms and Problem Index (ICSI and ICPI), O'Leary-Saint symptom score (OSS), Visual Analogue Scale for pain (VAS) and cystometric bladder capacity (CBC). The patients were classified into IC/BPS with Hunner's lesion (HIC) and non-Hunner's lesion IC/BPS (NHIC) groups according to the cystoscopic findings. Random cold-cup biopsies of the posterior bladder wall were obtained during hydrodistention. Western blotting with quantification was used to investigate the fibrogenesis cytokine transforming growth factor beta (TGF-β), fibroblast growth factor receptor (FGFR) 3 and 4 expression in the specimens. The urothelial inflammatory cytokines, including interleukin-1β (IL-1β), macrophage inflammatory protein 2 (MIP-2), intercellular adhesion molecule 1 (ICAM-1) were also investigated with western blotting. Bladder specimens from female patients with stress urinary incontinence were also obtained for western blotting and were considered as control subjects.

RESULTS

Totally 24 control subjects, 51 non-ulcer IC/BPS and 23 ulcer IC/BPS were enrolled. The patients with non-ulcer IC/BPS was younger than ulcer IC/BPS and control subjects. The urothelium TGF-β was significantly higher in total patients with IC/BPS than that in control subjects, especially in the HIC patients. The urothelium expression of FGFR3 and FGFR4 were significantly higher in control subjects (Table 1). The FGFR3 expression in the urothelium was significantly correlated to FRGR4 (r=0.856, p<0.001), and MIP-2 (r=0.327, p=0.001). The urothelial ICAM-1 expression was significantly correlated to ICSI (r= 0.380, p=0.005), ICPI (r=0.306, p<0.024), OSS (r=0.357, p=0.008) and VAS (r=0.322, p=0.014).

INTERPRETATION OF RESULTS

Current study revealed increased fibrogenic cytokine TGF-β in human IC/BPS urothelium. The FGFR, which was associated with tissue healing, was significantly decreased in IC/BPS bladder. Our data suggest increased fibrosis activity and impaired tissue healing in the urothelium may involve in the IC/BPS pathogenesis. The increased urothelial ICAM-1, which was well known for its role in inflammation process, also might impact the pathogenesis and correlate to the IC/BPS clinical symptoms.

CONCLUDING MESSAGE

Our data suggest abnormal fibrogenic activity, impaired tissue healing and increased inflammatory cytokines may involve in the pathogenesis of IC/BPS.

FIGURE 1

Table 1. The urothelial fibrogenic and inflammatory cytokines expression in patients with IC/BPS and control subjects.

	(A)Control N=24	(B) NHIC N=51	(C)HIC N=23	*P* value	Post hoc
FGFR3	0.09±0.15	0.03±0.04	0.02±0.02	**0.010**	AvsB=0.033 AvsC=0.020 BvsC=0.789
FGFR4	0.16±0.20	0.07±0.08	0.06±0.05	**0.002**	AvsB=0.008 AvsC=0.008 BvsC=0.837
IL1-β	0.06±0.06	0.08±0.08	0.05±0.06	0.167	AvsB=0.443 AvsC=0.917 BvsC=0.223
MIP-2	0.11±0.18	0.25±0.31	0.20±0.17	0.088	AvsB=0.089 AvsC=0.523 BvsC=0.688
ICAM1	0.09±0.17	0.21±0.42	0.77±0.65*	**0.000**	AvsB=0.582 AvsC=0.000 BvsC=0.000
TGFβ	0.22±0.17	0.51±0.48	0.79±0.69*	**0.001**	AvsB=0.066 AvsC<0.001 BvsC=0.075

NHIC: IC/BPS patients without Hunner's lesion; HIC: IC/BPS patients with Hunner's lesion; TGF-β: transforming growth factor beta; FGFR: fibroblast growth factor receptor; IL-1β: interleukin-1β; MIP-2: macrophage inflammatory protein 2 (MIP-2), ICAM-1: intercellular adhesion molecule 1

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Research **Ethics Committee**, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation **Helsinki** Yes **Informed Consent** Yes

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EFFECTS OF LOW INTENSITY EXTRACORPOREAL SHOCKWAVE THERAPY ON INFLAMMATORY MEDIATORS AND CENTRAL SENSITIZATION ON CAPSAICIN INDUCED NONBACTERIAL PROSTATITIS MODEL IN RATS

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HYPOTHESIS / AIMS OF STUDY

Low energy shock wave therapy (LESWT) has been suggested to attenuate inflammatory condition and reduce somatic pain. Recently, several studies demonstrate that LESWT significantly improve pain, QoL, and voiding conditions in patients with nonbacterial prostatitis /CPPS comparison to the placebo treated group. Previously We demonstrated that intra-prostatic capsaicin injection activates COX2, NGF and other inflammatory mediator expression in the prostate and induces prostatic pain. Low energy ESWT could inhibit the capsaicin induced inflammation and reduce prostatic pain in a dose dependent fashion (2017 ICS Florence). In clinical practice, we observe some patients with prostatitis also induced voiding dysfunction and unstable bowel habits, however, the mechanisms remained unclear. It has been suggested that persistent afferent (sensory) input from affected organs is important to the maintenance of pain and hypersensitivity. Central sensitization might lead to persist pain even the inflammatory condition in primary organ is subsided. We hypothesize that L-ESWT might attenuate the NGF(nerve growth factor) and related neurotrophin and inflammasone expression in spinal cord level.

STUDY DESIGN, MATERIALS AND METHODS

All experimental procedures were performed in accordance with institutional guidelines and approved Institutional Animal Care and Use Committee before the study. Adult male S.D. rats were injected with vehicle or capsaicin (10 mM, 0.1 cc) into the prostate. Right after injection, various numbers of shock wave (0, 100, 200 or 300 shocks; 0.12 mJ/mm2) were applied into the prostate. Three days after LESWT, the L6 and S1 spinal cord and dorsal root ganglion(DRG) at the level of L6 spinal were removed for histology, COX-2, NGF, BDNF (brain-derived neurotrophic factor) expression by using immunohistochemical staining. Western blot analysis was used to determine the relative protein expressions. The prostate and L6 and S1 spinal cord were removed three days after shock wave therapy for western blot analysis of NGF, BDNF, TRPV1 and COX-2 expression.

RESULTS

Capsaicin injection into prostate induced inflammatory cells accumulation in L6 level dorsal root ganglion but not L6 or S1 spinal cord. Significant increase in the number of Cox-2, NGF and BDNF-immunoreactive (IR) cells in the L6 DRG compared with vehicle injection (Fig.1). The capsaicin-induced dorsal root gandlion inflammation was dose dependently ameliorated by LESWT. On day 3 LESWT decreased COX-2(+) cell accumulation in 100, 200 and 300 shockwave groups (21.3%, 58.7%, and 21.4% reductions, repectively) (Fig. 1). The decrement was significant in 200 shock wave group but not in 100 and 300 shock wave group. The neurotrophin IR cells in L6 DRG increased with time (372% for NGF and 434% for BDNF, Fig 1). LESWT also decreased the neurotrophin IR cells (NGF, 30.2%, 65.2%, and 25.3% reductions; BDNF 102%, 55.9% and 17.8% reductions, respectively in 100, 200 and 300 shockwave groups)but was mostly significant in 200 and 300 shock wave group (p=0.001). In western blot analysis, LESWT could also downregulate expression of NGF, BDNF, TRPV1 and COX-2 expression, which was identical to the immunohistochemical finding. (Fig.2)

INTERPRETATION OF RESULTS

The capsaicin induced prostatitis model can also increase COX-2 produced by the inflammatory responses in the dorsal root ganglion tissues and affect the production of NGF and BDNF in DRG. The effect of LESWT on prostate could not only decrease prostatic inflammation but also have effect on referred central nerve system in a dose dependent fasion, which showed less significant effect at the dose of100 shock waves, but more promising at the dose of 200 and 300 shock waves.

CONCLUDING MESSAGE

Intraprostatic capsaicin injection activates COX2, NGF and related inflammasone expression in the L6 level dorsal root ganglion. LESWT at prostate could also inhibit the capsaicin induced COX-2 and modulate neurotrophin expression at central nervous systems in a dose dependent fashion. This finding suggests a potential clinical benefit of LESWT at the optimal dose for ameliorate chronic pain and its associated central sensitization.

FIGURE 1

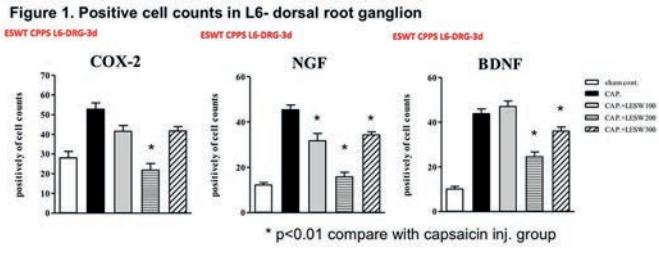
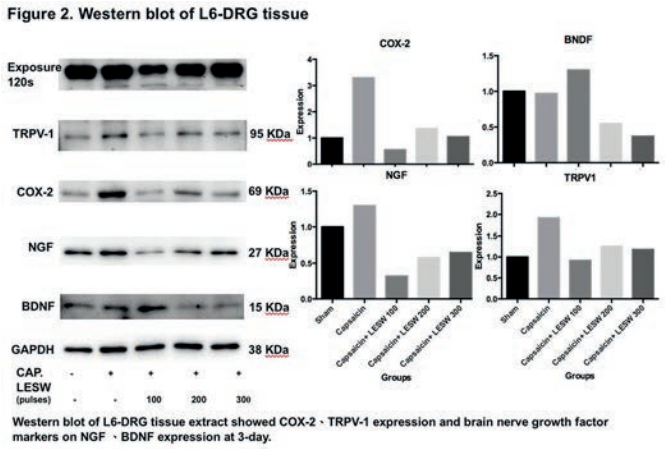


FIGURE 2



REFERENCES

1. Wang H-J, Lee W-C, Tyagi P, Huang C-C, Chuang Y-C. Effects of low energy shock wave therapy on inflammatory moleculars, bladder pain, and bladder function in a rat cystitis model. Neurourology and Urodynamics. 2017;36: 1440–1447. https://doi.org/10.1002/nau.23141

Funding Kaohsiung Chang Gung Memorial Hospital (CMRPG8F1591) and Ministry of Science and Technology **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** Kaohsiung Chang Gung Memorial Hospital Institutional Animal Care and Use Committee

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SERUM C-REACTIVE PROTEIN LEVEL IS NOT ASSOCIATED WITH THE PROSTATIC INFLAMMATION BUT OVERACTIVE DETRUSOR IN PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA

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HYPOTHESIS / AIMS OF STUDY

Chronic prostatic inflammation is one of the significant factors in the exacerbation of the severity of lower urinary tract symptom (LUTS). Various methods have been used to assess the magnitude of prostatic inflammation. It was reported that the serum C-reactive protein (CRP) level was associated with the severity of LUTS, particularly storage symptoms in patients with benign prostatic hyperplasia (BPH) [1]. However, it is unclear whether the CRP level truly reflects the magnitude of prostatic inflammation. Our previous report demonstrated that the number of high endothelial venule (HEV)-like vessels was a remarkable histological marker that can be used to quantify the magnitude of chronic inflammation, and we showed that chronic prostatic inflammation ex-

acerbated the severity of LUTS particularly voiding dysfunction by using urodynamic study (UDS) [2].

Here we assessed the relationship between the magnitude of chronic prostatic inflammation and the serum CRP level. By using UDS parameters, we also evaluated the impact of CRP on the severity of LUTS.

STUDY DESIGN, MATERIALS AND METHODS

We examined the tissue specimens obtained from 121 BPH patients who underwent transurethral resection of the prostate (TURP) or holmium laser enucleation of the prostate (HoLEP) and pre-surgery measurement of the serum CRP level. The tissue specimen were immunostained for CD34 and MECA-79 to determine the HEV-like vessel number. Patients with any type of pre-operative bacterial infection and patients taking an anti-inflammatory drug such as NSAIDs or steroids were excluded. We quantified the magnitude of prostatic inflammation histologically by determining the number of HEV-like vessels in each specimen, and we evaluated the relationship between the number of HEV-like vessels and the serum CRP level. We divided the patients into two groups based on the median serum CRP level (0.05 mg/dL) and compared the groups' clinical parameters: the International Prostate Symptom Score (IPSS), the Overactive Bladder Symptom Score (OABSS), prostatic volume, serum prostate-specific antigen (PSA), and uroflowmetry and pressure-flow study.

RESULTS

There was no correlation between the number of HEV-like vessels and the serum CRP level (correlation coefficient= - 0.038, p=0.388; Fig. 1). The serum CRP levels were well correlated with each item of the OABSS (daytime frequency score: correlation coefficient= 0.520, p=0.009; nighttime frequency score: correlation coefficient= 0.425, p=0.027; urgency score: correlation coefficient= 0.477, p=0.014; urgency urinary incontinence score: correlation coefficient=0.593, p=0.002). The proportion of detrusor overactivity (DO) in the higher-CRP group was significantly higher than that of the lower-CRP group (65.0% vs. 34.3%, p=0.009; Fig. 2). Chronic prostatic inflammation assessed by the number of HEV-like vessels was not associated with the proportion of DO. Higher CRP level was significantly associated with the existence of DO in univariable and multivariable analyses (univariable: odds ratio: 3.550, p=0.011; multivariable: odds ratio: 6.450, p=0.009).

INTERPRETATION OF RESULTS

We demonstrated that the serum CRP level was not a marker of chronic prostatic inflammation, but the serum CRP level was significantly associated with storage dysfunction. It is unclear how CRP is associated with storage dysfunction. We hypothesized that CRP itself might be related to aggravating factors of OAB. Further studies are required to determine the relationship between CRP and storage dysfunction.

CONCLUDING MESSAGE

To the best of our knowledge, this is the first report to demonstrate that the serum CRP level is not associated with the magnitude of chronic prostatic inflammation, but that the serum CRP level is significantly associated with the severity of storage dysfunction by using UDS parameters.

FIGURE 1

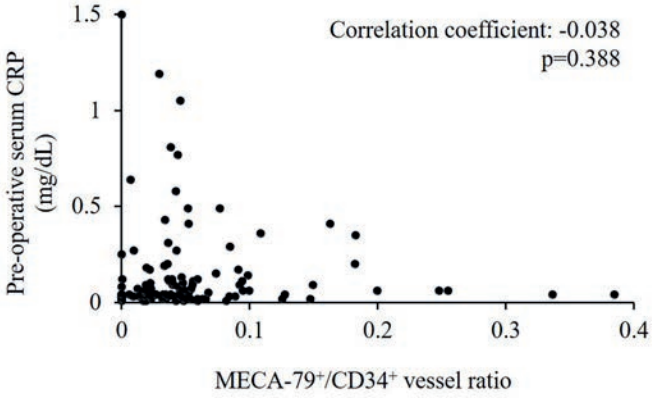
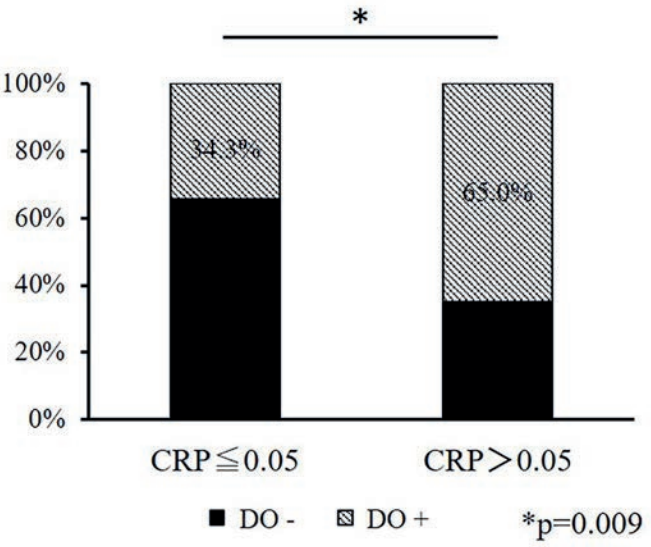


FIGURE 2



REFERENCES

1. Hung SF et al. Increased serum C-reactive protein level is associated with increased storage lower urinary tract symptoms in men with benign prostatic hyperplasia. PLoS ONE 2014; 9: e85588.
2. Inamura S et al. Appearance of high endothelial venule-like vessels in benign prostatic hyperplasia is associated with lower urinary tract symptoms. Prostate. 2017 77: 794-802.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** The **Ethics Committee** of the Faculty of Medical Sciences, University of Fukui, Japan **Helsinki** Yes **Informed Consent** Yes

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CHRONIC STRESS INCREASES PLASMATIC AND URINARY LEVELS OF NGF LEADING TO INCREASED BLADDER PAIN AND BLADDER HYPERACTIVITY. EXPERIMENTAL STUDY IN THE RAT.

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HYPOTHESIS / AIMS OF STUDY

A relationship between chronic stress and bladder pain syndrome/ interstitial cystitis (BPS/IC) is well established. Patients with BPS/IC have symptom exacerbation during stress events while at experimental level the Water Avoidance Stress (WAS) was shown to increased bladder pain through a mechanism dependent of intense stimulation of alfa1A adrenoceptors. One other hand, clinical studies linked BPS/IC and urinary nerve growth factor (NGF). Recent meta-analysis showed that BPS/IC courses with increased levels of NGF in the urine and that treatment with antibodies anti-NGF have a beneficial symptomatic effect on in women with that condition.

In this study, we hypothesized that in animals subjected to chronic stress there is an increase in NGF expression and that the high affinity TrkA blockade will prevent alterations in the bladder function.

STUDY DESIGN, MATERIALS AND METHODS

Adult female Wistar rats (200–250 g) were submitted to WAS test only or to WAS while receiving orally with the TrkA antagonist GW441756, 58µg/kg/day (Biotechne). Sham animals were used as controls. Visceral pain behavioral tests and mechanical pain threshold estimation by von Frey filaments in the lower abdomen were performed at day 0 and day 10. At day 11, blood and urine were collected to analyze NGF levels by ELISA (RayBio Human beta-NGF Kit). After, rats were urethane anaesthetized and bladder reflex activity was determined by cystometry (saline infusion at 6 ml/h).

Two visceral pain test were used. Test A included animal breathing rate, eyes aperture, and body posture were scored on a 0–10 scale for each parameter. Visceral pain test B scored normal 0, piloerection 1, strong piloerection 2, labored breathing 3, licking the abdomen 4, and stretching and contractions of the abdomen 5. Mechanical hyperalgesia was evaluated using a Von Frey test in the lower abdominal region.

The bladders of intact rats were collected, and bladder strips were left in a culture medium or in culture medium with 1.25 g/l of phenylephrine. After 24 h, the medium was collected and NGF was measured as indicated above

Statistical analysis was performed using Graph Pad Instat 3.0. When comparing two groups, significance was estimated using T test. When comparing more than two groups, significance was estimated using Kruskal-Wallis followed from Dunn's multiple comparisons test.

RESULTS

NGF concentration in the plasma and urine in the sham group were 32.17 ± 18.32 and 17.17 ± 1.73 pg/ml, respectively. The WAS group had a marked increased both in the plasmatic and the urinary NGF levels 2088.47 ± 1027.16 pg/ml and 50.20 ± 25.37 pg/ml, respectively ($p < 0.001$). NGF in the culture medium of the bladder strips contained the same amount of NGF, whether adrenergic stimulated or not (4.97 ± 1.06 and 4.75 ± 0.94 pg/ml.mg bladder strip, respectively).

In the WAS group, at the beginning of the study, the pain score of test A and test B were 0. Ten days later, an increase in score was shown in both tests. Test A increased to 6 ± 5 and test B to 8 ± 4 ($p < 0.05$ for both tests). Von Frey test performed at day 0 and day 10 in WAS group showed a decrease in mechanical pain threshold from 40 ± 24 g to 6 ± 2 g ($p<0.05$). Cystometry showed an increase in the number of reflex voiding contractions between the sham and the WAS group (0.45 ± 0.05 vs 0.83 ± 0.11; $p<0.001$).

In the WAS + GW441756 group, the pain score of test A and test B were 0. At day 10 no changes in the score was observed compared to basal values. The treatment prevented the decrease in mechanical pain threshold during (day 0: 37 ± 19 g; day 10: 25 ± 18 g; $p=0.38$). TrkA antagonist reduced the number of reflex bladder contractions to 0.6 ± 0.07, $p<0.05$ against WAS group).

INTERPRETATION OF RESULTS

The stress conditions induce a marked increase in the systemic NGF levels, as seen by the massive increase in the plasmatic levels. The levels in the urine were more modest. Although also increased during stress, we favor that such increase reflects the systemic increase rather than the local production. In fact, the bladder strips in culture, NGF release was not enhanced by adrenergic stimulation.

The blockade of TrkA receptors caused a marked improvement in visceral pain behavior and in mechanical pain threshold in the lower abdomen. In addition it normalized bladder function.

Altogether this data suggest that chronic stress induce painful behavior and bladder changes by an NGF dependent sensitization of sensory fibers, by binding TrkA, the high affinity receptor for the neurotrophin.

CONCLUDING MESSAGE

Chronic stress conditions induced a massive production in systemic NGF that may influence the response of somatic and visceral sensory fibers. These findings open the opportunity to use NGF levels in the plasma and the blockade of

TrkA receptors for the diagnosis and treatment of chronic visceral painful conditions, such as BPS/IC, respectively.

Funding PFD Research Foundation and ICA IC/PBS Research Grant **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** ORBEA

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ATROPINE RESISTANCE AND ATP RELEASE IN HUMAN OVERACTIVE BLADDER

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HYPOTHESIS / AIMS OF STUDY

Atropine-resistant, nerve-mediated contractions occur in human detrusor only from bladders with detrusor overactivity (DO) regardless of pathology (idiopathic, neuropathic, obstructive [1]), and also in detrusor of most small animals. Such residual contractions are abolished by pre-treatment with α,β methylene ATP (ABMA) to de-sensitise ionotropic purinergic receptors, so it is presumed that ATP is the neurotransmitter, additional to acetylcholine. However, the mechanism whereby ATP is an additional transmitter in human DO has not been clarified. Furthermore, preliminary data suggest nerve-mediated ATP release is independent of acetylcholine release [2], which implies that therapeutic strategies may be devised to reduce selectively ATP release in overactive bladders. This study aimed to test the hypotheses: i) atropine-resistant contractions result from incomplete ATP breakdown in the nerve-muscle junction; ii) ATP and acetylcholine are preferentially released at different frequencies from motor nerves.

STUDY DESIGN, MATERIALS AND METHODS

Human and guinea-pig detrusor was used. Human biopsies were obtained at open-surgery from patients with idiopathic (n=6; 50±15yr) or neuropathic (n=6; 34±10yr) detrusor overactivity (human DO), or those undergoing cystectomy with no DO symptoms (human stable, n=9; 57±14yr). NDO and IDO data were not significantly different in any variable and were merged. Patient ages of the merged DO and stable groups were not statistically different. Guinea-pig detrusor was obtained immediately after animals were euthanised.

Nerve-mediated contractions. Detrusor strips (<1mm diam, mucosa removed), superfused with Tyrode's solution at 37°C (pH 7.4) were field stimulated with 3-s trains (0.1 ms pulses) between 1 and 32 Hz; contractions were abolished by tetrodotoxin (1 μmol.l-1). Atropine (1 μmol.l-1), ABMA (1 μmol.l-1) or apyrase (10U.ml-1) were added to the superfusate as required.

Measurement of ecto-ATPase activity. Detrusor tissue homogenates (7 mg.ml-1) were added to Ca2+-free Tyrode's with initial [ATP] 0.2, 0.5, 1.0, 2.0 or 5.0 mmol.l-1. Two sets of tubes at each [ATP] were used, with the ecto-ATPase inhibitor ARL-67156 (100 μmol.l-1) added to one set. Aliquots were tested for [ATP] every two minutes with a luciferin-luciferase assay to obtain initial rate of breakdown, and the rate plotted as a function of [ATP]. Maximum ectoATPase activity, VATP,max and the Km value were calculated from a plot of ARL-dependent rate of ATP degradation as a function of initial [ATP].

Gene expression of ecto-ATPases. High-quality total RNA was isolated from detrusor tissue homogenate (RNeasy, Qiagen) and used to generate cDNA using reverse-transcription. cDNA was used as a template for qPCR reactions with selectively-designed primers for ectonucleoside triphosphate diphospho-hydrolase (ENTPD) -1, -2, -3, -5 (TaqMan, Applied Biosystems, UK). Gene expressions levels were normalised to 18S ribosomal RNA as an internal control.

Nerve-mediated ATP release. This was measured using amperometric ATP electrodes placed on the surface of detrusor preparations, with reference to a null electrode (Sarissa, UK).

Data presentation and analysis. All data are mean±SEM (n=number of preparations), all variables were measured at least three times in each preparation. Comparison of data sets used ANOVA with post hoc Bonferroni tests. The null hypothesis was rejected at $p<0.05$(*).

RESULTS

Atropine-resistance (AR) was absent in human stable detrusor, most in guinea-pig and intermediate in human DO. AR contractions were further abolished by ABMA. Reduction of contractions by the non-specific extracellular-acting ATPase apyrase showed the same trend (Table 1). The maximum ARL-67516 dependent ATPase activity (VATP,max) was greatest in human stable detrusor homogenates, least in guinea-pig tissue and intermediate in human OA detrusor (Table 1). The Km of ecto-ATPase activity was similar in all three groups.

For nerve-mediated contractions, the similarity of the AR proportion and that which is reduced by apyrase gives confirmatory evidence that both represent purinergic components of contraction. Figure 1A plots the relationship between maximum ecto-ATPase activity and either the percentage AR or reduction by apyrase; in both cases there was a significant inverse relationship.

ENTPdase-1 expression was significantly less in human OA detrusor compared to that from human stable bladders (Table 1). Expressions of ENTPDase-2, -3 and -5 were much less and no difference between stable and OA human (stable vs OA bladder x10-4/18S: ENTPDase-2; 0.035±0.008 vs 0.029±0.010: ENTPDase-3; 0.090±0.025 vs 0.047±0.018: ENTPDase-5, 0.11±0.018 vs 0.14±0.044).

Figure 1B shows ATP-transients associated with nerve-mediated contractions. However, the frequency-dependence of the two phenomena was different – the frequency for

half-maximal response, f1/2, was lower for ATP-transients than for nerve-mediated contractions (figure 1B inset). Also f1/2 values for ATP release and AR contractions (2.5±0.4 vs 3.5±0.6 Hz, respectively) were not significantly different, consistent with AR contractions being due to ATP release.

INTERPRETATION OF RESULTS

The apyrase data provide more direct evidence that atropine-resistant contractions are due to ATP release. The inverse relation between the magnitude of ATP-dependent contractions and ecto-ATPase activity in the three experimental groups implies that atropine-resistance is due to incomplete breakdown of ATP at the nerve-muscle junction in human OA and guinea-pig detrusor, but there is complete breakdown in human detrusor from stable bladders. This was consistent with reduced expression of the main ecto-ATPase subtype (ENTPD-1) in human OA detrusor. Nerve-mediated release of ATP has been measured for the first time in detrusor, and one observation is that ATP is released preferentially at low frequencies and by inference acetylcholine (ACh) at higher frequencies.

CONCLUDING MESSAGE

A molecular explanation for atropine-resistant contractions associated with pathological bladders is provided by reduced expression of the major ecto-ATPase subtype. The different frequency-dependence of ATP and ACh release provides a targeted drug model to modulate the release of a transmitter (ATP) associated with detrusor overactivity in the human bladder.

FIGURE 1

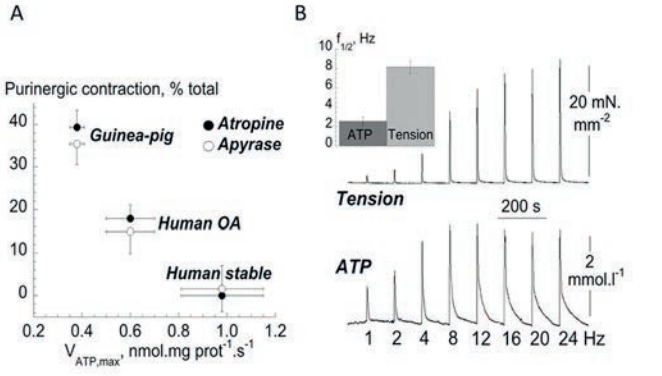

Figure 1. A: The relation between $V_{ATP,max}$ of ectoATPase activity and the purinergic portion of contraction as determined by the action of atropine or apyrase. B: nerve-mediated ATP (lower) and tension (upper) transients. The frequencies, $f_{1/2}$, for half-maximum responses for ATP and tension is in the inset

FIGURE 2

Table 1. ATP-dependent nerve mediated contractions, ARL-dependent ecto-ATPase activity and ENTPDase-1 expression. Number of preparations in parenthesis. Data are mean±SEM, *p<0.05 *vs* human stable; §p<0.05 *vs* human overactive.

	Human stable	Human overactive	Guinea-pig
Nerve-mediated contractions			
Atropine resistance, % total	0.0±0.0 (*6*)	17.9±3.2 (*9*) *	39.3±4.0 (*8*) *§
Apyrase reduction, % control	1.6±5.4 (*6*)	15.0±3.2 (*9*) *	35.4±4.8 (*8*) *§
Ecto-ATPase activity			
$V_{ATP,max}$ ARL-dep, nmol.mg^{-1}.s^{-1}	0.98±0.17 (*8*)	0.60±0.10 (*11*) *	0.38±0.03 (*7*) *§
K_m ARL-dep, mM	1.76±0.41 (*8*)	1.57±0.18 (*11*)	0.97±0.32 (*7*)
ENTDase expression			
ENTPDase-1 x10^{-4}/18S	3.88±0.42 (*9*)	2.61±0.40 (*9*) *	

REFERENCES

1. Bayliss M et al. J Urol 1999; 162: 1833-1839.
2. Pakzad et al. Naunyn Schmiedebergs Arch Pharmacol 2016; 389: 921-929.

Funding NIH:R01 DK098361-01A1. The Braithwaite Foundation **Clinical Trial** No **Subjects** Human **Ethics Committee** University College London Hospitals **Helsinki** Yes **Informed Consent** Yes

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NRF2 PLAYS A CRUCIAL ROLE IN THE PATHOGENESIS OF ISCHEMIA-INDUCED BLADDER OVERACTIVITY

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HYPOTHESIS / AIMS OF STUDY

Pelvic ischemia induces bladder overactivity by stimulating the bladder and its afferent nerves. Nuclear factor erythroid 2-related factor 2 (Nrf2) protects cells from oxidative stress; however, its role in the pathogenesis of ischemic bladder overactivity is unknown. This study examined the relationship between Nrf2 expression and bladder overactivity using a pelvic ischemia mouse model.

STUDY DESIGN, MATERIALS AND METHODS

C57BL/6 mice and Nrf2 knockout (KO) mice were used in this study. Pelvic ischemia was induced by adding L-NG-nitroarginine methyl ester (L-NAME; 0.3 g/L) to their drinking water. On day 7, the blood flow in the capillaries on the bladder surface was measured using a charge-coupled device camera (ref. 1), cystometrography was performed in the awake condition (infusion speed 0.5 mL/h), and the bladder was excised for histological evaluation and to quantify oxidative stress markers.

RESULTS

Immunohistochemical staining of the bladder showed that Nrf2 was mainly expressed in the urothelium and was translocated from the cytoplasm to the nucleus on administration of L-NAME to the C57BL/6 mice. The bladder microcirculation was altered in the ischemia groups in both the C57BL/6 and Nrf2 KO mice (Fig. 1). Oxidative stress markers in the bladder (malondialdehyde and HIF-1α) increased in the pelvic ischemia mice, and this was more apparent in the Nrf2 KO mice. Cystometrography demonstrated that the intercontraction intervals were shorter in the ischemia groups. Nrf2 KO mice micturated more frequently on induction of pelvic ischemia (Fig. 2).

INTERPRETATION OF RESULTS

Activation of the Nrf2 signaling pathway, which leads to the upregulation of antioxidative genes, has been reported to protect neurons against neurodegenerative diseases; to promote myocyte differentiation, muscle contractility, and metabolic properties in a diabetic muscle atrophy model; and to

protect various cells from apoptosis. This study demonstrated that Nrf2 translocated from the cytoplasm to the nucleus in the pelvic ischemia groups. We interpret this as a response to protect organs from ischemic injury. Although bladder blood flow was altered similarly in both the normal and Nrf2 KO mice, ischemic damage and bladder overactivity were more apparent in the Nrf2 KO mice. These results suggest that Nrf2 plays an important role in the development of ischemia-induced bladder overactivity and could be a therapeutic target for overactive bladder associated with pelvic ischemia.

CONCLUDING MESSAGE

Pelvic ischemia caused by administering L-NAME to mice induced detrusor overactivity. The ischemic damage and ischemia-induced bladder overactivity were more severe in Nrf2 KO mice.

FIGURE 1

Fig. 1. Erythrocyte speed on the bladder surface

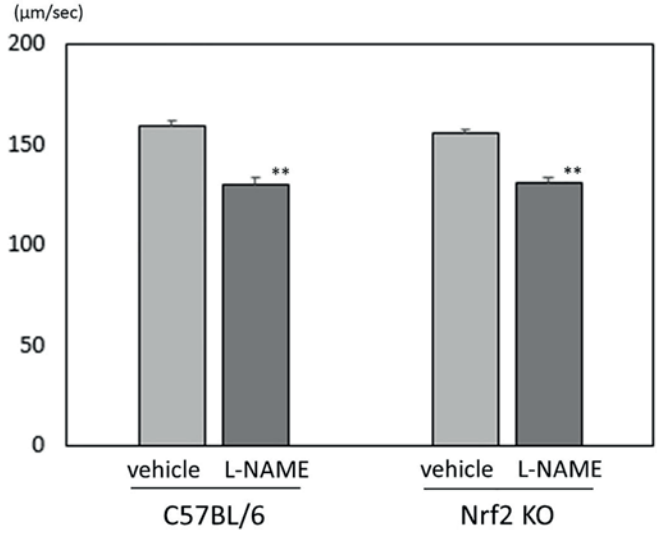
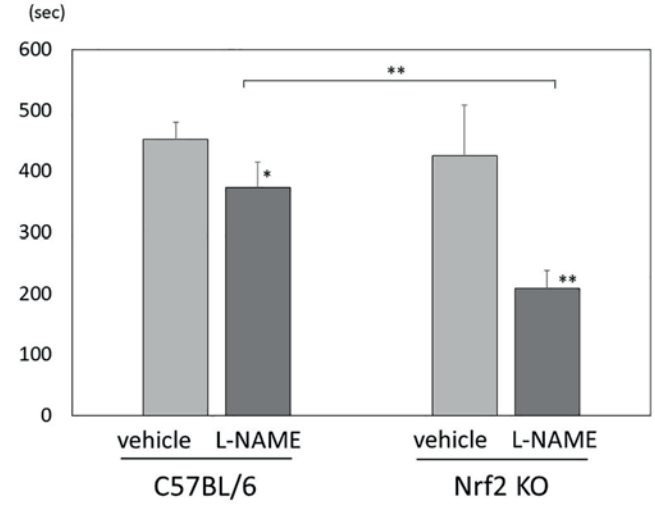


FIGURE 2

Fig. 2. Intercontraction intervals



REFERENCES

1. Mizuno H, Yamamoto T, Okutsu H, Ohtake A, Sasamata M, Matsukawa Y, Funahashi Y, Kato M, Hattori R, Gotoh M. Effect of tamsulosin on bladder microcirculation in a rat ischemia-reperfusion model, evaluated by pencil lens charge-coupled device microscopy system. Urology 2010; 76(5): 1266. e1261-1265.

Funding Japanese Grants-in-Aid for Scientific Research **Clinical Trial** No **Subjects** Animal **Species** Mouse **Ethics Committee** Nagoya University Institutional Animal Care and Use Comittee

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DYSREGULATION OF BETA 3-ADRENERGIC RECEPTOR AND PHOSPHOLAMBAN EXPRESSION IN OUTLET OBSTRUCTION-INDUCED DETRUSOR OVERACTIVITY

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HYPOTHESIS / AIMS OF STUDY

Men with benign prostatic hyperplasia (BPH) and benign prostatic obstruction (BPO) often present with lower urinary tract symptoms (LUTS) including overactive bladder (OAB). OAB is often associated with detrusor overactivity (DO). DO is the urodynamic diagnosis of involuntary spontaneous bladder contractions which can cause the symptoms of OAB. Although the symptomatic diagnosis of OAB does not always correlate with DO, DO is an objective, measureable characteristic of bladder dysfunction. Previously, using next generation sequencing (NGS) we determined mRNA and miRNA expression profiles in biopsies of BPO patients. Here we sought to investigate the specific regulation of beta3-adrenergic receptor and other components of detrusor contractile apparatus, including phospholamban in a larger patients' cohort and in bladder cell-based models.

STUDY DESIGN, MATERIALS AND METHODS

Bladder dome biopsies of controls (n=10) and BPO patients with DO (n=22) were collected and total RNA isolated. Primary smooth muscle (SMC) and urothelial (UE) cells were cultured for several passages. UE cells were differentiated with serum and Ca2+. Regulation of selected genes was studied by qRT-PCR.

RESULTS

Our previous NGS data (n=6 subjects per group) revealed significant up-regulation of phospholamban (PLN), and down-regulation of ADRA2A and ADRB3, encoding alpha 2A and beta 3 adrenoceptors. Here we confirm these findings by RT-qPCR in a larger patients' group. We investigated the expression of ADRB3 mRNA in bladder layers. We reliably detected ADRB3 in patients' biopsies and in differentiated

smooth muscle, but not in urothelium, or cultures of SMC or UE. Importantly, in DO patients SM markers MYH11 and ACTA2 were elevated in line with increased detrusor contractility, indicating that the observed ADRB3 down-regulation was not the result of SM de-differentiation. PLN is targeted my microRNA miR-374a-5p, significantly reduced in DO patients, whereas both ADRA2A and ADRB3 are targeted by the calcium-regulated miR-212-5p, increased in DO.

INTERPRETATION OF RESULTS

Phospholamban (PLN) is an inhibitor of the sarcoplasmic reticulum (SR) calcium-ATPase (SERCA), and its SM-specific upregulation in animal models significantly increases bladder contractility responses to carbachol. Our results indicate that PLN up-regulation and ADRB3 down-regulation in DO smooth muscle might contribute to myogenic overactivity. PLN increase in SM might lead to calcium overload, which induces miR-212-5p and might cause a down-regulation of its target ADRB3, inducing a feed-forward loop which results in bladder overactivity.

CONCLUDING MESSAGE

For the first time we report here a significant down-regulation of beta 3-adrenergic receptor and up-regulation of phospholamban expression in detrusor of BPO patients with DO. These changes might contribute to OAB symptoms in these patients.

Funding The study was funded by the Swiss National Science Foundation (SNF Grant 320030_156161/1) and the Velux Foundation (Grant 895) **Clinical Trial** Yes **Registration Number Clinical Trial**s.GOV **RCT** No **Subjects** Human **Ethics Committee** Permission to conduct this study was obtained from the local **Ethics Committee** Swiss Continal Committee (KEK 146/05 original study, KEK 331/14 follow-up blinded study), **Helsinki** Yes **Informed Consent** Yes

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CIRCADIAN RHYTHM OF BLADDER CLOCK GENES IN LOWER URINARY TRACT DYSFUNCTION OF SPONTANEOUSLY HYPERTENSIVE RATS

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HYPOTHESIS / AIMS OF STUDY

Molecular activity effected by circadian clock genes is responsible for a majority of diurnal variations observed in living organisms. Circadian rhythms are regulated by clock gene products, and in the case of mammals, these clock gene products are present in most cells and organs. The suprachiasmatic nucleus (SCN) of the brain works as a master pacemaker, and is synchronized with a peripheral clock that exists in multiple tissues throughout the whole body, including the lungs, liver, kidneys, bladder, etc. It is reported that transient receptor potential cation channel subfamily V member 4 (TRPV4), vesicular nucleotide transporter (VNUT), and Piezo1 show circadian rhythms in the bladder mucosa and that these circadian rhythms are hindered by clock gene abnormality1). However, the effect of bladder clock genes on bladder dysfunction remains unclear. In this study, we investigate the expression and circadian rhythm of TRPV1, TRPV4, VUNT, Piezo1, and clock genes in the bladders of spontaneously hypertensive rats (SHR).

STUDY DESIGN, MATERIALS AND METHODS

Male Wistar rats (control group) and male SHRs (SHR group) were used in this study. The experimental animals were placed 12 h of alternating light and dark conditions. The light period began at zeitgeber time (ZT) 0 followed by the dark period at ZT 12. Upon completing 18 weeks of age, urination was evaluated using a metabolism gauge (MG). The parameters evaluated included urine volume, urination frequency, and urine volume per void, which defines bladder capacity, for 24 h, during the light and dark periods, and these parameters were compared between the two groups. After collecting MG data, bladders were harvested every 4 h at six time points (ZT 3, 7, 11, 15, 19, and 23) from the control and the SHR group (n = 6 for each time), and the gene expression of Per2, Cry2, Bmal1, Clock, Rev-erbα, TRPV1, TRPV4, VUNT, and Piezo1 was examined using qRT-PCR.

RESULTS

Rat total body and bladder weight were significantly lower in the SHR group than in the control group. The urination frequency for 24 h, both during the light and dark periods, was significantly higher in the SHR group than in the control group. In both the groups, urinary frequency was significantly higher during the dark period than during the light period. Urine volume for 24 h and during the dark period alone was significantly lower in the SHR group than in the control group. In both the groups, urine volume during the dark period was significantly higher than that during the light period. Urine volume per void was significantly lower in the SHR group than the control group during both light and dark periods. In the control group urine volume per void was significantly lower during the dark than during the light period. However, there was no significant difference in urine volume per void between the light and dark periods in the SHR groups. In the SHR bladders, we observed significant increase in the expression of Per2 and Rev-erbα at all time points and increase in Cry2, Bmal1, and Clock expression in some but not all time points compared to the control group. In both the groups, Per2, Bmal1, and Rev-erbα expression had the circadian rhythms with peaks and nadirs, respectively, at ZT 15 and 3 for Per2, 23 and 11 for Bmal1, and 7 and 19 for Rev-erbα. Expression of TRPV1, TRPV4, VUNT, and Piezo1 were significantly higher at point ZT19 in the SHR group than in the control group.

INTERPRETATION OF RESULTS

The mRNA expression of each clock gene in the SHRs was higher than that of the control group. Circadian rhythms were observed in Per2, Bmal1, Rev-erbα, and the variation showed similarities between the control group and the SHR-group. At time point ZT19, the expression of TRPV1, TRPV4, VUNT, and Piezo1 in Wistar rats decreased; however, the expression of these genes in SHRs remained consistent or mildly decreased. These results may correlate with the decreasing urine volume per void and increasing urination frequency during the dark period in SHR.

CONCLUDING MESSAGE

Our results suggest that TRPV1, TRPV4, VNUT, and Piezo1 may be involved in the decrease of bladder capacity during the dark period in SHR.

FIGURE 1

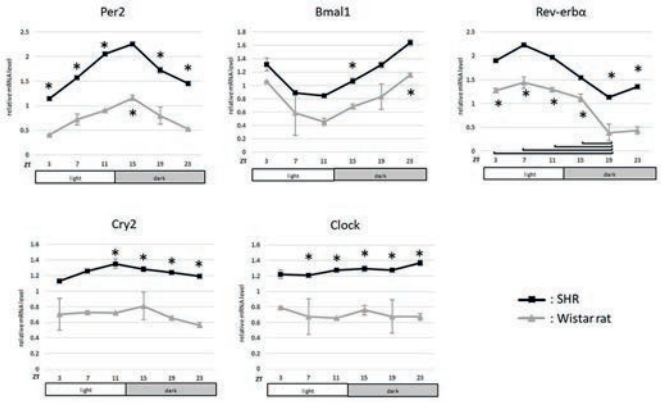

Figure1: Changes in clock gene mRNA expression
Clock gene mRNA expression in the rat bladder in Wistar rats and spontaneously hypertensive rats.
*, significantly different, p<0.05.

FIGURE 2

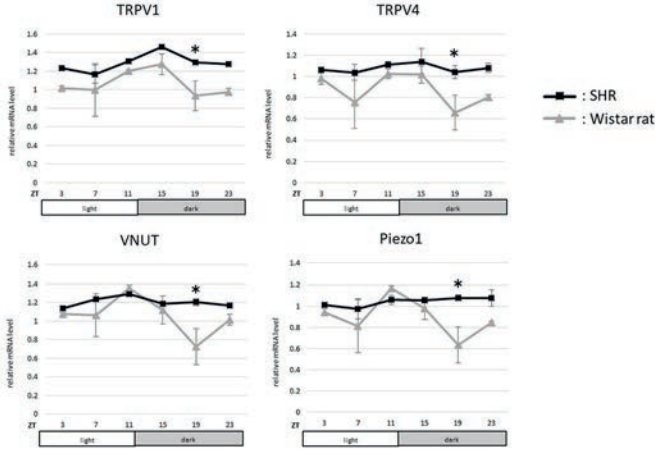

Figure2: Changes in TRPV1, TRPV4, VNUT and Piezo1 mRNA expression
TRPV1, TRPV4, VNUT and Piezo1 mRNA expression in the rat bladder in Wistar rats and spontaneously hypertensive rats. *, significantly different, p<0.05.

REFERENCES

1. PLoS One. 2017 Jan 6;12(1):e0168234

Funding No funding or grant **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** The Committee of the Institute for Animal Experimentation of Tottori University, Yonago, Japan

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SUPERIOR GLUTEAL VEIN SYNDROME: AN INTRAPELVIC CAUSE OF SCIATICA

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HYPOTHESIS / AIMS OF STUDY

While pelvic congestion syndrome is a well-established cause of pelvic pain, the role of malformed or dilated branches of iliac vessels in causing pelvic pain is not well understood. Such vessels may entrap nerves of the lumbosacral (LS) plexus against the pelvic sidewalls, producing symptoms not typically encountered in gynecological practice, including sciatica and refractory urinary and/or anorectal dysfunction. The objective of this study is to describe the intrapelvic compression of LS nerve roots by variant superior gluteal veins (SGVs) and to analyze the outcomes of the laparoscopic treatment of this condition.

STUDY DESIGN, MATERIALS AND METHODS

Retrospective case series of thirteen female patients undergoing laparoscopy for sciatica with no clear spinal or musculoskeletal causes. Patients were selected for laparoscopic intervention based on clinical neuropelveological and urodynamic assessment, which mapped the topography of the nerve entrapment at an intrapelvic level. All patients had previously failed conservative management including pharmacotherapy and physiotherapy. Underlying spinal or musculoskeletal lesions were ruled out by orthopedic, neurosurgical and radiological evaluation.

All surgeries were performed by the same surgeon. Variant SGV branches were defined as those superior to and therefore compressing LS nerve roots against the piriformis muscle and/or the pelvic brim. These variant veins were sealed using bipolar energy and transected, thus detrapping the underlying nerves (Figure 3).

The primary outcome measure was improvement in symptoms after detrapment, determined by comparison of pre- and serial post-operative visual analogue scale (VAS) scores. Success after surgery was defined as a 50% or more improvement in VAS scores. Any new motor deficits and adverse symptoms after surgery were assessed qualitatively. The duration of postoperative neuropathic pain was calculated based on changes in reported symptoms and comparison of serial VAS scores.

RESULTS

Among our thirteen cases, the average age was 35.9 ± 7.36 years. The average time from onset of symptoms to diagnosis was 3.88 ± 3.09 years, and most patients had at least one previous surgery. All cases had a variant SGV that was ligated intraoperatively. One patient also had a variant superior gluteal artery that was also ligated.

The average preoperative VAS score was 9.62 ± 0.77, which decreased significantly to 2.54 ± 2.88 postoperatively (p=0.000001). The success rate was 92.3%, over a follow-up of 13.2 ± 10.6 months (Table 1). No patients had any persistent motor deficits or new symptoms at their last follow-up visit.

INTERPRETATION OF RESULTS

Vascular entrapment is a recognized precipitant of chronic pain syndromes involving the abdomen, pelvis, and lower limbs – such as Nutcracker, pelvic congestion, and May-Thurner syndromes [1]. Neurovascular conflict has also been identified as an underlying cause of pain syndromes in the head & neck and upper limbs. While neurovascular compression is well described in the pathogenesis of trigeminal neuralgia and thoracic outlet syndrome, varicosities and other vascular formations may also confine nerves of the pelvis [2]. Dilations of branches of the iliac vessels that overly the sacral plexus can entrap the sacral plexus against the structures forming the pelvic sidewalls and floor – such as the piriformis muscle, the pelvic brim, and within the pudendal (Alcock's) canal [3].

However, the clinical significance of these intrapelvic nerve entrapments is far less understood, and therefore intrapelvic neurovascular compression in symptomatic patients is likely underdiagnosed. Due to the motor & sensory distribution of the LS plexus, sciatica is not the only symptom observed in our patients. The symptoms suggestive of the SGV syndrome can include: perineal or gluteal pain, anorectal dysfunction, rectal pain, and/or lower urinary tract symptoms in the absence of pelvic organ prolapse or other identifiable causes. We identified entrapment of the LS plexus by a variant SGV in thirteen cases of sciatica with no identifiable musculoskeletal or spinal cause. To our knowledge, this is the first report of this anatomical variant in symptomatic patients in the literature.

Alleviation of symptoms after laparoscopic decompression, with a statistically significant change in VAS pain scores and 92.3% success rate, strongly supports our hypothesis that variations in the SGV may entrap the LS plexus, thereby resulting in the clinical presentation of atypical sciatica. In symptomatic patients with no clear spinal or musculoskeletal lesions, this previously unrecognized neurovascular conflict – SGV syndrome – should be considered as a potential intrapelvic cause of their sciatica.

CONCLUDING MESSAGE

Our cases series demonstrates a correlation between variant SGVs and sciatica with no musculoskeletal or spinal etiology. While MRI has been useful for surgical planning, its diagnostic accuracy in identifying this variant is still to be determined. Radiological markers for this neurovascular conflict must be further developed and validated to assist in understanding the prevalence of intrapelvic neurovascular conflict as a cause of sciatica and pudendal pain and provide an objective tool for selecting surgical candidates who would benefit from laparoscopic nerve decompression.

FIGURE 1

Table 1. Postoperative results after laparoscopic decompression

Postoperative results	Mean	Median	SD	*p* value
Operative time (minutes)	144.54	124.00	±55.10	
Preoperative VAS score	9.62	10.00	±0.77	*
Postoperative VAS score	2.54	2.00	±2.88	<0.0001
Post-decompression pain duration (months)	5.67	6.00	±3.51	
Post-decompression motoric deficit duration (months)	2.67	3.00	±0.58	
Post-decompression motor deficit rate	30.8%			
Post-decompression pain rate	84.6%			
Success rate	92.3%			

FIGURE 2

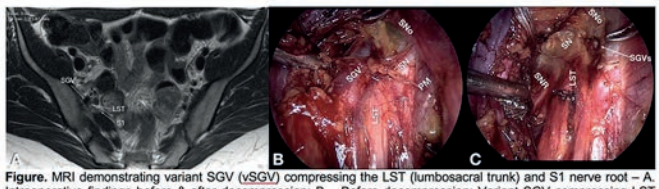

Figure. MRI demonstrating variant SGV (vSGV) compressing the LST (lumbosacral trunk) and S1 nerve root – A. Intraoperative findings before & after decompression: B – Before decompression: Variant SGV compressing LST (lumbosacral trunk) & SN (sciatic nerve); C – After decompression LST, SN and SNR (sciatic nerve roots) visible after vSGV ligation; SNo (sciatic notch); PM (psoas muscle)

REFERENCES

1. Nasser F, Cavalcante R, Affonso B, et al. Safety, efficacy, and prognostic factors in endovascular treatment of pelvic congestion syndrome. Int J Gynecol Obstet. 2014; 125: 65-68.
2. Ferrante M, Ferrante N. The thoracic outlet syndromes: Part 1. Overview of the thoracic outlet syndromes and review of true neurogenic thoracic outlet syndrome. Muscle Nerve. 2017; 55: 782-93.
3. Possover M, Schneider T, Henle KP. Laparoscopic therapy for endometriosis and vascular entrapment of sacral plexus. Fertil Steril. 2011; 95(2): 756-8.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** It is a retrospective observational study and all subjects signed a written informed consent for the proposed procedure and authorization of case data and images for research and educational purposes. **Helsinki** Yes **Informed Consent** Yes

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A RANDOMISED CONTROL TRIAL OF CONTINUOUS LOW-DOSE ANTIBIOTIC PROPHYLAXIS TO PREVENT URINARY TRACT INFECTION IN ADULTS PERFORMING CLEAN INTERMITTENT SELF-CATHETERISATION

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HYPOTHESIS / AIMS OF STUDY

People performing clean intermittent self-catheterisation (CISC) often suffer from repeated urinary tract infections (UTI) s. Previous studies have shown that continuous once-daily, low dose antibiotic prophylaxis is effective in women with normal functioning bladders who suffer from repeated UTI. However, evidence regarding the effectiveness of this strategy is in CISC users is lacking. The aim of this randomised control trial was to assess the benefit and harms of antibiotic prophylaxis to prevent UTI among people performing CISC.

STUDY DESIGN, MATERIALS AND METHODS

This parallel-group, open-label, superiority, patient-randomised trial recruited from the UK National Health Service organisations between 26/11/2013 and 31/01/2016. Adult CISC users were eligible to take part if they were predicted to continue using CISC for the next 12 months and had a history of repeated UTI.

Participants were allocated 1:1 to either once-daily oral antibiotic prophylaxis (nitrofurantoin, trimethoprim or cefalexin) or no prophylaxis, for 12 months. Randomisation was performed centrally using an internet-based system with permuted blocks of variable length. Trial and laboratory staff assessing outcomes were masked to allocation.

The primary clinical outcome was frequency of symptomatic, antibiotic-treated UTI over 12 months. The primary modified intention to treat analysis included all participants who had completed at least 6 months follow up. Secondary outcome measures included frequency of microbiologically confirmed UTI, antimicrobial resistance, health status and participants' attitudes to antibiotic use.

RESULTS

A total of 404 participants were randomised out of 1743 patients screened for eligibility. We included 361/404 (89%) participants in the primary modified intention to treat analysis: 181/203 (89%) in the prophylaxis group and 180/201 (90%) in the no prophylaxis group.

The incidence rate (95% confidence interval) of symptomatic antibiotic-treated UTI over 12 months was 1.3 (1.1 – 1.6) in the prophylaxis group and 2.6 (2.3 – 2.9) in the no-prophylaxis group. This equates to an incidence rate ratio (IRR) of 0.52 (0.44 – 0.61); a 48% reduction in UTI frequency in the prophylaxis group. Use of prophylaxis was well-tolerated, with 19 participants in the prophylaxis group suffering adverse events relating to the use of prophylactic antibiotics predominantly gastro-intestinal disturbance, candida infection and skin rash. Development of antimicrobial resistance was seen more frequently in pathogens and commensals isolated from urine and Escherichia coli from perianal swabs in the prophylaxis group.

INTERPRETATION OF RESULTS

This randomised controlled trial used a pragmatic design within standard health-care settings to provide robust evidence of a substantial reduction in frequency of antibiotic treated symptomatic UTI for CISC users by taking a once-daily, low dose of one of the licensed agents (nitrofurantoin, trimethoprim or cefalexin) over a 12 month period. Prophylaxis was well-tolerated, with few participants suffering overt harm and the majority of users expressing a preference to continue with prophylaxis after the trial had ended. The increase in antimicrobial resistance of pathogens causing UTI to commonly used antibiotics may reduce the long-term efficacy of UTI treatment in individuals continuing to perform CISC and is also a major public health concern.

CONCLUDING MESSAGE

This large randomised trial demonstrates a clear benefit for antibiotic prophylaxis in terms of reducing frequency of UTI for people performing CISC. Antibiotic prophylaxis use appears tolerable for individuals over 12 months. The emergence of resistant urinary pathogens is a major public health concern and may prejudice management of recurrent UTI in the longer term.

FIGURE 1

	Prophylaxis (n = 203) (eligible n = 181)	No prophylaxis (n = 201) (eligible n = 180)		
	Incidence rate (95% CI)	Incidence rate (95% CI)	Incidence rate ratio (95% CI)	p-value
Symptomatic, antibiotic treated UTI (primary outcome)				
All eligible	1.3 (1.1, 1.6)	2.6 (2.3, 2.9)	0.52 (0.44, 0.61)	<0.0001
Subgroup: baseline episodes of UTI < 4	0.8 (0.6, 1.1)	1.7 (1.4, 2.2)	0.46 (0.34, 0.64)	0.45 (for interaction term)
Subgroup: baseline episodes of UTI ≥ 4	1.7 (1.3, 2.2)	3.1 (2.7, 3.6)	0.54 (0.45, 0.64)	
Microbiologically confirmed UTI (secondary outcome)				
All eligible	0.74 (0.58, 0.94)	1.5 (1.3, 1.8)	0.49 (0.39, 0.60)	<0.0001
Subgroup: baseline episodes of UTI < 4	0.32 (0.18, 0.57)	1.2 (0.87, 1.5)	0.28 (0.18,0.48)	0.01 (for interaction term)
Subgroup: baseline episodes of UTI ≥ 4	0.99 (0.77, 1.3)	1.7 (1.4, 2.1)	0.57 (0.45, 0.72)	
Febrile UTI (secondary outcome)				
All eligible	0.13 (0.06, 0.23)	0.26 (0.16, 0.39)	0.71 (0.40, 1.26)	0.24
Subgroup: baseline episodes of UTI < 4	0.07 (0.06, 0.17)	0.12 (0.06, 0.28)	0.62 (0.20, 1.90)	0.24 (for interaction term)
Subgroup: baseline episodes of UTI ≥ 4	0.14 (0.06, 0.30)	0.19 (0.11, 0.33)	0.74 (0.38, 1.48)	
Asymptomatic bacteriuria (secondary outcome)				
All eligible	1.4 (1.2, 1.6)	1.6 (1.4, 1.9)	0.88 (0.74, 1.04)	0.14
Subgroup: baseline episodes of UTI < 4	1.5 (1.2, 2.0)	2.0 (1.6, 2.5)	0.77 (0.60, 1.00)	0.18 (for interaction term)
Subgroup: baseline episodes of UTI ≥ 4	1.3 (1.1, 1.6)	1.4 (1.1, 1.6)	0.98 (0.77, 1.23)	

Results of performing Poisson regression (incidence rate ratio approach) for primary outcome: number of symptomatic antibiotic-treated UTI, and secondary outcomes: microbiologically confirmed UTI, febrile UTI and asymptomatic bacteriuria. CI = confidence interval

Funding UK National Institute for Health Research **Clinical Trial** Yes **Registration Number** ISRCTN: 67145101 **RCT** Yes **Subjects** Human **Ethics Committee** NHS Research Ethics Service Committee North East – Sunderland [Research **Ethics Committee** (REC) reference 13/NE/0196] **Helsinki** Yes **Informed Consent** Yes

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CONSERVATIVE MANAGEMENT AWARD (JOINT)

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COMBINED BEHAVIORAL AND DRUG TREATMENT OF LOWER URINARY TRACT SYMPTOMS IN MEN: THE COBALT RANDOMIZED CONTROLLED TRIAL

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HYPOTHESIS / AIMS OF STUDY

First-line behavioral and drug therapies for lower urinary tract symptoms (LUTS) are effective but not usually curative. The primary aim of this study was to determine whether combining behavioral and drug therapy improves outcomes compared to each treatment alone for LUTS in men. The second aim was to compare 3 models for implementing combined therapy: 1) stepped therapy with behavioral therapy started first, 2) stepped therapy with two-drug therapy started first, and 3) initiating both behavioral and drug therapy at the same time.

STUDY DESIGN, MATERIALS AND METHODS

This was a 3-site, 2-stage, 3-arm randomized controlled trial conducted 2009-2015. Participants were community-dwelling men, 40 years of age or older, with urgency and 9 or more voids per 24-hours on 7-day bladder diary. They were stratified on voiding frequency and presence/absence of incontinence and randomized to 6 weeks of behavioral treatment alone, two-drug therapy alone, or combined behavioral + drug therapy (stage 1), followed by step-up to combined therapy for an additional 6 weeks for participants who first received monotherapy (stage 2). Behavioral treatment consisted of pelvic floor muscle training with urge suppression strategies and delayed voiding. Two-drug therapy consisted of an anti-muscarinic (sustained-release tolterodine 4mg) + an alpha blocker (tamsulosin 0.4mg).

Seven-day bladder diaries completed before and after each 6-week treatment stage were used to calculate reduction in 24-hour voiding frequency (primary outcome) and other LUTS (urgency, urgency incontinence, and nocturia). Other secondary outcome measures included validated patient global ratings of improvement and satisfaction, the Overactive Bladder Questionnaire (OAB-q) and the International Prostate Symptom Score questionnaire (IPSS).

Based upon the results of an earlier trial, and assuming normally distributed outcomes and a standard deviation of 2.5 for mean number of voids per day, sample sizes of 60 per group would provide 90% power to detect a difference of 1.5 voids with a significance level (alpha) of 0.025 using a one-sided two-sample t-test. The overall sample size was increased to 204 (68 per group) in anticipation of 10% loss to follow-up.

RESULTS

Two hundred four men were randomized, 71 to behavioral treatment alone, 68 to drug alone, and 65 to combined therapy. They ranged in age from 40-92 (mean=64.1) years; 65.2% were white, 26.5% African American, 8.3 other races; and 14.7% were Hispanic. Twenty-one men discontinued and 183 completed treatment.

At 6 weeks (stage 1), mean voids per 24-hour day decreased significantly in all three groups: 24.7% in behavioral alone, 12.7% with drug alone and 30.5% with combined treatment (all $p< 0.0001$). Intent to treat analyses after multiple imputation indicated that post-treatment mean voiding frequencies were significantly lower in the combined therapy group compared to drug alone ($p<0.0001$), but not significantly lower than the behavioral alone group ($p=0.19$) after adjustment for baseline voiding frequency and age. Further, mean voiding frequencies were lower for behavioral alone compared to drug alone ($p=0.0005$). Similar results were obtained from the complete cases analyses. Significant group differences were also found in favor of combined therapy on the secondary outcomes. Post-treatment, more participants in combined therapy rated themselves as "better" or "much better" (81.2% behavioral; 64.7% drug; 90.1% combined; $p=0.0001$) and more were completely satisfied (28.1% behavioral; 20.0% drug; 49.2% combined; $p=0.0001$). Side-effects were lowest in the behavioral group; 51.6% in the behavioral alone group reported no side effects compared to 18.0% in drug alone and 13.1% in combined therapy ($p<0.0001$).

At 12 weeks (stage 2), after all groups had received combined therapy (either initially or stepped), overall change in voiding frequency was 31.6% in the group that started with behavioral alone, 27.1% in the group that had started with drug alone, and 32.2% in the group that had been treated with combined therapy from the beginning. There were no longer differences between the groups on the primary outcome ($p=0.33$). Following a similar pattern, at 12 weeks, improvements were greatest in the combined therapy group, but without between group differences on the other bladder diary and questionnaire measures: nocturia, mean urgency, maximum urgency, OAB-q, IPSS. Patient perception of improvement as "better" or "much better" was similar across groups (87.8% behavioral; 85.2% drug; 95.1% combined; $p=0.32$). Percent of patients completely satisfied had increased in the originally single therapy groups and were more similar to the combined therapy group (51.6% with behavioral first; 52.5% with drug first; 47.5% with combined throughout; $p=0.82$). Side-effects no longer differed by group (21.0% in the behavioral first group reported no side effects compared to 14.8% in drug therapy first and 20.3% in the combined therapy throughout group; $p=0.55$).

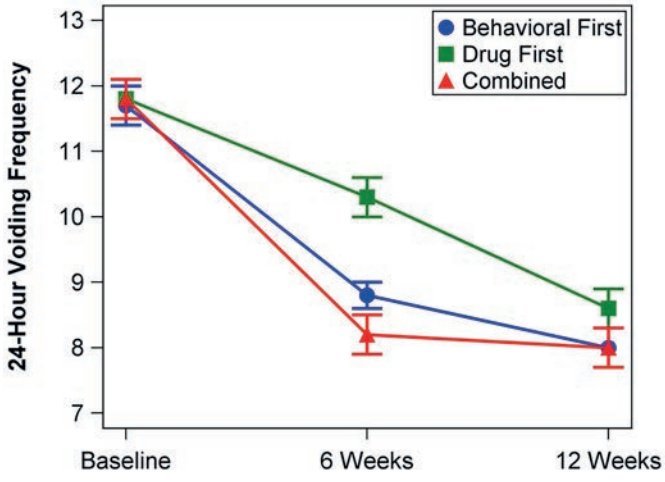
INTERPRETATION OF RESULTS

In men with LUTS, combining behavioral and drug therapy yields significantly greater short-term reductions in voiding frequency compared to drug therapy alone, but not compared to behavioral treatment alone. Combined therapy also yields the best outcomes on patient-perceived improvement and satisfaction, but with more side-effects than behavioral alone. Overall, the 12-week outcomes of the 3 models for implementing combined therapy were not significantly different.

CONCLUDING MESSAGE

While the 3 models of combined therapy were similarly effective, when using a stepped approach, it is reasonable to begin with behavioral therapy alone, because it yielded fewer side effects and better outcomes at 6 weeks. Thus, results were achieved more quickly when starting with behavioral therapy alone than when starting with drug therapy alone.

FIGURE 1



Funding National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health (R01DK082548) **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov: NCT01187498 **RCT** Yes **Subjects** Human **Ethics Committee** University of Alabama at Birmingham Institutional Review Board for Human Use **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "PREVENTION AND PUBLIC HEALTH"

MIND OVER MATTER; HEALTHY BOWELS, HEALTHY BLADDER: AN INDIVIDUALLY RANDOMIZED GROUP TREATMENT TRIAL

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HYPOTHESIS / AIMS OF STUDY

Mind Over Matter; Healthy Bowels, Healthy Bladder (MOM) is a four-week, community-based, small-group behaviour intervention led by a trained facilitator. MOM builds skills and self-efficacy to change behaviours to promote continence, and improved both urinary (UI) and faecal incontinence (FI) in pilot-testing. We sought to determine the impact of MOM on UI, FI, and care-seeking for incontinence among older women using a randomized, waitlist control trial.

STUDY DESIGN, MATERIALS AND METHODS

In this individually randomized group treatment trial, 16-30 women with UI and/or FI were recruited from each of 6 communities (target sample size 110). Women allocated to the treatment arm completed MOM in their community immediately after baseline assessment, and trained fidelity observers attended intervention sessions to monitor adherence of intervention protocol. The primary outcome was UI symptom improvement as measured by the Patient Global Impression of Improvement (PGI-I) at four months. Secondary outcomes assessed via validated measures were UI and FI symptoms, self-efficacy, and depression. Participants were also asked about behaviour changes and care-seeking for UI and FI. Using intent-to-treat analyses, McNemar's Chi-square test compared categorical outcomes and t-test compared differences in means for continuous variables between treatment and control groups.

RESULTS

Of 166 women screened, 122 were consented and 121 randomized (62 treatment; 59 control); 116 (95%) completed the 4-month assessment. Trained observers confirmed no major lapses to intervention delivery with fidelity in the treatment groups. There were no significant between-group differences at baseline (Table 1). At 4 months 71% of treated women, vs. 23% of controls, reported improved UI on PGI-I ($p<.01$); 39% vs. 5% were much or very much improved ($p<.01$). Regarding FI, 55% of treated women, versus 27% of controls, improved on PGI-I ($p<.05$), with 35% vs. 10% reporting significant improvement ($p<.05$). Odds ratios did not change significantly when controlling for community (Table 2). Treated women improved more than controls on all validated instruments of UI and FI severity, quality of life, and self-efficacy (Table 3). In the treatment group, the proportion performing Kegels often or always was 16% at baseline, 93% at 1 month, and 62% at 4 months, while the control group remained steady

at 9%, 8%, and 9%, respectively (p<.001). Care-seeking rates were similar between groups at 4 month assessment, with 46% of treated women and 45% of controls planning to talk with a healthcare provider about UI (p=.94) and 28% versus 37% planning to talk with a provider about FI (p=.34).

INTERPRETATION OF RESULTS

Participation in MOM improved both UI and FI and resulted in sustained behaviour change four months after initiating the intervention, and did not impact rates of care-seeking for UI or FI.

CONCLUDING MESSAGE

Given these promising effectiveness data, MOM should be disseminated more broadly. Subsequent research should evaluate long-term impact on symptoms as well as effectiveness in other populations.

FIGURE 1

Table 1 – Sample Description

Characteristic	Treatment (N=62)	Control (N=59)	p-value
Age in years - mean (SD)	74.5 (8.1)	74.9 (10.4)	.84
BMI in kg/m2 - mean (SD)	29.0 (7.0)	30.1 (7.4)	.24
Hispanic/Latina Ethnicity – n (%)	0(0)	1(2)	.47
Race – White – n (%) Native American /Alaska Native	61(98) 1(2)	56(97) 2(3)	.61
Works full- or part-time – n (%) Retired Volunteer only	8 (13) 49 (79) 5 (8)	12 (21) 42 (72) 4 (7)	.52
Insurance: Medicare only – n (%) Medicaid +/- Medicare Private / employer only	50 (82) 5 (8) 6 (10)	44 (75) 5 (9) 10 (17)	.51
Has diabetes mellitus – n (%)	10(16)	12(20)	.55
Excellent / very good health – n (%)	34 (55)	27 (46)	.32

Table 2 – Patient Global Impression of Improvement for Urinary and Faecal Incontinence

	OR (95% CI)	p-value	AOR (95% CI)*	p-value
Any improvement – UI	8.4 (3.6, 19.3)	<.001	9.1 (3.7, 22.3)	<.001
Much improved – UI	11.5 (3.2, 41.2)	<.001	12.1 (3.3, 44.7)	<.001
Any improvement – FI	3.3 (1.5, 7.1)	.003	3.7 (1.6, 8.7)	.003
Much improved – FI	4.4 (1.6, 12.0)	.004	5.3 (1.8, 15.7)	.003

*Controlling for community

FIGURE 2

Table 3 – Validated instrument scores in treatment versus control groups – mean (SD)

	Treatment Group			Control Group			
Measure	Baseline	4 month	Delta	Baseline	4 month	Delta	p-value
PFDI-20	95 (46)	71 (44)	-23 (38)	100 (49)	91 (46)	-9 (31)	.031*
ICIQ-UI	9.7 (5.0)	7.7 (4.5)	-2.1 (3.1)	8.6 (3.7)	9.0 (3.7)	0.3 (2.7)	<.0001
SMIS	6.7 (4.7)	5.1 (3.7)	-1.7 (3.7)	7.1 (4.6)	7.2 (4.5)	-.3 (4.0)	.049
GSE-UI	60 (28)	71 (62)	11 (22)	56 (27)	58 (51)	2 (16)	.015
PHQ-9	3.5 (4.0)	3.8 (4.3)	0.3 (2.3)	4.5 (4.9)	4.4 (4.6)	0 (3.2)	.57

Abbreviation key:
BMI – body mass index; FI – faecal incontinence; ICIQ-UI – International Consultation for Incontinence Questionnaire – Urinary incontinence; SMIS – St. Marks Incontinence Scale; GSE-UI – Geriatric Self-Efficacy for Urinary Incontinence; PFDI – Pelvic Floor Distress Inventory; PHQ – Physical Health Questionnaire; SD - standard deviation

Funding 1) NIH K12DK100022; 2) Wisconsin Partnership Program New Investigator Program Award **Clinical Trial** Yes **Registration Number** www.clinicaltrials.gov; NCT02671747 **RCT** Yes **Subjects** Human **Ethics Committee** Minimal Risk Health Sciences Institutional Review Board at UW-Madison School of Medicine and Public Health **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "QUALITY OF LIFE / PATIENT AND CAREGIVER EXPERIENCES"

HOW DOES URINARY INCONTINENCE INFLUENCE CARE DEPENDENCE AND CAREGIVING AMONG OLDER WOMEN IN THE COMMUNITY? RESULTS FROM A NATIONAL SAMPLE

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HYPOTHESIS / AIMS OF STUDY

Urinary Incontinence (UI) can affect women's ability to carry out activities of daily living as well as provide care to others. However, little is known about clinical and demographic factors that predispose older women with UI to becoming functionally dependent and how UI affects their ability to serve as caregivers. We aimed to describe the prevalence of care-dependence and caregiving among older community-dwelling women with UI and assess the strength of relationships between UI and care dependence and caregiving in this population.

STUDY DESIGN, MATERIALS AND METHODS

We conducted a cross-sectional analysis of data from the National Social Life, Health, and Aging Project, a multiethnic, national sample of community-dwelling adults in the United States aged 57 to 83 years at baseline. Urinary incontinence, care dependence, and caregiving were assessed by questionnaire among female participants in 2010-2011. Participants were asked about difficulty controlling their bladder in the past 12 months, including "leaking small amounts of urine, leaking when you cough or sneeze, or not being able to make it to the bathroom on time". Care dependence was assessed by asking women if they had difficulty carrying out each of 7 activities of daily living (ADLs) and 7 instrumental activities of daily living (IADLs); those reporting difficulty were asked whether they received assistance from another person for ADLs or IADLs. Caregiving was assessed by asking women if they were currently assisting an adult who needed help because of age or disability. Multivariable logistic regression models evaluated associations between UI and care dependence and caregiving behaviors. Among women with UI, additional models assessed risk factors for care dependence. Models were tested both unadjusted and adjusted for age, race/ethnicity, marital status, education level, and overall self-reported health. Among caregivers, additional multivariate models examined differences in self-reported health by UI status.

RESULTS

Of the 1703 women (mean age 71 years), 27% reported UI at least a few times a week (severe UI), 13% a few times a month (moderate UI), and 59% a few times a year or less (minimal or no UI). The proportion of women receiving care for ADLs and IADLs increased with frequency of UI symptoms (Fig-

ure 1). Compared to women with minimal or no UI, women with moderate-severe UI were more likely to have difficulty with at least one ADL (AOR=2.6, 95%CI 1.9-3.4) or IADL (AOR=1.7, 95%CI 1.3- 2.3) and receive care for at least one ADL (AOR=2.4, 95%CI 1.6-3.6) or IADL (AOR=1.9, 95%CI 1.4-2.6). Compared to 46% of women with minimal or no UI, 60% of those with moderate-severe UI reported an unmet need for assistance, defined as having difficulty with but not receiving care for one or more ADL/IADLs (p=.0002 in adjusted models). Among women with moderate-severe UI, factors associated with care dependence included more frequent UI, older age, being married, and having fair/poor self-reported health (p <.05 for all). Overall, 14% of women reported serving as caregivers for others. 15% of women with moderate-severe UI and 13% of women with minimal or no UI identified as caregivers (p=.84). The number of hours per day spent providing care also did not significantly differ by UI status (p=.31) (Figure 2). However, female caregivers with moderate-severe UI reported lower average health scores than those with minimal or no UI, based on a 5-level self-report measure of overall health (p=.0004).

INTERPRETATION OF RESULTS

Older women with UI are more likely to be functionally dependent and have an unmet need for care than those without UI, even after adjusting for other clinical and demographic factors. At least one in ten older U.S. women with UI serves as a caregiver, despite having worse overall health than female caregivers without UI.

CONCLUDING MESSAGE

Findings support the need for more systematic assessment of the care needs of older women with UI in order to preserve their ability to live independently and provide care for others. Prevention and treatment of UI may not only help to reduce care dependence in older women, but also strengthen the older female caregiver workforce.

FIGURE 1

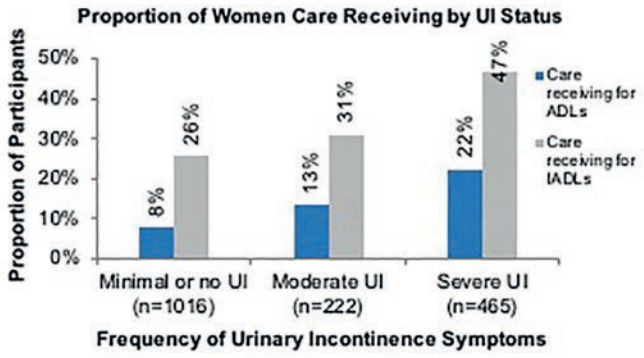
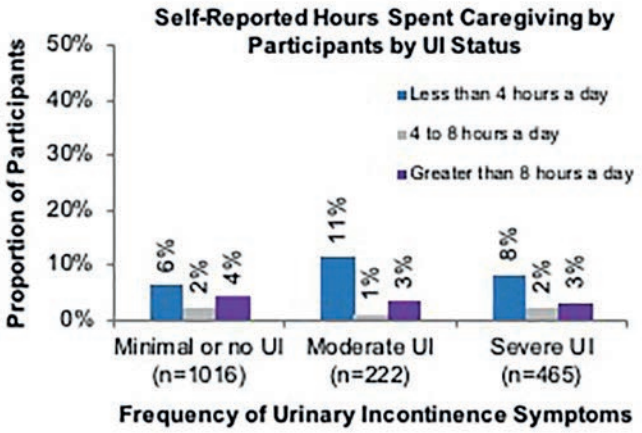


FIGURE 2



Funding NIH/NIA 5RO1AG021487; NIH/NIA 5T35AG026736-13 **Clinical Trial** No **Subjects** Human **Ethics Committee** University of Chicago **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "GERIATRICS / GERONTOLOGY"

IMPACT OF A STRONG DESIRE TO VOID ON GAIT IN CONTINENT AND INCONTINENT COMMUNITY-DWELLING OLDER WOMEN WHO HAVE EXPERIENCED FALL IN THE LAST YEAR

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HYPOTHESIS / AIMS OF STUDY

Falls and urinary incontinence (UI) are both major issues affecting elderly women aged 65 and over. The fall rate in urge and mixed urinary incontinent elderly women is 29% compared to 20% in continent elderly women (1). However, the relation between falls and incontinence is still not well understood. One hypothesis is that a strong desire to void (SDV) could alter gait parameters and therefore increase the risk of falling (2). The primary objective of the study is to investigate the effect of a SDV on gait parameters in urge/mixed incontinent and continent community-dwelling women who are at risk of fall. The secondary objective is to determine the relationship between UI severity and gait parameters in the group of incontinent women.

STUDY DESIGN, MATERIALS AND METHODS

An observational pilot study was undertaken with two groups of healthy community-dwelling women aged 65 and over, who experienced at least one fall in the past year with and without UI. To be included in the urinary incontinent group, a participant had to have moderate to severe urge/

mixed UI as determined by the International Consultation on Incontinence Questionnaire on UI Short Form (ICIQ-UI SF) and >= 3 urine leakages/week in the 7-day bladder diary (with at least one urgency-related leak). To be included in the continent group, participants had to have an ICIQ-UI SF score equal to 0, no urine leakage reported in the past year and none in the 7-day bladder diary. Participants with a body mass index (BMI) >=35 and health conditions likely to influence gait or urinary continence during the study were excluded. After signing a consent form and completing a 24-h pad test, each participant participated in a 3-h gait laboratory assessment. Demographics and the results of a Montreal Cognitive Assessment test (MOCA) were acquired for all participants. History of falls was also recorded. After drinking water until they experienced a SDV as determined by a score of 3 on the Urinary Sensation Scale (USS), participants were asked to walk on a computerized gait analysis mat (GAITRite), on their way to the toilet. After emptying their bladder, i.e. with no desire to void (NDV), they were asked to walk again on the instrumented mat. Spatial and temporal gait parameters and their variability were calculated for the two groups. Descriptive statistics were obtained for demographic, cognitive, UI and gait data. Independent t-test and Chi-square test were used to compare the continent and UI groups for demographic, cognitive and UI outcomes. An analysis of variance (ANOVA) with repeated measures was conducted to explore the differences between the two groups (continent/incontinent) for the two conditions (NDV and SDV). As BMI was significantly different between groups, we included BMI in our ANOVA (BMI<25/>=25). In order to quantify the impact of the desire to void on gait, the Eta square effect size (η2) was also calculated for each of the gait parameters. Finally, for the incontinent group, the correlation between incontinence severity as determined by ICIQ-UI SF and gait parameters for both conditions (NDV and SDV) was computed using Spearman correlation tests.

RESULTS

Thirty-two women participated in the study; 17 continent and 15 urge/mixed urinary incontinent. Demographics, cognitive, number of falls and continence status/severity outcomes for each group are presented in Table 1. BMI, number of falls, ICIQ-UI SF scores, 24-h pad test weight, and number of urine leakages noted in the bladder diary were significantly different between groups favoring the continent group (Table 1). There was a statistically significant main effect between the two conditions with a large effect size for reduced velocity and stride width, and a moderate effect size for increased stance time and reduced stride length when experiencing a SDV (Table 2). However, there was no group effect. Of note, 6/15 (40%) of the incontinent women walked at a speed of under 100 cm/s in both conditions as opposed to only 2/17 (12%) of continent women with NDV and 3/17 (18%) with SDV. Furthermore, the stride length was shorter in women with a BMI >=25 (p=0.04) in both conditions. The BMI had no effect on other gait parameters in any condition. In the incontinent group, we found moderate correlations for the SDV condition with reduced velocity (rs= -0.45, p=0.01) and reduced stride length (rs= -0.49, p<0.01) related to more severe incontinence. In the NDV condition, reduced velocity (rs=-0.43, p=0.01), reduced stride length (rs= -0.49, p<0.01) and increased stance time variability (rs= 0.49, p<0.01) were moderately correlated with more severe incontinence.

INTERPRETATION OF RESULTS

Gait parameters were influenced by SDV, regardless of the group. The reduced velocity observed when experiencing a SDV was due to a shorter stride length and increased stance time. We propose that it is easier to hold urine when experiencing SDV by reducing walking velocity and shortening stride width. Although they were no group effect, incontinent women showed a clinically slower walking velocity with NDV than their continent counterparts. When experiencing SDV, they reduced their already slower walking velocity. This is of importance because a walking speed under 100 cm/s is related to a higher risk of falls (3). In the incontinent group, UI severity was correlated with slower gait parameters and an increased gait variability. As increased variability is known to be related to a higher risk of falls, women with severe UI could be at higher risk (3).

CONCLUDING MESSAGE

To our knowledge, this is the first observational study of urinary incontinent and continent community-dwelling women who have experienced falls to report the influence of SDV on gait parameters. The SDV affected the spatiotemporal parameters of gait, regardless of the continence status, which could increase the risk of falls. Finally, in those with more severe incontinence, gait parameters could be related to a higher risk of falls, in both conditions. More studies are needed to confirm these results and to further understand falls in an incontinent population.

FIGURE 1

Table 1: Demographics, cognitive, number of falls and continence status/severity outcomes

	Continent (n=17) Mean (SD)	Incontinent (n=15) Mean (SD)	p
Age (years)[c]	74.6 (4.1)	73.5 (5.9)	0.53
BMI (kg/m²)[c]	24.6 (3.0)	28.3 (4.8)	<0.01[a]
MOCA (/30)[c]	27 (3)	28 (2)	1.00
No. of falls in the last year (%)[b]:			0.03[a]
1	70.6%	33.3%	
2	29.4%	40.0%	
3 and +	0%	26.7%	
ICIQ-UI SF (/21)[b]	0 (0)	12 (3)	<0.01[a]
Pad test 24 h (gr.)[b]	0.6 (0.5)	9.3 (10.8)	0.04[a]
No. of urine leakages/day [b]	0 (0)	1 (2)	<0.01[a]

SD: Standard deviation, a: significant: p<0.05 b: Chi-square test c: t-test

FIGURE 2

Table 2: Gait parameters in both groups with strong desire to void (SDV) and no desire to void (NDV)

	Continent		Incontinent					
	Mean (SD) SDV (n=17)	Mean (SD) NDV (n=16)	Mean (SD) SDV (n=15)	Mean (SD) NDV (n=15)	*F; p value NDV vs SDV*	*Effect size NDV vs SDV (η^2)*	*F; p Value Group continent vs incontinent*	*F; p value BMI ≥25 vs <25*
Velocity (cm/s)	118 (18)	120 (17)	106 (17)	107 (20)	4.06; 0.05	0.13	1.46; 0.24	1.24; 0.28
Stride width (cm)	9.9 (2.5)	10.5 (2.0)	10.8 (2.6)	10.9 (2.5)	5.74; 0.02[a]	0.18	0.04; 0.95	3.40; 0.08
Stride length (cm)	126.3 (12.3)	127.4 (12.9)	114.2 (15.0)	114.5 (16.9)	1.95; 0.17	0.07	1.94; 0.18	4.83; 0.04[a]
Stance time (s)	0.69 (0.10)	0.67 (0.07)	0.69 (0.06)	0.69 (0.06)	3.75; 0.06	0.12	0.09; 0.76	0.00; 0.96

a: significant p<0.05, SD: standard deviation
Effect size were interpreted as follow: $0.06 \leq \eta^2 < 0.13$=moderate, $\eta^2 \geq 0.13$=large

REFERENCES
1. Chiarelli PE, Mackenzie LA, Osmotherly PG. Urinary incontinence is associated with an increase in falls: a systematic review. Aust J Physiother. 2009;55(2):89-95.
2. Booth J, Paul L, Rafferty D, Macinnes C. The relationship between urinary bladder control and gait in women. Neurourol Urodyn. 2013;32(1):43-7.
3. Mortaza N, Abu Osman N, Mehdikhani N. Are spatio-temporal parameters of gait capable of distinguishing a faller from a non-faller elderly? European Journal Physical rehabilitation medecine. 2014;50:677-91.

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AVAILABILITY OF PUBLIC TOILETS IN MAJOR INTERNATIONAL CITIES USING GEOGRAPHIC INFORMATION SYSTEMS

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HYPOTHESIS / AIMS OF STUDY

The aim of the study was to describe and map the availability (number, density, and distribution) of public toilets in major international cities in different countries by city population and area.

STUDY DESIGN, MATERIALS AND METHODS

The study had an observational/descriptive design. Twelve cities in 9 counties that had available data were selected: Minneapolis-St. Paul (MSP), New York City (NYC), and Philadelphia in the United States [US], Greater London including city of London in the United Kingdom [UK], Greater Sydney including city of Sydney [Australia], Paris [France], Berlin [Germany], Brussels, [Belgium], Toronto, [Canada], Osaka, [Japan], and Seoul, [South Korea]. Data of the location and number of public toilets were acquired from Parks and Recreational Departments in the US. Data in other countries were acquired from online open data archives created and managed by national or local governments. Data of a city's area, boundaries, and population were from a national Census survey and/or statistics database.

Public toilets were defined as publicly owned and managed facilities in parklands (i.e., park/recreation areas in US cities and Osaka) or in open spaces (i.e., park/recreation areas + transportation stations, or on street in other cities). As analysis units, "administrative" areas were used for Berlin [the areas were Bezirke/borough or district], Brussels [commune/municipality], London [borough], NYC [borough], Osaka [Ku/ward], Paris [Arrondissements/district], Seoul [Gu/ward], and Toronto [ward]. "Statistical" areas were used for MSP and Philadelphia [Census Tract] and Sydney [Statistical areas–Level 4]. Administrative areas were local entities directly controlled by the municipal government, e.g., city council. Statistical areas were designated by government agencies for statistical/demographic purposes, e.g., Census. Geocoded locations of public toilets in cities were mapped and counted along with the administrative or statistical areas using ESRI's ArcGIS version 10.5.1. Total population and total areas (km2) of cities were calculated by summing the population and area (km2) in individual area units. The mean area was calculated by total area/individual area units. The density of public toilets was calculated by population (number of toilets/100,000 residents) and by total area (km2) of cities. Visual presentation using maps was used to illustrate the distribution of public toilets in each city.

RESULTS

The characteristics of the population, area, and public toilets are presented in Table 1 for cities with public toilets in parklands and in Table 2 for cities with public toilets in open spaces. The population of the cities ranged from medium (<1 million) in MSP to very large (>10 million) in Seoul. The most densely populated city was Paris (21,394 residents per km) followed by Seoul, Osaka, and NYC. Sydney had the lowest population density (407 residents per km2).

The density of public toilets per area (km2) of parklands was highest in Osaka (1.44) followed by NYC (0.79 toilets) (Table 1). MSP had the most toilets in parklands per 100,000 residents (24.10). The density of public toilets per area of open spaces (km2) was highest in Paris (3.47) and Seoul (2.11) and lowest in Berlin, Sydney, and Brussels (Table 2). Sydney had the most toilets in open spaces per 100,000 residents (54.77 toilets) while Brussels and Berlin had the fewest, with <5 toilets per 100,000 residents.

Regarding distribution of toilets, visual examinations using maps showed that public toilets in MSP and Toronto were fairly evenly distributed across parkland areas. Conversely, the distribution of public toilets in open spaces in Brussels was highly concentrated in one area, the region of Brussel [Dutch]/Brexelles [French]. A couple of boroughs in London had no public toilets reported by the local government.

INTERPRETATION OF RESULTS

The availability of public toilets varies among international cities. Considering city population and area, availability is high in Paris, Seoul, MSP, Philadelphia, and Sydney and low in Berlin and Brussels. The density of public toilets in open space areas per km2 seems to be directly related to population density in Paris and Seoul but the opposite is seen in Sydney. Sydney has the lowest population density but the highest toilet density in open spaces per km2. The lower density of public toilets in parklands areas per km2 in MSP and Toronto seems to be associated to the even distribution of toilets across areas. However, MSP has the highest number of parklands toilets per population density while Toronto has the lowest number. Brussels has the fewest toilets per population and their toilets are the least distributed.

Limitations: The data of all public toilets (i.e., those provided/managed by private companies or temporary ones) in cities were not available to collect. No standardized international criteria exist for determining the boundaries or unit areas of a city. The exact location (e.g., street address) of a public toilet vs. its general area was sometimes not provided in the software.

CONCLUDING MESSAGE

Adequate public toilets in park and recreational sties or on routes to destinations may be beneficial to persons with incontinence to achieve being continent while in public. Toilet availability may also assist these persons to be active and engage in physical or social activities [1] in their neighborhoods. A shift towards a community-based healthcare model seems to be effective for community-living people with chronic incontinence [2]. Improvements in the availability of public toilets may mediate the negative feelings such as depression or social isolation often experienced by people with incontinence. Finally, urban planning should introduce health aspects of toilet availability into the designs of cities as part of the responsibilities of cities to improve health and quality of life in their residents.

FIGURE 1

Table 1. Characteristics of Cities with Toilets in Parklands

	MSP (CT=199)	NYC (n=5)	Osaka (n=24)	Philadelphia (CT=384)	Toronto (n=44)
Total population	697,069	8,426,743	2,691,185	1,555,072	2,914,738
Total area (km²)	279.72	779.59	225.21	347.06	637.85
Mean area (km²/n)	1.41	129.93	9.38	0.90	14.50
Mean Population per area	3,503	1,404,457	112,133	4,050	66,244
Population density per area (km²)	2,492	10,809	11,950	4,481	4,570
Public toilets (total#)	168	616	324	264	168
#Public toilet per area (km²)*	0.60	0.79	1.44	0.76	0.26
#Public toilet per 100,000 residents**	24.10	7.31	12.04	16.98	5.76

Note1. CT=Census tract; n= the unit area (borough, ward, or CT); the number of CTs in the 5 boroughs of NYC is 2,164; #=the count/number of public toilets; *toilet density per area (km²); **toilet density per population

FIGURE 2

Table 2. Characteristics of Cities with Toilets in Open Spaces

	Berlin (n=12)	Brussels (n=20)	London (n=34)	Paris (n=12)	Seoul (n=23)	Sydney (n=15)
Total population	3,670,622	1,187,890	8,787,892	2,254,262	10,124,579	5,029,768
Total area (km²)	891.12	161.38	1,572	105.37	605.2	12,368
Mean area (km²/n)	74.26	8.07	46.24	8.78	26.31	824.53
Mean Population per area	305,885	59,395	258,467	187,855	440,199	335,318
Population density per area (km²)	4,119	7,361	5,590	21,394	16,729	407
Public toilet (total #)	175	37	738	394	1,276	2,755
#Public toilet per area (km²)*	0.20	0.23	0.47	3.74	2.11	0.22
#Public toilet per 100,000 residents**	4.77	3.11	8.40	17.48	12.60	54.77

Note2. n= the unit area (Bezirke, commune, borough, arrondissement, Gu, or Statistical areas-level 4); #=the count/number of public toilets; *toilet density per area (km²); **toilet density per population

REFERENCES

1. Greed C. Inclusive urban design: Public Toilets. Oxford, UK: Architectural Press; 2003.
2. Wagg AS, Newman DK, Leichsenring K, van Houten P. Developing an internationally-applicable service specification for continence care: systematic review, evidence synthesis and expert consensus. PloS one. 2014; 9(8):e104129. doi: 10.1371/journal.pone.0104129

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EFFICACY AND MECHANISM OF ELECTRICAL PUDENDAL NERVE STIMULATION IN TREATING POST-RADICAL PROSTATECTOMY URINARY INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

Electrical pudendal nerve stimulation (EPNS) combines the advantages of pelvic floor muscle (PFM) training (PFMT), transanal electrical stimulation (TES) and pudendal neuromodulation and incorporates the technique of deep insertion of long needles [1,2]. The aim of this original study was to assess the efficacy of EPNS versus biofeedback (BF)-assisted PFMT plus TES in treating post-radical prostatectomy (PRP) urinary incontinence (PRPUI) and explore its mechanism of action by simultaneous recordings of perineal ultrasonographic PFM movements and pelvic floor surface electromyogram.

STUDY DESIGN, MATERIALS AND METHODS

According to the result of a pilot study the required sample size was calculated to be 92 patients for a power of 0.90, an α of 0.05 and a ratio of 2:1. Of 126 PRPUI men assessed for eligibility, 96 were enrolled in study from October 2014 to Jan 2017. They were randomized, through drawing lots at a ratio of 2:1, to group (64 cases) and group (32 cases). Study inclusion criteria were urinary incontinence at 1 month or more after radical prostatectomy (RP), ≥2 incontinence episode a week on baseline 7-day bladder diary and no residual cancer after RP. Exclusion criteria were the presence of preoperative urinary incontinence, treatment with anticholinergics, urinary tract infection, hematuria, postvoid residual volume >100 ml, neurological disorders and urethral stricture. Group was treated with EPNS as described previously [1,2]. Four sacrococcygeal points were selected for deep insertion of long acupuncture needles used as electrodes. The two upper points are located about 1 cm bilateral to the sacrococcygeal joint. A 0.40 X 100 mm needle was inserted perpendicularly to make the needle tip reach the vicinity of the main trunk of the pudendal nerve (PN).The locations of the two lower points are about 1 cm bilateral to the tip of the coccyx. A 0.40 X 100 or 125 mm needle was inserted obliquely toward the ischiorectal fossa to make the needle tip reach the perineal nerve (PN branch). Electrical stimulation with a biphasic 2-millisecond pulse duration was provided at a frequency of 2.5 Hz and an intensity of 45~55 mA. Strong rhythmic and cephalad PFM contraction around the root of the penis must be maintained during the entire electrostimulation. EPNS was given 60 minutes 3 times per week for a total of 8 weeks. Group was treated by BF-assisted PFMT and following TES at a current intensity of < 60 mA and alter-

nate frequencies of 15 Hz and 85 Hz, 40 minutes (20 minutes each) 3 times a week for a total of 8 weeks. Group patients also conducted 30 maximal high-intensity PFM contractions for 2-6 seconds, 3 sessions every day at home for a total of 8 weeks. The total time of treatment was basically the same in the two groups. Simultaneous recordings of perineal ultrasonographic PFM contraction (movement) and pelvic floor surface electromyogram were made during EPNS or active PFMT in the first 10 patients of group or group . The primary outcome measure was the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF), which contains three scored items assessing the frequency of leakage, amount of leakage and quality of life. The secondary outcome measure was the number of used incontinence diapers. The ICIQ-UI SF questionnaire was completed and the number of used incontinence diapers was reported by all patients after treatment completion or discontinuation. Outcome assessors were blinded to group assignment. The outcome analysis used an intention-to-treat approach. The Wilcoxon signed rank test and Mann-Whitney U test were used for analysis of the ICIQ-UI SF score and subscores, the incontinence diapers score and the results of the simultaneous recordings.

RESULTS

At baseline there were no significant differences in age (68.5±6.5 vs 67.0±6.7), symptom duration (median 4.5 (range 1.0-65.5) vs 4.5 (range 1.0-30.5) months), the ICIQ-UI SF score (median 18 (IQR 16-19) vs 18 (IQR 15.25-20)) and subscores, and the incontinence diapers score (median 3 (IQR 3-4) vs 4 (IQR 3-4)) between groups and (all $p>0.05$). At the end of treatment, the median ICIQ-UI SF score decreased to 11 (IQR 7-14) in group and 15 (IQR 9-17) in group (both $p<0.01$); the median incontinence diapers score decreased to 3 (IQR 1-3) in group and 3 (IQR 3-4) in group (both $p<0.01$). The ICIQ-UI SF frequency of leakage, amount of leakage and quality of life subscores also decreased in the two groups at the end of treatment ($p<0.05$ or $p<0.01$). Posttreatment ICIQ-UI SF score, incontinence diapers score, amount of leakage subscore and quality of life subscore were significantly lower in group than in group (all $p<0.05$) (table 1). The ICIQ-UI SF score-based improvement rate was significantly higher in group (a median of 36.8 (IQR 21.1-53.8, range 5.9-100) %) than in group (a median of 16.2 (IQR 10.1-41.9, range 0-71.4) %) ($p<0.01$). Four group patients and three group patients discontinued treatment ahead of time. Simultaneous recordings showed: (1) B-mode cranio-caudal PFM movements were obviously visible during EPNS and PFMT; (2) M-mode PFM movement amplitude was >0 mm - <3 mm during EPNS and PFMT, and there was no significant difference in the amplitude between EPNS (≥1mm in all 10 patients) and PFMT (≥1mm in 8 of 10 patients) ($p=0.69$) (fig.1 A and C); (3) pelvic floor electromyogram was sawtooth waves with a median amplitude of 235.3 (IQR 157.0-324.5) mV during EPNS and continuous triangular waves with a median amplitude of 16.9 (IQR 8.6-53.2) mV during PFMT, and there was a significant difference in the amplitude between EPNS and PFMT ($p<0.01$) (fig. 1 D).

INTERPRETATION OF RESULTS

Perineal PFM movement amplitude during EPNS was similar to that during PFMT, indicating that EPNS can excite the PN and simulate PFMT in PRPUI patients. Posttreatment ICIQ-UI SF score and incontinence diapers score were significantly lower (both $p<0.05$) and improvement rate was significantly higher ($p<0.01$) in group than in group , indicating that EPNS is more effective than BF-assisted PFMT plus TES in treating PRPUI. There is a statistically significant post-treatment differences in the amount of leakage subscore ($p<0.05$) but not in the frequency of leakage subscore ($p=0.68$) between the two groups, indicating that a short-term (8 weeks) EPNS is more effective than BF-assisted PFMT plus TES in reducing the amount of leakage and not in decreasing the frequency of leakage in PRPUI patients. The reason why EPNS has a better therapeutic effect may be that EPNS, when performed correctly, can ensure a most effective PFM contraction at every stimulus during the entire electrostimulation in comparison with PFMT done by the patient. On the other hand, EPNS can produce the contractions of all PFMs supplied with the PN and stimulate PN afferents directly by the arrival of the needle tip at the nerve in comparison with TES that mainly produces local perianal PFM contractions and stimulates PN afferents indirectly through the wall of the anal canal because it uses an anal surface electrode.

CONCLUDING MESSAGE

EPNS is more effective than BF-assisted PFMT plus TES in treating PRPUI. Its mechanism of action is that EPNS can excite the PN and simulate PFMT to strengthen the urethral sphincter for the treatment of PRP stress incontinence and to probably inhibit hyperactivity of the micturition center and detrusor overactivity for the treatment of PRP urgency incontinence.

FIGURE 1

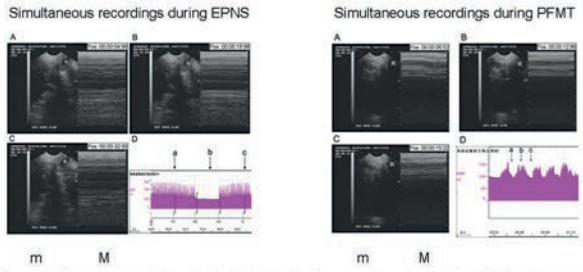

Figure 1: R=rectum, m=M-mode line, M=M-mode image; a, b and c in picture D=the times corresponding to image A, B and C

FIGURE 2

Table 1 Comparisons of pre-treatment and post-treatment ICIQ-UI SF scores, leakage frequency subscores, leakage amount subscores, quality of life subscore and number of incontinence diapers scores between groups Ⅰ and Ⅱ

	ICIQ-UI SF score	Leakage frequency subscore	Leakage amount subscore	Quality of life subscore	Number of incontinence diapers score
	Before treatmene (baseline) median (IQR)				
Group Ⅰ (n=64)	18 (16-19)	4 (4-5)	6 (6-6)	8 (6-9)	3 (3-4)
Group Ⅱ (n=32)	18 (15.25-20)	4 (4-5)	6 (6-6)	8 (6-9)	4 (3-4)
P value	0.68	0.58	0.49	0.42	0.40
	After treatment median (IQR)				
Group Ⅰ (n=64)	11 (7-14)	4 (3-4)	4 (2-6)	3 (2-5)	3 (1-3)
Group Ⅱ (n=32)	15 (9-17)	4 (4-4)	6 (2-6)	5 (2.25-7)	3 (3-4)
P value	<0.05	0.68	<0.05	<0.05	<0.05

REFERENCES

1. Wang S, Lv J, Feng X, Wang G, Lv T. Efficacy of electrical pudendal nerve stimulation in treating female stress incontinence. Urology. 2016; 91:64-9.
2. Wang S, Lv J, Feng X, Lv T. Efficacy of electrical pudendal nerve stimulation versus transvaginal electrical stimulation in treating female idiopathic urgency urinary incontinence. J Urology. 2017; 197:1496-1501.

Funding Grant 09dZ1974900 from the Shanghai Municipal Science and Technology Commission and grant ZYSNXD-CC-ZDYJ010 from the Shanghai Municipal Health Bureau. **Clinical Trial** Yes **Registration Number** ClinicalTrials.gov, NCT02599831 **RCT** Yes **Subjects** Human **Ethics Committee** IRB of Yueyang Hospital of Integrated Traditional Chinese and Western Medicine, **Helsinki** Yes **Informed Consent** Yes

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MULTIVARIATE ANALYSIS OF VARIANCE FOR MAXIMISING THE DIAGNOSING ACCURACY IN DIFFERENTIATING DU FROM BOO IN MALES

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HYPOTHESIS / AIMS OF STUDY

Detrusor underactivity (DU) and bladder outlet obstruction (BOO) bother almost half of elder men. Although the treatment is different for these two lower urinary tract symptoms, invasive pressure flow studies remains the only gold standard for diagnosing both. To non-invasively differentiate DU from BOO, a few studies have mathematically analysed urine flow rate curve and proposed promising parameters [1,2], but each proposed parameter is not strong enough for diagnostic usage. Therefore, in this study we aim to use multivariate analysis of variance on parameters derived from free flow data to assess the possibility of non-invasive differentiating DU from BOO in males.

STUDY DESIGN, MATERIALS AND METHODS

Free-flow data of 273 adult male patients who had also undergone PFS were analysed in this research. Based on their PFS record, these patients are divided into three groups: 104 BOO, 93 DU, and 76 normal (DU and BOO disease free) for reference. All free flow data has pre-processed by threshold value of 0.5ml/s for the start and end micturition point [3].

The multivariate analysis is performed by bundling multiple dependent variables into a weighted linear combination variable to achieve the best statistically significant between two groups. The following non-invasive variables which have significant statistical difference between two groups, are employed for multivariate analysis:

1. Parameters obtained from 2 seconds averaging window filtered urine flow rate data, including Qmax ($P<0.0001$), Qave by voiding time ($P<0.01$), Qave by flow time ($P<0.0001$) and ratio of Qmax time to voiding time ($P=0.05$).

2. Parameters mathematically derived from 2 seconds averaging window filtered urine flow rate data, including mean flow rate in rising part and falling part ($P<0.01$ and $P=0.01$ respectively), and ratio of flow time to voiding time.

3. Parameters required complex mathematically calculation of raw flow data, including median frequency values in different bandpass filtered curve (statistical difference varies from $P=0.0001$ to $P<0.05$), ratio values of peak numbers in different lowpass filtered curve ($P<0.0001$), time constant value in falling part of 2 seconds averaging window filtered curve ($P=0.01$), and sum of amplitude changes in rising slope in 0.1Hz to 1Hz filtered flow curve ($P<0.001$).

Then the inputted parameters are assigned with coefficients each and summed to create a variable which has the best diagnosing accuracy on differentiating DU with BOO.

Non-invasive parameters were derived in Matlab 2017a. All statistical analysis was performed in SPSS version 24, Mann-Whitney U test and T-student test were performed as appropriate. A statistically significant difference was considered as P value<0.05.

RESULTS

The variable calculated in multivariate analysis has significantly statistical difference between DU with BOO groups, with P value less than 10-22. The area under the curve in receiver operation characteristic analysis is 0.872, which is presented as in figure 1, the most balanced sensitivity and specificity for the new variable are 73.1% and 84.6% respectively on differentiating DU from BOO.

Figure 1 Area under curve for new variable on differentiating DU with BOO

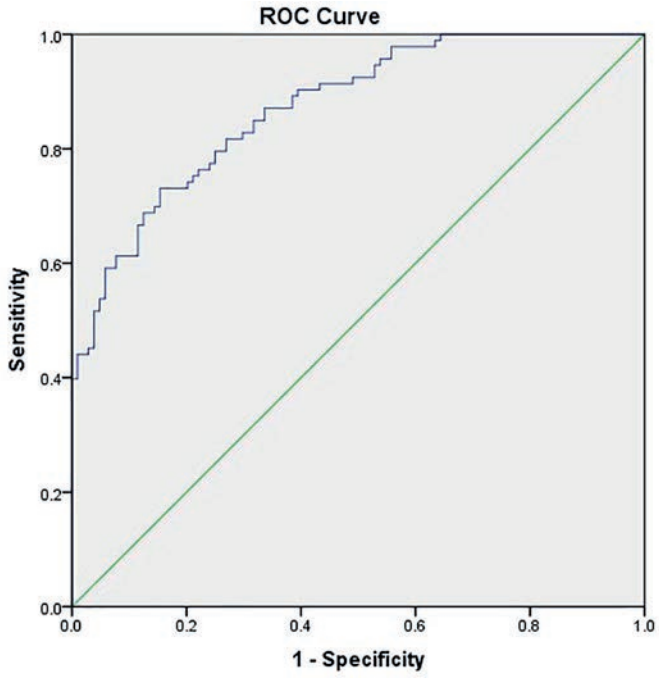
INTERPRETATION OF RESULTS

The result shows that multivariate analysis could improve the diagnosing accuracy, by mathematical linear combining the inputted parameters. While the single variable could have limited diagnosing power, such as Qmax with P<0.0001 only having area under curve value of 0.634, the combination of these non-invasive parameters shows promise on differentiating DU from BOO. Moreover, the diagnosing accuracy could possibly be further improved if any other non-invasive parameter is employed. However, it should be noted that the current result is only valid in training procedure, and a larger data number is needed for validation before diagnostic use.

CONCLUDING MESSAGE

In this study, we found the multivariate analysis could improve the diagnosing accuracy by combining parameters which have statistical difference between DU and BOO groups, and presented the possibility to non-invasively differentiate DU with BOO only by analysing the flow rate data alone. Further research will focus on explore other parameters which could serve as additional indicators for differentiating two symptoms, and other classification methods such as neural network and classification/regression tree analysis.

FIGURE 1



REFERENCES

1. Li R, Gammie A, Zhu Q, and Nibouche M. Mathematical modelling analysis of male urine flow trace. International Continence Society 2016 conference, Japan. Poster 144.
2. Kwon SL, Phil HS, Young HK. Does uroflowmetry parameter facilitate discrimination between detrusor underactivity and bladder outlet obstruction? Investig Clin Urol 2016; 57(6):437–441
3. Gammie A, Yoshida S, Steup A, Kaper M, Dorrepaal C, Kos T, Abrams P. Flow time and voiding time – definitions and use in identifying detrusor underactivity. Neurourol Urodyn. 2016;35:s68.

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IS THE STRONG DESIRE TO VOID A SOURCE OF DIVERTED ATTENTION IN HEALTHY VOLUNTEERS?

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HYPOTHESIS / AIMS OF STUDY

It is well recognised that continence is not an automatic process but rather a learned skill under both conscious and subconscious control. Research in neuroimaging has led to evidence that no one part of the brain controls continence; several parts are involved its control and both excitatory and inhibitory signals are required in bladder function. There is some evidence that the strong desire to void may impact cognitive function. Lewis et al. used the strong desire to void as a model for pain, and found that the strong desire to void caused deterioration in cognitive performance in adults without lower urinary tract issues. (1) In addition, a study by Tuk et al. found that inhibition in visceral domains such as bladder control can lead to increased inhibition in terms of self-control for decision making. (2) This suggests that maintaining continence requires cognitive input. We hypothesise that the sensation of a strong desire to void in healthy volunteers would cause deterioration in the performance of two cognitive tests, and that this deterioration would be similar to that induced by the simultaneous performance of another cognitive task which is known to act as a source of diverted attention, the 2-back test, in which the subject is read a list of letters in a random order and indicates when the letter given is the same as the letter given 2 positions previously in the sequence.

STUDY DESIGN, MATERIALS AND METHODS

Volunteers aged 18 or older recruited via posters placed around the University campus. Study participants had no significant LUTS, defined as a a score of less than four on the bladder self-control assessment questionnaire (BASQ), an absence of neurological disease that may affect cognition, no significant visual hearing or visual impairment that would prevent completion of the cognitive task, and did not use an intermittent or indwelling urinary catheter, or require dialysis. Following informed consent, participants completed two cognitive tests, the Trail Making B test (TMT-B) and a computer based test of simple reaction time (SRT).

The TMT-B is a validated test of executive function, and comprised participants linking 25 circles in alternating number-letter order (1 -> A -> 2 -> B...), while the SRT involved

pressing a mouse button as quickly as possible after a visual signal was given. For the TMT-B the time taken to complete the test was recorded. For the SRT, the test was completed five times and the mean time recorded. The participants completed each test under three conditions; undistracted and with an empty bladder, distracted by simultaneously completing the n-back test, and while experiencing a strong desire to void. To reduce learning effects each participant was given two practice runs at the tests and the state under which data were collected was in a random order.

Strong desire to void was induced by drinking uncaffeinated and non-alcoholic fluids ad libitum until the participant experienced the strong desire to void. They were instructed to postpone voiding until their desire to void reached the level at which they would leave a movie theatre during the film to pass urine and were unable to "hold on" any further.

The time taken to complete each cognitive test was recorded and student's T test used to compare the undistracted state to the distracted and strong desire to void.

RESULTS

26 participants (18 female, 8 male, mean age 22 years) were recruited and completed data collection. There were no dropouts.

Trail Making B Test

In the undistracted state, the mean time taken to complete the TMT-B was 43.3 seconds (SD 19.01). The time taken to complete the test while distracted was significantly higher at 110.6 seconds (SD 56.38), $p<0.001$. The time taken while experiencing a strong desire to void was 44.29s (SD 13.17), which was not significantly different to the undistracted state.

Simple Reaction Time

The mean reaction time when undistracted was 371.9ms (SD 58.04). While distracted, the reaction time was significantly higher, at 624.8ms (SD 250.8), $p<0.001$. When experiencing a strong desire to void, the reaction time was significantly slower than when undistracted at 421ms (SD 83.6), $P<0.05$

INTERPRETATION OF RESULTS

The experience of a strong desire to void induced a small but significant increase in reaction time in our group of young, healthy volunteers without lower urinary tract symptoms, which is in accordance with the findings of Lewis et al. This effect was similar but of a lesser magnitude than the reduction induced by a simultaneous distracting task, and implies that, in healthy volunteers, the strong desire to void may act as a source of diverted attention.

CONCLUDING MESSAGE

Our results suggest that the strong desire to void can impair cognitive performance even in young, healthy people. This has implications for situations in which people are undertaking tasks which rely on reaction time and when toileting facilities are not available, such as driving, and suggests that the sensation of strong desire to void affects the function of other domains of cognition.

In older adults, there is a significant association between falls and urinary urgency, and the effect on cognition via distraction has been suggested to be a possible causal factor in this association (3). Future work will investigate whether a similar or greater effect in older adults and in people with symptomatic LUTS. This work has shown that in even young, healthy people with no overt neurological or lower urinary tract dysfunction, the sensation of a strong desire to void can induce changes in cognitive performance.

REFERENCES

1. Lewis MS, Snyder PJ, Pietrzak RH, Darby D, Feldman RA, Maruff P. The effect of acute increase in urge to void on cognitive function in healthy adults. Neurourology and Urodynamics 2011;30(1):183-187.
2. Mirjam A. Tuk, Debra Trampe, Luk Warlop. Inhibitory spillover: Increased urination urgency facilitates impulse control in unrelated domains. Psychological Science 2011;22(5):627-633
3. Gibson W, Hunter K, Camicioli R, Booth J, Skelton D, Dumoulin C, Paul L, Wagg A. The association between lower urinary tract symptoms and falls: forming a theoretical model for a research agenda. Neurourology and Urodynamics 2017;9999: 1-9

Funding University of Alberta **Clinical Trial** No **Subjects** Human **Ethics Committee** University of Alberta Research **Ethics Committee Helsinki** Yes **Informed Consent** Yes

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MULTIPLE SCLEROSIS AND URINARY VOIDING SYMPTOMS. A DEDICATED VOIDING SCORE.

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HYPOTHESIS / AIMS OF STUDY

Multiple sclerosis (MS) patients develop lower urinary tract symptoms (LUTS) during the progression of their disease. Disease severity and urinary filling symptoms can be assessed through many validated scores like EDSS and OABSS (1). The scarcity of dedicated voiding symptom scores in the neurological population has led us to screen and test the correlation between urinary voiding symptoms and the disability score in MS patients. The aim of this study is to assess the possibility of establishing a new voiding symptom score correlating to the patients' disability.

STUDY DESIGN, MATERIALS AND METHODS

40 patients with MS and LUTS were recruited between July and November 2017. Patients who have other causes for their urinary symptoms such as benign prostatic hypertrophy, urethral stenosis, bladder cancer, prostate cancer or a history of urological surgeries were excluded from the study. Information on disability (using EDSS : Expanded Disability Status Scale) and all voiding LUTS (using a scoring system similar to that of IPSS: International Prostate Symptom Score) was gathered through questionnaires during personal interviews. Correlation was studied using bivariate correlation test to measure the linear relation between variables.

RESULTS

40 Patients were equally divided between genders, with an age of 43 ± 10 years, a mean MS duration of 11.6 ± 8 years and mean duration of urinary symptoms of 6.4 ± 6 years. Mean EDSS was 3.9 ± 2. EDSS had a moderate positive correlation with straining (r=0.34), intermittency (r=0.26) and slow stream (r=0.25), in that order, while having a weak positive correlation with terminal dribble (r=0.198), hesitancy (r=0.127), and feeling of incomplete emptying (r=0.12), in that order. The positive correlation with straining was the only significant one (p=0.03). After combining the first three symptoms in the IPSS-3V score, there was also a moderately positive correlation with EDSS (r=0.393) that was statistically significant (p=0.01).

INTERPRETATION OF RESULTS

The average EDSS in our study was lower than what is usually found in other studies on MS mainly because many patients came from distant regions which might have encouraged more independent subjects to participate in this study. All voiding symptoms showed positive correlation with EDSS, however it wasn't a strong correlation and, in most cases, not significant. Straining showed the strongest correlation as an individual voiding symptom and it was statistically significant. The three voiding symptoms combined in the IPSS-3V (straining, intermittency and slow stream) correlated the most with the severity of MS, showing that MS progression affects mainly these three symptoms. The IPSS-3V showed a stronger significant correlation than that of any individual voiding symptom. No previous studies has shown such a correlation with a specific set of voiding symptoms.

CONCLUDING MESSAGE

MS progression affects all voiding LUTS to different extents. The severity of voiding LUTS increases with disease progression, especially straining. The combination of straining, intermittency and slow stream in a new score IPSS-3V seems to be a promising index for voiding LUTS severity in MS patients. No previous studies have shown such a correlation between MS severity and a dedicated voiding score.

FIGURE 1

	Straining	**Intermittency**	**Slow stream**	Terminal dribble	Hesitancy	Incomplete emptying	**IPSS-3V**
Pearson correlation	0.34	0.26	0.25	0.198	0.127	0.12	0.393
Significance	**0.03**	0.10	0.12	0.22	0.43	0.46	**0.01**

REFERENCES

1. Akkoç Y, Ersöz M, Yüceyar N, Tunç H, Köklü K, Yoldas TK, Dönmez Ü, Uzunköprü C, Alemdaroglu E, Bilen S, Emre U, Özdolap S, Tuncay E, Yücesan C, Gök H, Ercan MB, Uygunol K, Koçer B, Zinnuroglu M; Neurogenic Bladder Turkish Research Group. Overactive bladder symptoms in patients with multiple sclerosis: Frequency, severity, diagnosis and treatment. J Spinal Cord Med. 2016;39(2):229-33.

Funding Saint Joseph University, Beirut, Lebanon **Clinical Trial** No **Subjects** Human **Ethics Committee** Comite d'ethique de l'universite saint joseph **Helsinki** Yes **Informed Consent** Yes

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TRENDS IN BLADDER AUGMENTATION PRIOR TO AND AFTER INTRODUCTION OF ONABOTULINUM TOXIN A THERAPY IN NEUROGENIC BLADDER POPULATION

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HYPOTHESIS / AIMS OF STUDY

Augmentation enterocystoplasty is an effective and safe long term management option for patients with neurogenic bladder and diminished bladder compliance. It is a major reconstructive procedure and carries a significant risk of perioperative and post-operative complications. With the introduction and FDA approval of Onabotulinum Toxin A (BTX-A) for use in neurogenic bladder in 2011 many patients with impaired bladder compliance are able to try this therapy and delay the need for bladder augmentation. The aim of the study was to determine if there has been a change in the rates of bladder augmentation use for patients with neurogenic bladder over the last 11 years encompassing the FDA approval of BTX-A for neurogenic bladder indication. We hypothesize that BTX-A limits the need for bladder augmentation and thus there has been a decline in the rates of augmentation enterocystoplasty.

STUDY DESIGN, MATERIALS AND METHODS

The electronic medical records and billing data was queried to extract the number of bladder augmentations and BTX-A injections done each year for the last 11 years at a single academic center. Study included patients greater then 18 years of age who had an office visit with a urology provider from 1/1/2007 to 1/1/2018 and had a diagnosis of neurogenic bladder. Bladder augmentation procedures were identified by CPT codes 51960, 51800 and BTX-A injection procedures were identified by CPT 52287, 53899.1, 52327, 52214 codes. Total number of patient visits per year with neurogenic bladder diagnoses seen by urology providers was used to adjust for the increasing volume of patients evaluated.

RESULTS

There were a total of 3303 adult patients with neurogenic bladder diagnoses evaluated at 9867 distinct encounters at a single center over 11 years. Ninety-two of those patients underwent a bladder augmentation based on CPT data. The procedures were reviewed to confirm that billing data was consistent with the actual procedure performed and 21 patients were excluded as they did not have augmentation enterocystoplasty. The final cohort was 54.5% (39/71) female and median age was 36 years (range 21- 66). The raw number of bladder augmentations for neurogenic bladder done at a single center fluctuated from 3 to 13 per year from 2007 to 2017 (Figure 1-a). When the total number of augmentations was adjusted for the number of visits with urology providers for neurogenic bladder the proportion of augments per year decreased from 1.40% (25/1791) in years 2007-2009 to 0.41% (15/3695) in 2015-2017 (OR 3.78, 95%CI 1.80 to 6.53, $p < 0.001$) (Figure 1-b). BTX-A billing data was available starting in 2012 and the number of BTX-A injections per year increased from 61 in 2012 to 341 in 2017 (Figure 1-a). The proportion of visits for BTX-A injections in neurogenic bladder cohort has steadily increased from 7.57% (61/806) in 2011 to 17.0%(341/2002) in 2017 (OR=0.44, 95%CI 0.33-0.59, $p < 0.001$) (Figure 1 - b).

INTERPRETATION OF RESULTS

The raw number of bladder augmentations per year has remained constant over the last 11 years but the rate of bladder augmentation per neurogenic bladder patient encounter has declined dramatically at a single institution. The number and rate of BTX-A use for patients with neurogenic bladder has increased since its approval in 2011 indicating a shift in management algorithm in patients with neurogenic bladder.

CONCLUDING MESSAGE

This study encompasses the era of the FDA approval of BTX-A use for neurogenic bladder and, while this is limited to billing data at a single institution, it confirms that rates of bladder augmentation are declining and rates of BTX-A use in neurogenic bladder are increasing dramatically. Further longitudinal and multi-institutional data is needed to determine if these trends hold true at the national level and to identify whether BTX-A offers a temporary delay to bladder augmentation or if it is a permanent long term solution for patients with neurogenic bladder and impaired compliance.

FIGURE 1

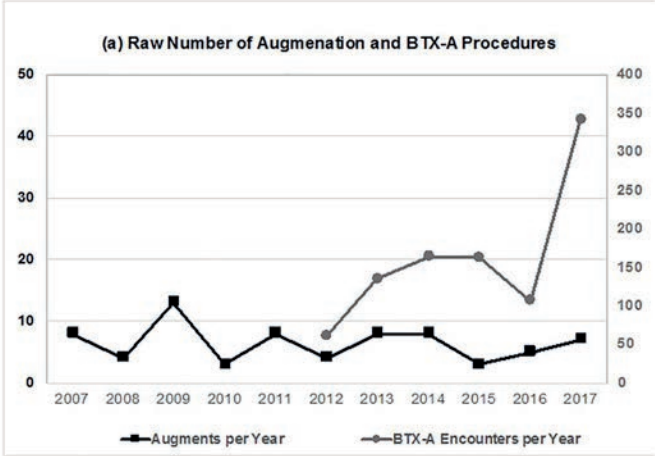
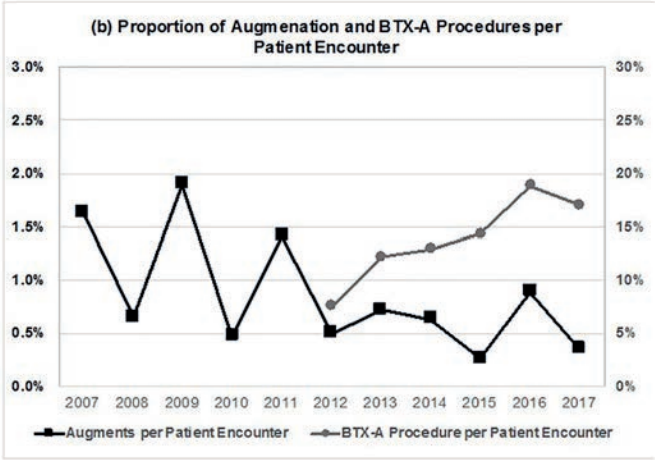


FIGURE 2



Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** IRB **Helsinki** Yes **Informed Consent** No

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IMPACT OF STIMULATION PARAMETERS ON SENSORY EVOKED POTENTIALS OF THE LOWER URINARY TRACT

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HYPOTHESIS / AIMS OF STUDY

Previous studies demonstrated the feasibility of sensory evoked cortical potential (SEP) recordings for electrical stimulation of the human lower urinary tract (LUT) with heterogeneous methodologies and results. The aim of the current study was to evaluate the impact of different stimulation parameters (i.e. frequency and number of stimuli) on mean amplitudes and latencies of LUT SEPs in order to refine the methodology for efficient evaluation of viscero-sensory af-

ferent pathways of the LUT. We hypothesized that higher stimulation frequencies would lead to smaller amplitudes, while no changes in latencies would be expected. The amplitudes were expected to decrease in the course of a stimulation cycle.

STUDY DESIGN, MATERIALS AND METHODS

After local ethics committee approval, 40 healthy subjects (age: 23.3±3.3 years) were included. Electrical stimulation of different frequencies (0.5Hz, 1.1Hz, 1.6Hz) was randomly applied at the bladder dome (group: 10 females, 10 males) or proximal urethra (group: 10 females, 10 males) using a 14Ch custom-made catheter. Prior to each measurement, the bladder was filled with 60mL of contrast medium and stimulation intensity was increased as far as tolerable without being painful. Five consecutive runs, each with 100 electrical stimuli, were applied. SEPs were recorded from surface electrodes at Cz referenced to Fz and filtered using bandpass (0.5Hz-70Hz) and notch filter. All measurements were repeated in a second visit using the same order of frequency assessments. Linear mixed models with within-subjects factors frequency and visit and between-subjects factors location and gender were adjusted for stimulation intensity to avoid potential confounding. To compare the individual runs, only subjects with stable SEPs in all five runs were included. A SEP was considered stable when the SEP odd and even runs were in parallel and the components P1, N1 and P2 were clearly identifiable visually.

RESULTS

Across 500 stimuli, stable LUT SEPs with 100% responder rate and the three main components P1, N1, and P2 were recorded for all frequencies, locations, and visits. Linear mixed model revealed significant influence of stimulation frequency on P1N1 ($F(2,96)=5.32$, $p=0.006$) and P2N1 ($F(2,89)=7.83$, $p<0.001$) amplitudes, but not on the latencies of P1, N1, and P2. Mean amplitudes decreased by increasing stimulation frequency (P1N1- 0.5Hz: 5.1±2.8µV, 1.1Hz: 3.8±2.1µV, 1.6Hz: 3.3±2.0µV; P2N1- 0.5Hz: 9.8±5.0µV, 1.1Hz: 7.3±4.0µV, 1.6Hz: 6.4±3.7µV). No significant effect was found for stimulation intensity, location and visit. Considering runs separately, decreasing amplitudes were observed from run 1 to 5 ($P1N1:F(4,481)=14.47$, $p<0.001$; $P2N1:F(4,481)=21.09$, $p<0.001$) accompanied by decreasing responder rate. However, by summation of runs, the responder rate could be further increased compared to the first run.

INTERPRETATION OF RESULTS

SEPs could be recorded in the LUT with all three frequencies. Higher frequencies resulted in reduced SEP amplitudes, indicating that the choice of the stimulation parameters is crucial. Lower stimulation frequencies such as 0.5Hz might lead to larger amplitudes because of a better susceptibility of the slow fibers in the LUT to these frequencies compared to higher frequencies. The gradual decrease in amplitude and responder rate across runs suggests that the total number of runs (=number of stimuli) can be reduced in order to achieve reliable LUT SEPs and at the same time reducing acquisition time. We assume that habituation respectively rapidly changing bladder volumes leading to electrode dislocation may cause this observed decrease in amplitudes. The size of the peak-to-peak amplitudes is important since LUT SEPs with bigger amplitudes are better detectable and thereby marker setting of P1, N1, P2 gets frequently easier.

CONCLUDING MESSAGE

We could successfully record SEPs from different locations in the LUT with a very high responder rate and systematically evaluate the impact of several stimulation parameters on LUT SEP outcome. The choice of the stimulation parameters is very relevant for implementation of LUT SEPs into daily clinical practice. Based on the current results, we would recommend applying the slowest stimulation frequency 0.5Hz, because of the biggest amplitudes, but one could reduce the number of electrical stimuli to 200 (2 runs of 100 stimuli) to achieve a faster acquisition of reliable SEPs. This constitutes a good compromise between the duration of a stimulation cycle and peak-to-peak amplitudes of the SEP. Further studies including patients are needed.

Funding Swiss National Science Foundation **Clinical Trial** Yes **Registration Number** NCT02272309 **RCT** No **Subjects** Human **Ethics Committee** KEK Zürich **Helsinki** Yes **Informed Consent** Yes

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THE IMPACT OF BACK PAIN AND BACK SURGERY ON THE OUTCOME OF SACRAL NEUROMODULATION TESTS

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HYPOTHESIS / AIMS OF STUDY

To evaluate the impact of previous back pain, spinal infiltration or radio frequent denervation procedures (SIDP) and back surgery on the outcome of sacral neuromodulation (SNM) using percutaneous nerve evaluation (PNE) and tined lead procedure (TLP).

STUDY DESIGN, MATERIALS AND METHODS

All patients who underwent test stimulation for sacral neuromodulation between October 2011 and December 2016 were retrospectively included in our database. Medical files were thoroughly searched for primary indication of SNM, history of back pain, SIDP and major back surgery (all subdivided in cervical, thoracic or lumbosacral problems). The outcome of the test stimulation was evaluated and those with >50% improvement in the predominant complaint (incontinence/urgency/frequency/residual urine/CIC) were considered a success and proceeded to IPG implant. Chi-square analysis was used to compare implant rate between groups.

RESULTS

Of 128 patients who underwent test stimulation (95,3% TLP; 4,7% PNE), 82 (64,1%) received an implantable pulse generator .

Mean age was 53,16 ± 16,00 years and 80,3% were female.

Primary indications for SNM were idiopathic overactive bladder(OAB) dry: 8,6%, OAB wet: 51,6%, non-obstructive urinary retention (NOUR): 22,7% and OAB or retention due to neurogenic bladder: 17,2%. Back complaints were present in 52 patients (40,6%%; 13,5% cervical, 5,8% thoracic, 53,8% lumbosacral, 19,2% multiple complaints and 7.7% unspecified). Of these, back surgery and/or SID was performed in 34 patients (26.6%: 17.6% cervical surgery, 17.6% lumbosacral SID, 47.1% lumbosacral surgery, 14.7% multiple procedures and 2.9% unspecified). The other 76 (59,4%) constituted the control group.

No statistical difference in mean age, the distribution of sex and the prevalence of primary indications were withheld between the control group and group with backpain and prior back surgery, respectively (p=0,072 and p=0,093, p=0,729 and p=0,877, p=0,385 and p=0,764).

Chi-square analysis showed no significant difference in implant rate between the control group (67,1%) and the group with back complaints (59,6%) (p=0,386) nor between the control group and the group with prior back surgery (58,8%) (p=0,458).

Also, no significant difference in implant rate was noted between groups when stratified according to the location of back pain (p=0,586), the location of back surgery and/or SIDP (p=0,788) and the primary indication for SNM (p=0,386, p=0,458).

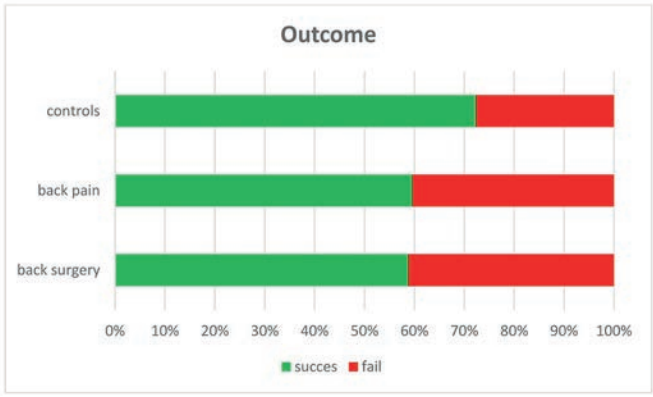
INTERPRETATION OF RESULTS

A large number of SNM patients have back complaints and/or prior back surgery. Although the patients without back pain, SIDP and/or back surgery had a higher implant rate compared to those with, no statistical difference could be withheld, possibly due to a relative small sample size. However, the majority of patients with backpain, SIDP and/or prior back surgery proceeded to a definitive implant. In addition, the outcome appears to be independent of the location of the back pain or surgery and the primary indication for SNM.

CONCLUDING MESSAGE

SNM seems to be a valid treatment option in patients with prior back pain or back surgery.

FIGURE 1



Funding None **Clinical Trial** Yes **Public Registry** No **RCT** Yes **Subjects** Human **Ethics Committee** Committee for Medical Ethics UZA-UAntwerp **Helsinki** Yes **Informed Consent** Yes

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NAVIGATION OF A TINED LEAD ELECTRODE USING A THREE-DIMENSIONAL (3D) MODEL OF SACRAL MORPHOMETRY – A NEW IMPLANTATION TECHNIQUE FOR SACRAL NEUROMODULATION

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HYPOTHESIS / AIMS OF STUDY

Sacral neuromodulation is an effective treatment method for lower urinary tract dysfunction. It is most often performed by placing a tined lead electrode in the third sacral (S3) foramen. To identify the third sacral foramen, many authors use bony landmarks that are not always visible on fluoroscopy. A detailed analysis of the topological properties of the S3 foramen with surrounding bone landmarks can improve the technique of implantation and tined lead electrode positioning. Three-dimensional (3D) technology enables fast and accurate implantation of the electrode and eliminates exposure of the patient and healthcare staff to radiation. The aim of the study was to examine the 3D sacral morphometry of the third sacral foramen and to develop a method of 3D implantation of the tined lead electrode for sacral neuromodulation.

STUDY DESIGN, MATERIALS AND METHODS

Patients who had undergone abdominal CT scanning were randomly assigned to the prospective study group. The Image Archiving and Communications System and Digital Imaging and Communications in Medicine (DICOM) were used for image processing. Randomization was performed by the random selection of every 10th woman from the computer tomography (CT) examination database at the radiology clinic over a period of 6 months. Women were enrolled according to the following inclusion criteria: age greater than 18 years, scanning of the minor pelvis by computer tomography and display of the sacral bone in three planes. The exclusion criteria were the following: traumatic, osteoporotic deformities of the sacral bone or distal sacral bone disorder. To determine the sacral morphometry, three measurement planes of the sacral bone were used in coronary, axial and sagittal projections. The medial, lateral, cranial and caudal diameter of the S3 foramen were measured. The most important measurement was that of the lumbosacral distance between the lumbosacral junction and the cranial point of the foramen S3. Next in importance was the distance between the midsagittal sacral plane and medial point of the foramen S3. According to the morphometric analysis, a 3D model of sacral bone was created pre-operatively and subsequently formed the planimetric basis for the creation of a sacral bone model by using a 3D printer (Figure 1). The tined lead electrode was implanted using the 3D model of sacral bone. This cross-sectional study was carried out between March and November 2016. All women included gave their informed consent as a part of standard diagnostic and therapeutic procedures. Institutional review board (IRB) approval for the study was obtained through the ethics committee at the University Hospital in Martin, Slovakia on 10 March 2016, No. 18/2016. Statistical analysis was performed using IBM SPSS 24.0 (Armonk, NY). Descriptive and analytical statistics were used. A significance level of $P < 0.05$ was used.

RESULTS

The study included 149 patients, of whom 132 (88.6%) were evaluated, and their mean age was 54.4 ± 14.3 years (range 19–77). The morphometric analysis determined the mean distance between the lumbosacral junction and the cranial part of the foramen S3 (72.1 ± 6.3 mm) and between the midsagittal sacral plane and medial point of the foramen S3 (11.8 ± 3.3 mm) (Figure 2). The differences between the right and left sites were not statistically significant. The width and height of the dorsal foramen S3 was greater than 10 mm in 54/132 cases (40.9%), 5–10 mm in 71/132 cases (53.8%) and less than 5 mm in 7/132 cases (5.3%). After creating a 3D model of sacral bone, 3D navigation was launched during electrode implantation. Of 17 tined lead electrode implants, navigation was used in 8 cases and without navigation in 9 cases. Implantation time significantly decreased from 48.1 min ± 12.2 min (non-navigation group) to 15.1 min ± 10.3 min (navigation group). Significant exposure to radiation was also reduced from 15.4 min ± 5.4 (non-navigation group) to 5.6 min ± 2.3 min (navigation group).

INTERPRETATION OF RESULTS

An important clinical goal is to shorten the implantation time, increase the neuromodulation efficiency by correct positioning of the electrode and reduce the amount of radiation exposure associated with this 3D procedure.

CONCLUDING MESSAGE

Sacral morphometry confirmed the different sizes of the foramen S3 and created a new 3D model for 3D printing. The 3D sacral bone model allows for better navigation of tined lead electrode implantation in the sacral neuromodulation of lower urinary tract dysfunction.

FIGURE 1

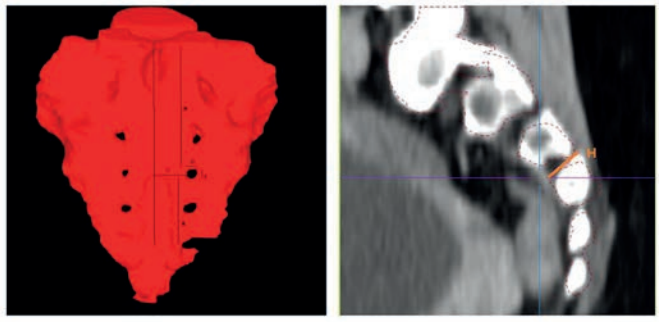

Figure 1
a) 3D model of the dorsal third sacral foramen b)Sagittal projection of the third sacral foramen

FIGURE 2

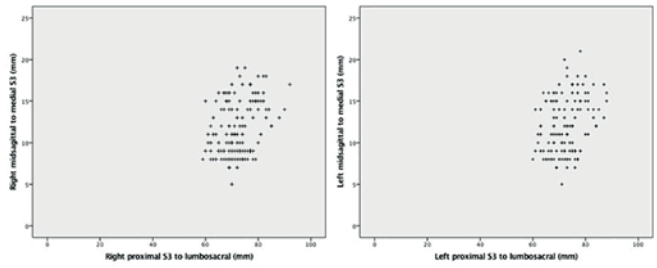

Figure 2
a) Projection of the right third sacral foramen b)Projection of the left third sacral foramen

REFERENCES

1. Female Pelvic Med Reconstr Surg 2013;19: 23-30

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** The **Ethics Committee** at the University Hospital in Martin, Slovakia **Helsinki** Yes **Informed Consent** Yes

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COUGH ASSOCIATED DETRUSOR OVERACTIVITY IN WOMEN WITH URINARY INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

This is the first study that attempts to define different forms of cough associated detrusor overactivity (CADO) with implications for the treatment of urinary incontinence (UI) in adult women. Historically, both surgery and medical management have been used to treat women with CADO without clarity in literature regarding when these are indicated [1,2].

STUDY DESIGN, MATERIALS AND METHODS

This is a retrospective review of all adult women who underwent urodynamics for UI over a 7-year period (May 2011-February 2018) at a tertiary hospital. Demographic, clinical and urodynamic findings were retrieved for all patients demonstrating CADO. The cough spike immediately preceding detrusor overactivity was defined as the index cough and was assumed to be the cough that triggered the phasic contraction. Patients were stratified into four types (Figure 1) depending on the presence or absence of urinary incontinence during different phases of CADO. Measurements were made from CADO with the lowest height of the index cough which resulted in a leak when more than one CADO was noted. ALPP was the minimum pressure at which leak was observed during the study (not necessarily the index cough).

As per departmental policy, urodynamics was offered to all women planning surgery for stress UI or mixed UI. Women with urgency UI or mixed UI received an initial trial of conservative treatment including bladder training and oral medication with urodynamics reserved for women who were refractory.

Statistical analysis was performed using R statistical program (version 3.1.3).

RESULTS

Out of 7009 studies, 1338 were for women with urinary incontinence including urgency UI (174), stress UI (290) and mixed UI (874). CADO was noted in 29 (2.2%) women including 6 with clinical urgency UI, 2 with stress UI and 21 with mixed UI (p=0.102, n.s.). 11 of these women had associated spontaneous phasic detrusor overactivity during filling. Table 1 shows the characteristics of different forms of CADO. Type I was the commonest but type III was most bothersome as measured by the Patient Perception of Bladder Condition (PPBC) scale despite similar scores on the Urogenital Distress Inventory short form (UDI 6) scale. There were differences recorded in the urodynamic pattern with a shorter latency of onset as well as shorter duration of CADO contraction in patients with type II.

INTERPRETATION OF RESULTS

The phenomenon of CADO has long been recognized but remains poorly described. The most recent ICS standardization document includes this finding for the first time but fails to give any details regarding its characteristics [3]. Careful examination of urodynamic traces clearly shows that CADO is not a single condition but a heterogeneous group with different categories of patients having findings with very different implications for management. Some patients with type II and III CADO may benefit from surgery for stress UI but such surgery is inappropriate in patients with type I and IV CADO.

CONCLUDING MESSAGE

Defining the type of cough associated detrusor overactivity (CADO) has important implications for treatment and may help improve our understanding of this condition.

FIGURE 1

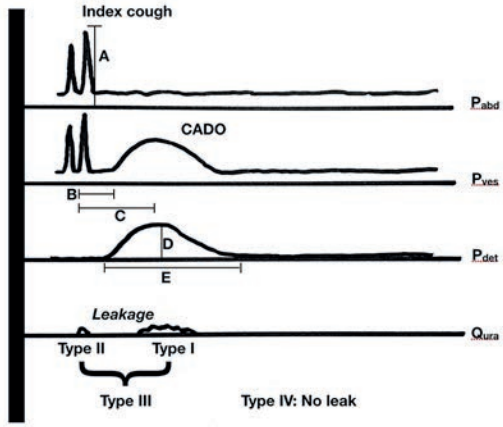

Figure 1 Types of CADO I leaks with CADO, II leaks with cough (index cough or otherwise), III leaks with both, IV leaks with neither **Urodynamic measurements** A: height of index cough B: Latency of CADO C: Time to peak CADO pressure D. Height of CADO E. Duration of CADO

FIGURE 2

Table 1. Clinical presentation and urodynamic measurements in CADO

	All CADO n=29	Type I (n=15)	Type II (n=5)	Type III (n=8)	Type IV (n=1)
Age years (IQR)	52 (14)	55 (17.5)	44 (7)	55.5 (11)	53 (0)
Diabetes mellitus	12/29	6/15	2/5	4/8	0/1
BMI	24.1 (5.9)	24.1 (4.7)	23.4 (3.7)	24.2 (6.7)	22.6 (0)
UDI 6 (IQR)	9 (3)	10 (2)	8 (0)	9 (2.5)	10 (0)
PPBC (IQR)*	4 (0)	4 (0.5)	4 (0)	5 (1)	3 (0)
Leak vol ml (IQR)	38 (48)	43 (42)	15 (20)	65.5 (43.3)	NA
Index cough height	88 (29)	88 (28.5)	83 (10)	91 (51)	89 (0)
Height of CADO	23 (12)	27 (14)	22 (6)	22.5 (12.3)	22 (0)
Latency of CADO**	2.0 (1.6)	2.8 (1.7)	0.9 (0.6)	2 (1.1)	2 (0)
Time to peak CADO	15.8 (9.1)	16 (7.3)	14.1 (9.9)	15.5 (9.6)	9.8 (0)
Duration of CADO***	32.1 (22.9)	32.8 (17.9)	18 (10.2)	39.6 (20.3)	17 (0)
ALPP (IQR)	95 (18) n=13	NA	83 (18)	95 (11)	NA

* p=0.049, ** p=0.038, *** p=0.041, Kruskal Wallis (analysis excludes type IV)

REFERENCES

1. Duecy EE, Buchsbaum GM, Flynn M. Presenting symptoms and management of cough-induced detrusor contractions. https://www.ics.org/Abstracts/Publish/44/000198.pdf. Accessed April 1, 2018.
2. Serels SR, Rackley RR, Appell RA. Surgical Treatment For Stress Urinary Incontinence Associated With Valsalva Induced Detrusor Instability. The Journal of Urology. 2000;163(3):884-887. doi:10.1016/s0022-5347(05)67827-5.
3. Rosier PF, Schaefer W, Lose G, et al. International Continence Society Good Urodynamic Practices and Terms 2016: Urodynamics, uroflowmetry, cystometry, and

pressure-flow study. Neurourology and Urodynamics. 2016;36(5):1243-1260. doi:10.1002/nau.23124.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Institutional **Ethics Committee**- Clinical Studies, Apollo Hospital, Hyderabad **Helsinki** Yes **Informed Consent** No

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BEST IN CATEGORY PRIZE "PAEDIATRICS"

TWENTY-FIVE YEARS' EXPERIENCE IN BLADDER OUTLET PROCEDURES IN CHILDREN WITH NEUROGENIC URINARY INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

The main challenging urological goals in children with neurogenic bladder dysfunction are to protect the upper urinary tract from the effect of high-pressure reflux and to achieve urinary continence. [1,2] Management should focus on ensuring bladder empting, attaining safe bladder storage pressure and capacity, and adequate sphincteric outlet resistances. [1,2] Surgical therapy could be considered when non-surgical therapy such as anticholinergic medication and intermittent catheterization fails. In the past twenty-five years our institution has built experience in bladder outlet procedures (BOPs) such as bladder neck sling (BNS) and bladder neck reconstruction (BNR). This study aimed to evaluate the long-term outcome on continence of BOPs in children with urinary incontinence secondary to neurogenic sphincteric incompetence.

STUDY DESIGN, MATERIALS AND METHODS

We retrospectively reviewed all children who underwent a BOP between 1992 and 2017 in our institution. The principles of Helsinki Declaration were followed in lieu of formal ethics committee approval. A BOP was combined with bladder augmentation if a low compliant bladder and/or a small capacity insufficiently responsive to anticholinergics was seen. Often the BOP was combined with the creation of a continent urinary conduit, most commonly an appendicovesicostomy. We divided the BOPs in two types: BNR and BNS. A BNR was performed using one of the three techniques described by Mitchell, Pippi Salle or Young-Dees. The choice of technique depended on the preference of the surgeon. We chose to merge the results of those techniques, because they all increase the bladder outlet resistance by lengthening and narrowing the urethra with tubularization of the trigone. The BNS procedure was based on co-aptation, elevation and narrowing the urethra by suspension of the bladder neck with an autologous fascial strip to the pubic symphysis. Continence at the end of follow up was the primary endpoint, defined as 'dry' when there was an interval of a minimum of 4 hours without urinary leakage. Secondary outcomes were continence within 1 year postoperative, and reinterventions. Non-parametric tests were used for statistical analysis (significance $p<0.05$).

RESULTS

A total of 60 children underwent a BOP, at a median age of 11.6 (IQR 7.8-13.9) years. The etiologies of neurogenic urinary incontinence were myelomeningocele, VACTERL-associated cause, and sacrococcygeal teratoma. Forty-three (71.7%) patients underwent a BNS and in 17 (28.3%) a BNR. In Table 1 the patient characteristics are shown. Dry rate within one year was 38.3%. After a median follow up of 10.4 (IQR 6.5-15.5) years, 76.7% of all children were dry. Twenty-five children (41.7%) needed reintervention(s) after a median follow-up of 1.0 (IQR 0.7-3.5) years, including redo of the BOP, other type of outlet procedure, bulking agents, bladder augmentation and bladder neck closure (Figure 1).

INTERPRETATION OF RESULTS

Although techniques and insights have changed over the years, achieving continence in children with neurogenic sphincteric incompetence is still a challenge. The choice of a BOP with or without concomitant surgery such as bladder augmentation and continent urinary conduit is influenced by the patient's needs, gender, bladder function, and the surgeon's preference. Because it concerns a young patient population, awareness of the outcome on the long term is important, but unfortunately reports are sparse. Those long-term results are valuable for patient counseling and to create awareness in patients and parents about what to expect. Future studies should use a clear definition of urinary incontinence and add validated patient-reported outcome measurements to evaluate the effect on symptoms and quality of life.

CONCLUDING MESSAGE

BOPs resulted in moderate to good continence rates on the long-term in children with neurogenic urinary incontinence, although the need of a reintervention was not unlikely. Reporting long-term results is essential and helpful for patient counseling.

FIGURE 1

	Total, n=60	BNS, n=43	BNR, n=17	
Gender				
- Female	35 (58.3%)	31 (72.1%)	4 (23.5%)	
- Male	25 (41.7%)	12 (27.9%)	13 (76.5%)	p<0.001[a]
Median age at operation, yrs (IQR)	11.6 (7.8-13.9)	11.8 (8.5-14.1)	10.4 (7.6-12.5)	p=0.279[b]
Median follow up, yrs (IQR)	10.4 (6.5-15.5)	11.2 (7.5-18.2)	8.9 (6.1-15.1)	p=0.305[b]
Etiology				
- Myelomeningocele	55 (91.7%)	41 (95.4%)	14 (82.4%)	
- VACTERL association	4 (6.7%)	1 (2.3%)	3 (17.6%)	
- Sacrococcygeal teratoma	1 (1.7%)	1 (2.3%)	-	p=0.086[a]
Concomitant surgery:				
- Continent conduit	58 (96.7%)	41 (95.3%)	17 (100%)	p=0.366[a]
- Bladder augmentation	48 (80.0%)	33 (76.7%)	15 (88.2%)	p=0.316[a]
- Ureteral reimplantation	5 (8.3%)	3 (7.0%)	2 (11.8%)	p=0.545[a]

Table 1. Characteristic presented as number (%) or median (interquartile range). Bladder neck sling (BNS); bladder neck reconstruction (BNR).
[a] Chi-squared test, [b] The Mann-Whitney U test

FIGURE 2

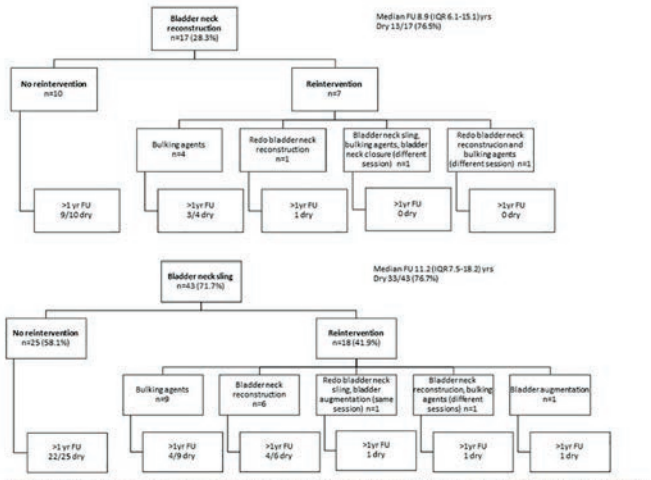

Figure 1. Results on continence outcome after >1 year of follow up (FU) with or without reintervention.

REFERENCES

1. Guys JM, Hery G, Haddad M, Borrionne C. Neurogenic bladder in children: basic principles, new therapeutic trends. Scand J Surg. 2011;100(4):256-263.
2. Fernandes ET, Reinberg Y, Vernier R, Gonzalez R. Neurogenic bladder dysfunction in children: review of pathophysiology and current management. J Pediatr. 1994;124(1):1-7.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Retrospective study, data were collected from patients' medical charts. The principles of **Helsinki** Declaration were followed in lieu of formal ethics committee approval. **Helsinki** Yes **Informed Consent** No

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CHILDHOOD ENURESIS – A MAJOR PREDICTOR FOR PELVIC FLOOR DISORDERS IN ADULTHOOD

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HYPOTHESIS / AIMS OF STUDY

To survey the adult prevalence of urinary (UI) and fecal (FI) incontinence and symptomatic pelvic organ prolapse (sPOP) in a large cohort of nulliparous women, with or without a history of childhood nocturnal enuresis (NE).

STUDY DESIGN, MATERIALS AND METHODS

A national questionnaire survey was conducted in 2014. The study population was identified by the Central Bureau of Statistics from the Total Population Register and comprised Swedish women that had not given birth and were 25-64 years of age. Twenty thousand women were randomly invited to participate in this study from the total number of eligible nullipara (n = 625 810). The 20 000 participants comprised four, independent, random samples, stratified by decades of age, with oversampling of the two youngest age groups for a subsequent longitudinal follow-up. The women were invited to answer a 40-item self administered questionnaire (web and postal version) which included questions about urinary or fecal incontinence, genital prolapse, childhood nocturnal enuresis, severity and subjective impact of disorders, treatment, etc. Childhood NE was defined according to the International Childrens Incontinence Society (ICCS). Multivariable logistic regression models were used.

RESULTS

The response rate was 52.2%, lowest (44.7%) in the youngest age group (25-34 years) increasing consistently to 62.4% among the oldest (55-64 years). One or more PFDs occurred in 26.7% (95% CI 25.8-27.7) of NE-negative women and increased to 43.4% (40.3-46.5) in NE-positive women. Correspondingly UI increased from 13.7% (CI 13.0-14.5) to 28.9% (CI 26.1-31.8). The subtypes of UI i.e. urge urinary incontience (UUI) and stress urinary incontinence (SUI) were doubled for UUI from 2.4% (CI 2.1-2.8) to 5.7% (CI4.4-7.3) and for SUI from 5.7%(CI 5.2-6.2) to 10.5% (CI 8.8-12.6) in women without a history of childhood NE compared to women with a history of NE. Mixed urinary incontinence (MUI), the most bothersome subtype of UI, more than doubled from 3.3% (CI 2.9-3.7) in NE-negative women to 8.3% (CI 6.8-10.2) in those with a history of childhood NE. FI and sPOP also nearly doubled in the NE-positive women in comparison to NE-negative women. The effect of BMI was substantial. UI increased nearly more than 5 fold from 11,2% in NE-negative group with normal BMI <25 to 55,7% in NE-positive group with high BMI >35.

INTERPRETATION OF RESULTS

A history of childhood NE was associated with a doubling of the prevalence of all pelvic floor disorers (PFDs) compared with nullipara without NE. One or more PFDs occurred in 26.7% of NE-negative women but increased to 43.4% for NE-positive women.

CONCLUDING MESSAGE

Childhood NE is a risk factor for several different types of pelvic floor dysfunction. Earlier studies have reported that childhood NE is a risk factor for UI but this study has demonstrated that childhood NE is also a risk factor for genital prolapse and fecal incontinence In addition childhood NE was shown to be a risk factor for all three subtypes of UI. Childhood enuresis should therefore be taken into account in the construction of antenatal prediction models for birth-related late PFDs.

FIGURE 1

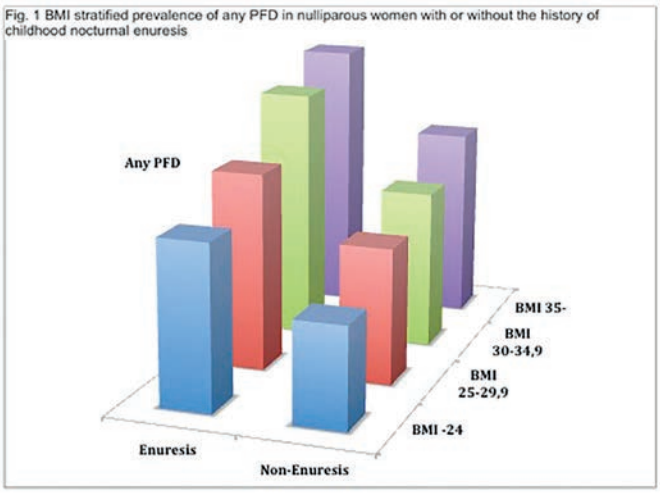

FIGURE 2

	Enuresis	Non-enuresis	Difference
	mean % (95% CI)	mean % (95% CI)	odds ratio (95%CI)
UI	28.9 (26.1-31.8)	13.7 (13.0-14.5)	2.55 (2.19-2.98)
UUI	5.7 (4.4-7.3)	2.4 (2.1-2.8)	2.42 (1.78-3.28)
SUI	10.5 (8.8-12.6)	5.7 (5.2-6.2)	1.96 (1.57-2.45)
MUI	8.3 (6.8-10.2)	3.3 (2.9-3.7)	2.71 (2.12-3.46)
sPOP	11.2 (9.4-13.2)	7.5 (7.0-8.1)	1.55 (1.25-1.91)
FI	17.3 (15.1-19.8)	10.6 (9.9-11.3)	1.77 (1.48-2.12)
Any PFD	43.4 (40.2-46.5	26.7 (25.8-27.7)	2.10 (1.83-2.41)

*adjusted for age and BMI (m^2/kg)

Funding ALF **Funding** Sweden **Clinical Trial** No **Subjects** Human **Ethics Committee** Regional Ethics committee in Gothenburg (EPN) **Helsinki** Yes **Informed Consent** Yes

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ULTRASONIC FEATURES OF NEUROGENIC BLADDER IN CHILDREN

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HYPOTHESIS / AIMS OF STUDY

To investigate the sonographic features of neurogenic bladder in children and improve the value of ultrasound in diagnosis.

STUDY DESIGN, MATERIALS AND METHODS

From June 2015 to January 2018 in our hospital, 29 children with neurogenic urinary bladder disease were selected. There were 13 males and 16 females, aged 1 to 15 years, with an average age of (6.1±2.72) years. In the past history, there were 12 cases of meningocele, 6 cases of tethered cords, 6 cases of intraspinal tumors, 3 cases of recessive spina bifida, 2 cases of scoliosis and vertebral spondylolisthesis. Clinical manifestations of urinary incontinence in 20 cases, 9 cases of urinary retention.

Instruments and methods

The instrument uses the GE VOLUSON E8 and the MINDRAY DC-8 Color Doppler Ultrasound System. It uses a convex array probe (frequency of 6-8 MHz) and a high-frequency linear array probe (frequency of 8-12 MHz) for joint scanning.

Under the age of 3, crying uncooperative children orally 10% chloral hydrate 0.5ml/kg body mass sedation, parents accompanying with the whole process. Subjects exposed the abdomen in supine position and scanned the bladder at the upper edge of the pubic symphysis. The oblique oblique coronal section, transverse section and longitudinal section of the bladder were observed to observe the bladder wall. The transverse section and oblique section were used to show the posterior lower edge of the bladder to observe whether the ureter was dilated. Observing the expansion of the ureteral orifice in the trigone of the urinary bladder. If the internal diameter of the ureter can be displayed, the internal diameter of the ureter can be recorded. Scan along the dissection of the dilating ureter to record the maximum internal diameter.

The degree of dilation was recorded. The bilateral kidneys were scanned. The long and short axes of the kidneys were recorded and the long diameter and the right and left diameters of the kidneys were recorded. If the renal pelvis was dilated, the anteroposterior diameter of the renal pelvis was recorded, and the presence of water in the kidney was observed. Scar formation. Finally, take a stone and use a high-frequency probe (5 MHz or more) to observe the posterior urethra and its surroundings via the perineum. All patients underwent excretion urography after ultrasound examination to see if there was vesicoureteral reflux.

Statistical method

SPSS 13.0 software was used for statistical analysis and data analysis. The count data were analyzed by two separate two-group chi-square tests. The measurement data were analyzed by two independent samples t test. $p<0.05$ was considered statistically significant.

RESULTS

29 patients had 58 kidneys and 58 ureters.

1. Abnormal bladder image: A total of 26 cases (26/29, 89.6%), of which 23 cases showed trabecular and false diverticulum formation in the bladder wall, 3 cases showed thickening of the wall, less smooth, the other 3 cases No positive findings (3/29, 10.4%);

2. Ureteral vesicoureteral reflux: 9 cases (7 cases bilaterally, 2 cases unilaterally) with 16 ureteral distal end and uretero-

cyst entrance increased, the detection rate was 31%, and the opening diameter was (0.47±0.30) cm;

3.4 cases (3 cases bilaterally and 1 case unilaterally) had a total of 4 kidneys with scar contracture. The incidence of kidney shrinked compared with that of healthy kidneys. The incidence was 15%. All patients were confirmed to have reflux by urinary tract angiography. Ultrasound diagnosis of vesicoureteral reflux through the distal end of the ureter and the opening of the bladder has a high specificity, but it is less sensitive to children with mild primary ureteral reflux.

INTERPRETATION OF RESULTS

1. The average age of patients in this group was 6.1 years old. Due to the increased bladder filling pressure and defibrillation fibrosis, 80% (23 cases) of children had cystic changes in the bladder wall and false diverticulosis bladder fibrosis at the time of presentation. Ultrasound diagnosis can be combined with medical history at this time, after the exclusion of mechanical lower urinary tract obstruction, neurogenic bladder can be highly suspected.

2. The results of this study suggest that: Ultrasound shows that the distal end of the ureter and the entrance of the ureterocyst to expand, showing a hole-shaped, and with the ureter can change the size of the peristalsis, the above imaging characteristics of the diagnosis of vesicoureteral reflux, high specificity, consider and Detrusor muscle fibrosis and loss of elasticity are not related to the adequate supporting effect of the ureteral wall embedded in the bladder. This method is simple in diagnosing reflux and has limited conditions, but it has a low sensitivity for the diagnosis of mild vesicoureteral reflux. It is difficult to show that it is difficult to show slight expansion of the ureter, the children do not cry, and the condition of the bladder wall is complicated with the existing ultrasound technology. It is related to the difficulty of identifying openings.

3. Due to the increase of intravesical pressure, the drainage of the upper urinary tract is not smooth and the vesicoureteral reflux promotes recurrent infection of the renal parenchyma. Fibrous tissue hyperplasia leads to the contraction of the renal scar. Ultrasonography can show that the surface of the kidney is confined and the kidney is smaller than the kidney. Ultrasound in this group found 4 cases of children with kidney shrinkage, all diagnosed by urinary tract angiography there is reflux.

CONCLUDING MESSAGE

Fully understanding the specific performance of ultrasound and improving the complementary effects with other examinations will help improve the reliability of the assessment of the progress of the disease.

FIGURE 1

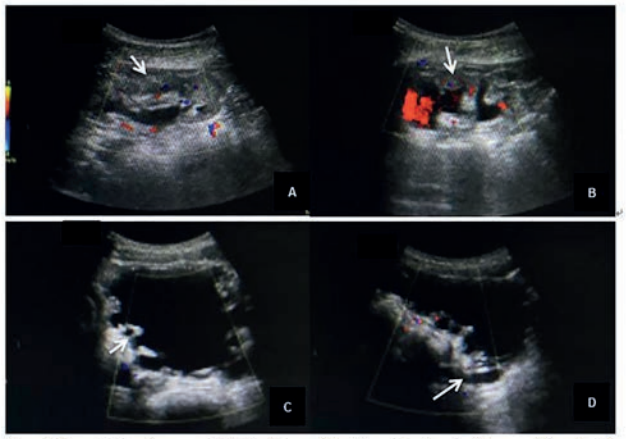

Figure 1 Characteristics of neurogenic bladder ultrasound in children: Case 1, male, 10 years and 6 months, 10 years after surgical treatment of lumbosacral spinal meningocele, and 7 days of urinary tract infection. A and B: Longitudinal view of the kidneys showing moderately accumulated left kidney and right kidney (GRIGNON grade 2-3), dilation of the renal pelvis and renal pelvis, increased echogenicity of the renal parenchyma, poor uniformity (arrowheads), demarcation of the cortex and medulla Clear, suggesting scar formation after repeated renal urinary tract infections in the kidneys; C: Bladder cross-sectional view showing irregular thickening of the bladder wall, less smooth, showing trabecular echoes (arrows); D: bladder longitudinal view showing small bladder wall Beam formation, irregular expansion of the ureter (arrow). In this case, the ultrasound showed an enlargement of the upper urinary tract, thickening of the bladder wall, trabecular lesions, ureteral dilatation, abnormal parenchymatous sound of the two kidneys, and hydronephrosis, combined with a history of spinal cord lesions, consistent with important signs of neurogenic bladder.

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ACTIVATION OF SEROTONIN 5-HT2C AND 5-HT7 RECEPTORS ENHANCES THE URETHRAL CLOSURE REFLEX DURING SNEEZING IN RATS

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HYPOTHESIS / AIMS OF STUDY

The spinal serotonergic pathways have been reported to be involved in the control of urethral continence reflexes. Previous study demonstrated that serotonin (5-HT) receptor subtypes, 5-HT1A or 5-HT2C, respectively, reduce or enhance the urethral continence reflex during sneezing in rats [1]. However, because there are other multiple excitatory and inhibitory 5-HT receptor subtypes, the overall effects of the 5-HT system or the subtype-specific mechanism in the control of the urethral function remain to be elucidated. Moreover, 5-HT7 receptors are shown to be expressed in the spinal cord and dorsal root ganglia of rats [2] although the role of 5-HT7 receptors in the urethral continence reflex is not well elucidated. Therefore, in this study, we examined the impacts of 5-HT depletion induced by p-chlorophenylalanine (PCPA) and the effects of activation of 5-HT receptor subtypes such

as 5-HT2C and 5-HT7 on urethral baseline activity and reflex contractions during sneezing in PCPA-pretreated rats.

STUDY DESIGN, MATERIALS AND METHODS

Sixty adult female Sprague-Dawley rats weighing 228–270 g were used. We measured the amplitude of urethral pressure responses during sneezing (A-URS) and urethral baseline pressure (UBP) using a microtransducer-tipped catheter for 32 rats. We measured sneeze-induced leak point pressure (S-LPP), the lowest pressure value that induced fluid leakage from the urethral orifice for 28 rats. Pre-drug sneeze-induced responses were measured before intravenous application of a 5-HT2C agonist (CP-809101), a 5-HT2C antagonist (SB-242084), a 5-HT1A antagonist (WAY-100635), a 5-HT7 agonist (LP44), and a 5-HT7 antagonist (SB-269970) in PCPA-pretreated rats. WAY-100635 was administered before LP44 administration to suppress the partial 5-HT1A effect of LP44. Data are expressed as mean ± standard error (SE). Unpaired t-test was used to compare the A-URS, UBP and Pabd between normal and PCPA-pretreated rats. Paired t-test was also used to compare the values before and after CP-809101 administration. One-way analysis of variance followed by Bonferroni's multiple comparison tests were used to compare before and after administrations of multiple drugs. Statistical significance was set at P values < 0.05.

RESULTS

1) A-URS and UBP

Two-day pre-treatment of PCPA (n = 5) significantly decreased A-URS from 71.8 ± 7.1 to 36.8 ± 4.3 cmH2O (P < 0.01), and UBP from 31.1 ± 3.0 to 17.8 ± 2.2 cmH2O (P < 0.01) compared to normal rats (n = 6). In PCPA-pretreated rats, CP-809101 (n = 4) or LP44 with pre-administration of WAY-100635 (5-HT1A antagonist) (n = 7) significantly increased A-URS from 42.1 ± 5.7 to 66.2 ± 6.5 cmH2O (P < 0.01) and 30.0 ± 2.7 to 50.5 ± 5.3 cmH2O (P < 0.01) and UBP from 17.3 ± 1.2 to 32.4 ± 2.7 cmH2O (P < 0.05) and 15.2 ± 1.6 to 26.6 ± 2.1 cmH2O (P < 0.01), respectively (Figure 1). The effects of CP-809101 and LP44 were antagonized by antagonists of each receptor subtype (SB-242084; n-=4 and SB-269970; n=6, respectively). The average values of sneeze-induced increases in Pabd measured by intra-abdominal catheters were not significantly different between normal and PCPA-pretreated rats or after injection of any drugs.

2) S-LPP

Although SUI was not observed even at the highest intravesical pressure during sneezing of 108.8 ± 5.6 cmH2O in normal rats (n = 6), fluid leakage from the urethra during sneezing was observed with S-LPP values of 40.1 ± 2.5 cmH2O in all PCPA-pretreated rats (n = 6). In these 5-HT-depleted rats, fluid leakage from the urethra was still observed during sneezing after the treatment with CP-809101(n =4) or LP44 (n =6), which, however, significantly increased S-LPP by 28.0 cmH2O; from 39.7 ± 4.5 cmH2O to 67.7 ± 3.1 cmH2O (P < 0.01), and 15.2 cmH2O; from 37.8 ± 1.4 cmH2O to 53.0 ± 3.4 cmH2O (P < 0.01), respectively, compared to rats treated with PCPA alone. The effects of CP-809101 and LP44 were blocked by antagonists of each receptor subtype (n =3 each) (Figure 2).

INTERPRETATION OF RESULTS

In present study, we first examined the effect of PCPA because systemic pre-treatment of PCPA for 2 days reportedly resulted in 95 % depletion in brain 5-HT content [3]. Using this method, we clarified that PCPA treatment caused SUI during sneezing, indicating that the overall 5-HT system acts to maintain urinary continence. Furthermore, we examined the effects of 5-HT subtype-selective drugs (5-HT2C and 5-HT7) on urethral baseline activity and reflex contractions during sneezing in rats.

CONCLUDING MESSAGE

The results of this study indicate that activation of 5-HT receptors, as a whole, enhances the active urethral closure reflex during sneezing and that 5-HT2C and 5-HT7 receptors have facilitatory roles in urethral continence mechanisms in rats.

FIGURE 1

Figure 1; Effects of CP-809101 (5-HT2C agonist) (A) and LP44 (5-HT7 agonist) with WAY-100635 (B) on A-URS, UBP and Pabd in PCPA-pretreated rats.

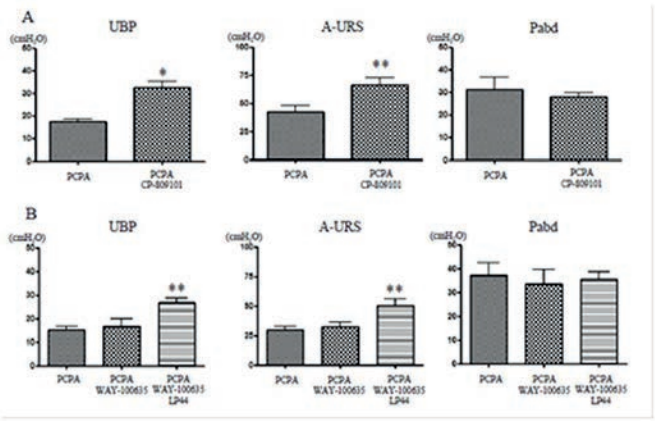
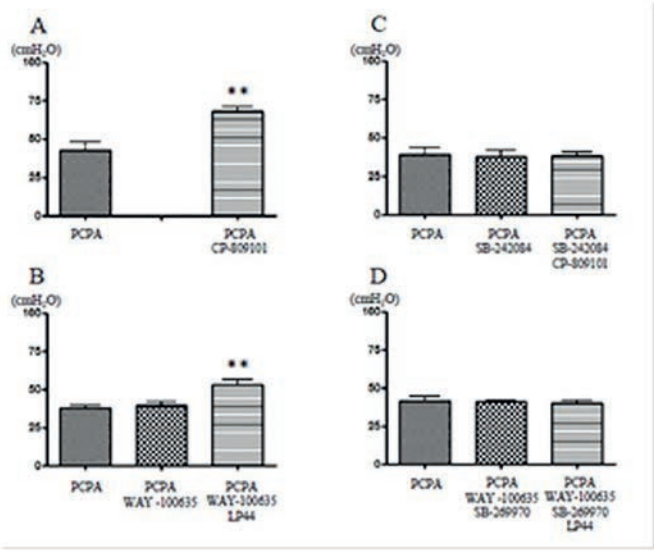


FIGURE 2

Figure 2; Effects of CP-809101 (5-HT2C agonist) (A), LP44 (5-HT7 agonist) with WAY-100635 (B), CP-809101 with pre-treatment of SB-242084 (5-HT2C antagonist) (C) and LP44 and WAY-100635 with pre-treatment of SB-269970 (5-HT7 antagonist) (D) on S-LPP in PCPA-pretreated rats.



REFERENCES

1. Miyazato M, Kaiho Y, Kamo I, Kitta T, Chancellor MB, Sugaya K, Arai Y, de Groat WC, Yoshimura N. Role of spinal serotonergic pathways in sneeze-induced urethral continence reflex in rats. Am J Physiol Renal Physiol 297: F1024–F1031, 2009.
2. Doly S, Fischer J, Brisorgueil MJ, Vergé D, Conrath M. Pre- and postsynaptic localization of the 5-HT7 receptor in rat dorsal spinal cord: immunocytochemical evidence. J Comp Neurol 26: 256-69, 2005.
3. Yoshimura M, Hagimoto M, Matsuura T, Ohkubo J, Ohno M, Maruyama T, Ishikura T, Hashimoto H, Kakuma T, Yoshimatsu H, Terawaki K, Uezono Y, Toyohira Y, Yanagihara N, Ueta Y. Effects of food deprivation on the hypothalamic feeding-regulating peptides gene expressions in serotonin depleted rats. J Physiol Sci 64: 97–104, 2014.

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FEASIBILITY OF SHEEP ANIMAL MODEL FOR MIDURETHRAL SLING SURGERIES

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HYPOTHESIS / AIMS OF STUDY

Stress urinary incontinence (SUI) is a fairly common medical problem affecting about 40% of women. The current treatment strategies include conservative and surgical options. Midurethral slings are the gold standard surgical option with a cure rate of 80-90% [1]. Despite the sling procedure offers high efficacy, mesh and biomaterial related drawbacks are not uncommon. Novel biological biomaterials might help especially after failed/complicated synthetic mesh surgeries. To test the novel biomaterials, rats and rabbits were effectively utilized for biocompatibility. However, the slings were undersized to fit in the small animals' anatomical spaces, which might not reflect the properties of human-sized slings and devices. Sheep cadavers were carried out in literature for hands-on training of sling techniques. Our aim was to create a reliable larger animal model of human-sized transvaginal sling placement. We are the first to report survival surgery for transvaginal slings in sheep animal model.

STUDY DESIGN, MATERIALS AND METHODS

We used eight Dorset retired breeder, female ewes (160-175 pounds). Under general anesthesia, ewes have been positioned on their backs (dorsal recumbency) to mimic lithotomy position. After skin and vaginal surgical preparations, relevant vaginal and abdominal dimensions were reported (Figure 2). We did measure clitoral dimensions, labia majora length, vaginal length, perineum length, the width of the vagina when opened using self-retaining retractors and stays and length of symphysis pubis (Figure 2). A disposable tape measure was used for all measurements for making the comparison.

We used human-sized slings and trocars for implantation (e.g. Lynx™ Suprapubic Mid-Urethral Sling System, Boston Scientific, MA, USA). Using the sterile instruments, surgery was mimicking human TVT procedure. Sterile Foley's 12F urethral catheter was inserted (Figure 1a). We did a 3 cm incision in the anterior vaginal wall, 1 cm below the urethral meatus. Dissection was done bilaterally to reach out to the endopelvic fascia. Two suprapubic 1 cm-size skin incisions 5 cm-apart and located 7 cm above the pubic symphysis of

the animal. The trocars traveled through the suprapubic incisions on each side in a downward motion with surgeon's forefinger acting as a guide (from the vagina) during insertion from the suprapubic region to the vagina (Figure 1d). The trocars passed through each incision, through the retropubic space, hugging the posterior aspect of the symphysis pubis, then perforating the endopelvic fascia and exiting through the already made vaginal incision. Cystoscopy was done to ensure that bladder and urethra are not injured (figure 1b and 1c). Ewes urethra accommodated up to 16Fr. cystoscopy sheath. The sling was hooked to the trocars. The trocars on both sides were pulled to the suprapubic skin incision, placing the sling under the urethra without tension (figure 1e). Closure of vaginal incisions was done using 2-0 absorbable sutures (figure 1f). Animals' intraoperative and postoperative follow up charts were recorded.

RESULTS

The sheep vaginal anatomy was feasible to perform the placement of human-sized sling devices and surgical instruments. However, average vaginal dimensions were less than human. Mean vaginal length of sheep was 8.4 cm (figure 2b) compared to the reported 9.6 cm in human [2]. All average measurements are shown in figure 2d. The mean symphysis pubis' length was 6.7 cm which is longer than reported human symphysis pubis (from 2.6 to 4.6 cm [3]). We had to make higher abdominal incisions (6 cm above the pubic bone) to accommodate the trocar curvature with the lengthy symphysis pubis without injuring the internal abdominal organs. Mean operative time was 44 ±12 minutes. Blood loss was less than 50 cc. All ewes survived the surgery and recovered smoothly. All animals urinated normally without haematuria or obstruction since the first postoperative day. After two weeks, Incisions were healed without signs of erosions, infection or rejection.

INTERPRETATION OF RESULTS

We are the first to report vaginal sling survival surgery in the sheep model. The sheep vaginal dimensions are suitable for vaginal surgery experiments. Spontaneous prolapse has been reported in elder ewes suggesting the similarity of both physiological mechanisms and anatomical support of the pelvic floor in human and sheep. The novel biomaterials had been tested in small sizes suitable for the proof of biocompatibility. Mechanical testing of the small-sized biomaterials might not reflect the same properties when translated to human-sized slings. Suburethral implantation of slings into female sheep model might be ideal for translation of the biomaterial slings before clinical trials. Our focus of future research will be to induce incontinence in the sheep model.

CONCLUDING MESSAGE

We were able to implant human-sized slings into female ewes using the human instruments and devices. The vaginal anatomy of the female sheep might suggest a reliable model for pre-clinical testing of novel biomaterials and sling devices.

FIGURE 1

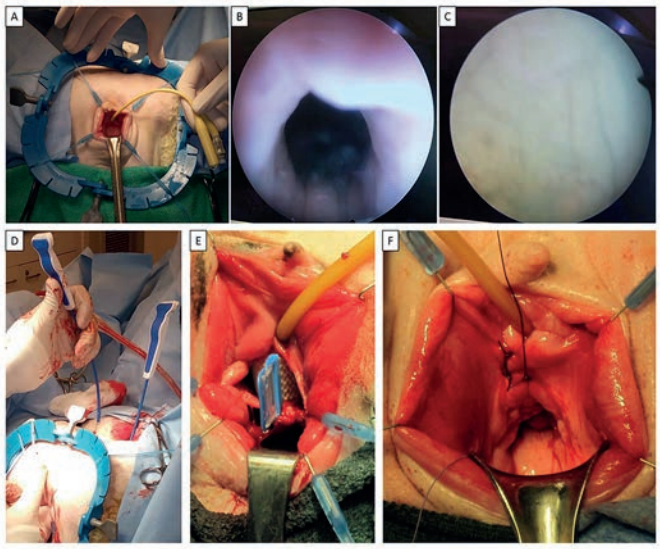
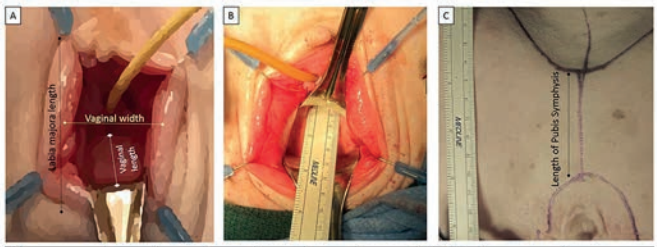


Figure 1. A. Show the positioning of sheep before surgery and the allocation of human sized self retaining retractor and stays. B. Shows cystoscopy image of the urethra. C. Shows cystoscopy image of the bladder. D. Shows the introduction of the human-sized trocars. E. The human-sized sling placed under urethra before deployment. F. Closure of the vaginal incision.

FIGURE 2



D	Clitoral length	Clitoral width	Clitoris to urethra	Labia Majora length	Perineum length	Vaginal length	Maximum vaginal width with retraction	Length of Symphysis pubis	Distance from pubic bone to incision
Sheep (in cm)	1.5±0.37	0.4±0.13	2.45±0.42	7.25±1.20	1.125±0.26	8.4375±1.99	7±0.80	6.775±0.55	6.2875±0.70
Human (in cm) [2, 3]	1.9±0.87 [2]	0.55±0.17 [2]	2.85±0.71 [2]	9.3±1.3 [2]	3.13±0.85 [2]	9.6±1.5 [2]		2.6 to 4.6 cm [3]	

Figure 2. Measurements of vaginal abdominal relevant dimensions. A. Presenting a schematic explanation of the dimensions measured of the sheep vagina. B. Shows measurement of vaginal length of the sheep. C. Pubic bone length of the sheep. D. Table showing the mean dimensions measured in our ewes versus the reported dimensions in human.

REFERENCES

1. Karim, N.B., et al., Review on midurethral sling procedures for stress urinary incontinence. Gynecology and Minimally Invasive Therapy, 2015. 4(2): p. 33-36.
2. Lloyd, J., et al., Female genital appearance: "normality" unfolds. Bjog, 2005. 112(5): p. 643-6.
3. Becker, I., S.J. Woodley, and M.D. Stringer, The adult human pubic symphysis: a systematic review. J Anat, 2010. 217(5): p. 475-87.

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TIME COURSE OF BEHAVIOR AND PHYSIOLOGY OF URINARY CONTINENCE RECOVERY AFTER VAGINAL DISTENSION IN RATS

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HYPOTHESIS / AIMS OF STUDY

Prolonged childbirth is a risk factor for urinary incontinence whose mechanisms are not well established. In rats, the vaginal distension (VD) model, which mimics prolonged childbirth, stretches the pelvic nerves, abolishes external urethral sphincter (EUS) [1] activity and induces urine leakage, a behavioral sign of stress urinary incontinence [2]. The present study aimed to determine in rats after VD if the electromyographic (EMG) activity of the EUS and behavioral urinary continence recover simultaneously.

STUDY DESIGN, MATERIALS AND METHODS

The experimental protocol was approved by the university committee on Laboratory Animals and performed in accordance with the guidelines of the Mexican Council on Laboratory Animals Care (NOM-062-Z00-1999), and the Guide for the Care and Use of Laboratory Animals (National Research Council of the National Academies, USA). We employed adult nulliparous Wistar female rats (250–300 g). The animals were randomized to undergo 4 h of VD or sham VD (SH). In VD animals, to simulate the difficulty of the fetus passing through the pelvic cavity and the injury induced by a prolonged second stage of human childbirth, a modified 10 Fr. Foley balloon catheter was inserted into the vagina and filled with 4 ml water for a period of 4 h. In SH animals the catheter was placed into the vagina for 4 h but was not inflated. Rats were divided into two experiments. In experiment 1, micturition behavior was recorded for 6 h, before and 3 to 13 days after VD (SH, n=5; VD, n=8) employing a closed-circuit video system that includes infrared cameras and digital video recording. Animals were placed in a wire floor cage and voided volume was collected in a plastic container. The ventral abdominal area of the animals was videotaped to determine urine loss during spontaneous rat behaviors. Stereotyped female micturition behavior occurred when rats walked to the edges of the cage, placed the rump toward the wall, and expelled urine, flowing in a stream [2]. In this case urine was found in the four edges but mainly in the corners. Leakage was considered as any small volume of urine expelled (~0.02 ml) without the stereotyped female behavior of micturition, and the number of drops were analyzed.

In experiment 2, EUS EMGs were recorded immediately and 3-12 days after VD (VD, n=5 per day; SH, n=8) employing an electrophysiological recording system. EUS EMG responses were induced by mechanical stimulation of the clitoral sheath (pudendo-pudendal reflex) or the bladder (bladder-EUS reflex). During both stimulations, amplitude (μV) and frequency (Hz) of a 1-second sample at the middle of the EUS EMGs was analyzed.

RESULTS

SH rats showed the stereotyped female behavior of micturition and did not drip urine in any body posture throughout the study. In contrast, 100% of VD rats dripped urine in the absence of the stereotyped voiding behavior at day 3 (38 ± 7 drops) and 5 (39 ± 8 drops) after VD. The leakage was associated with behaviors implicating stress, such as standing to reach food, sneezing, scratching and vertical exploration. At day 7 (28 ± 5 drops) and 9 (13 ± 2 drops) after VD, the dripping disappeared in 70% of animals and at day 13 in 100%. In SH animals, EUS EMG activity during the pudendo-pudendal reflex was 87.4 ± 11 μV and 344 ± 50 Hz, and during bladder-EUS reflex was 52.2 ± 6 μV and 255 ± 25 Hz. In the VD group, EUS EMG activity was abolished immediately until day 5 after VD. At day 6, EMG activity during the pudendo-pudendal reflex was recovered in 26% (14.5 ± 5 μV) and 16% during the bladder-EUS reflex (14.3 ± 7 μV) with respect to EUS EMG amplitude of SH animals. At day 7 and 9 after VD the amplitude of EUS EMG activity was recovered to 40-60% and 30-35% during the pudendo-pudendal and bladder-EUS reflexes, respectively. At day 10-12 both reflexes were recovered to 100%.

INTERPRETATION OF RESULTS

The stereotyped behavior of micturition of female rats suggests that they feel bladder fullness and volition to expel urine, then move to the edges of the cage. Therefore, any urine expelled without the stereotyped behavior of micturition was considered as a sign of urinary incontinence. The fact that VD completely abolished the EUS EMG activity at the first 5 days after VD, which correlates with the maximum expression of stress urinary incontinence (leakage associated with stress behaviors), corroborate that EUS tonic contraction contributes to maintain urinary continence [3]. EUS inactivity can be induced during VD by injury of the EUS muscle, its nerve or neuromuscular junctions. Given that urine leakage did not occur all the time, we assume that rats can maintain certain degree of urinary continence after VD, suggesting that the other components of urinary continence are not severely affected by VD, particularly urethral smooth muscle and epithelial cells and their innervation from the major pelvic ganglia [2]. EUS activity gradually recovered after VD and required about 10-12 days to restore to the values of SH animals suggesting that this time period is the window for regenerative processes of the injured structures after VD. Given that EUS activity recovery precedes recovery of behavioral expression of urinary continence, suggests that EUS activity is necessary to correct urinary continence in rats after VD.

CONCLUDING MESSAGE

Urinary continence recovery after VD in conscious rats is preceded by EUS neuromuscular circuitry recovery.

REFERENCES

1. Jiang, H.H., et al., Electrophysiological function during voiding after simulated childbirth injuries. Experimental Neurology, 2009. 215(2): p. 342-348.
2. Palacios, J.L., et al., Neuroanatomic and behavioral correlates of urinary dysfunction induced by vaginal distension in rats. American Journal of Physiology-Renal Physiology, 2016. 310(10): p. F1065-F1073.
3. Jiang, H.H., L.B. Salcedo, and M.S. Damaser, Quantification of neurological and other contributors to continence in female rats. Brain Research, 2011. 1382: p. 198-205.

Funding CONACYT: YCG 183446, JLPG 488223 **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** Centro Tlaxcala de Biología de la Conducta bioethical committee

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ELECTRICAL STIMULATION OF THE PUDENDAL NERVE FOR NEUROREGENERATION IN A RAT MODEL OF STRESS INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

Stress Urinary Incontinence(SUI) is the leakage of urine due to an increase in abdominal pressure, which overcomes urethral resistance. It affects 30% of women over the age of 40. During vaginal delivery, when the child's head passes through the birth canal, the pudendal nerve(PN) can be injured, as can the muscle it innervates, the external urethral sphincter(EUS). Women with postpartum SUI have been shown to have increased PN motor latency compared to continent women, indicating nerve function is important to maintaining continence, and suggesting that complete nerve regeneration after childbirth is also important[1]. Since post-partum SUI has a strong correlation to later development of SUI, a treatment that enhances nerve regeneration for postpartum incontinence could alleviate SUI symptoms and prevent later development of SUI[2]. However, no treatments are currently available to enhance nerve regeneration.

A rat dual nerve and muscle simulated childbirth injury model has shown decreased nerve regeneration and increased time to functional recovery compared to either injury alone. The model demonstrates that brain derived neurotrophic factor(BDNF) is dysregulated following the dual injury, instead of being upregulated, which occurs after a nerve injury to facilitate nerve regeneration. Electrical stimulation(ES) of nerves accelerates nerve regeneration via a BDNF-mediated mechanism[3]. We have previously shown that such stimulation increases BDNF expression and improves outcomes following this simulated childbirth injury. To further optimize the stimulation protocol, we hypothesized that daily electrical stimulation will accelerate functional recovery and pudendal nerve regeneration beyond that of a less frequent stimulation protocol in this simulated childbirth injury model.

STUDY DESIGN, MATERIALS AND METHODS

Thirty-five Sprague-Dawley rats were divided up into five groups: two groups received sham injuries, one with electrode implantation with sham stimulation and the other without electrode implantation. The other three groups received PN crush(PNC) and vaginal distension(VD) with electrode implantation either with sham stimulation, 4 times a week(4/week) stimulation, or daily stimulation. Two stainless-steel wires were hooked on the pudendal nerve, flanking the crush site or approximating the crush site in sham injured animals. PNC consisted of bilateral crush twice for 30 seconds, followed by VD for four hours with a modified Foley catheter filled with 3ml water. Sham injury consisted of visualization of the PN without crush injury followed by insertion of the catheter without inflation for four hours. Electrodes were implanted on the PN, tunneled subcutaneously along the dorsal side, externalized at the neck, and were gently bent and sutured to the rat to prevent damage to the wires. Animals were placed under isoflurane anesthesia during stimulation or sham stimulation for one hour. Simulation parameters were 20Hz, 0.1ms, and 0.3mAmp. Stimulation and sham stimulation occurred for two weeks following the injury.

Functional testing occurred 4 weeks after the injury and consisted of Leak Point Pressure(LPP) testing with simultaneous EUS electromyography(EMG), followed by pudendal nerve sensory branch potential testing(PMSBP). Animals were anesthetized with urethane(1.2g/kg) and a suprapubic bladder catheter(flared tip PE-50 tubing) was implanted in the dome of the bladder and was sutured in place with a 4-0 silk purse-string suture. The bladder was filled at a rate of 5ml/hr. Once the bladder was filled to half capacity, increasing pressure was applied to the abdomen until leakage was observed, this was then repeated three times. A parallel recording electrode was place on the EUS to record EMG. The clitoral region was brushed, while recordings were made from the PN sensory branch using hooked parallel recording electrodes. An ANOVA with Sudent-Newman-Keuls test was used to determine significant differences between groups($p < 0.05$). Data presented as mean +/-standard error of the mean. Urethra and pudendal nerves were harvested and flash frozen for qualitative assessment. EUS cross-sections (7 μm) were stained with Massons and a modified Harts stain for histological assessment of muscle, collagen & elastin. Additional cross-sections (14 μm) underwent immunofluorescence staining for neuromuscular junctions (NMJ:alpha-bungarotoxin), striated muscle (phalloidin), and innervating nerves (antibodies to neurofilament 68 and 200). Pudendal nerves

were cross-sectioned and stained for neurofilament 68 and 200 to visualize axons for qualitative assessment.

RESULTS

LPP after sham injury with sham stimulation(39.9+/-2.1cmH2O) was not significantly different from sham injury + no electrodes(NE) (40.6+/-3.2cmH2O). In contrast, LPP after PNC+VD with sham stimulation(19.0+/-2.4cmH2O) was significantly decreased compared to sham injury + sham stimulation, sham injury + NE, and PNC+VD with 4/week stimulation(39.9+/-3.6cmH2O). LPP after PNC+VD with daily stimulation(26.5+/-1.8cmH2O) was significantly increased compared to PNC+VD with sham stimulation, but significantly decreased compared to sham injury + sham stimulation, sham injury + NE, and PNC+VD with 4/week stimulation.

EUS-EMG amplitude and firing rate were not significantly different between sham injury + NE(13.5+/-3.8V; 868.8+/-38.5Hz) and sham injury + sham stimulation(13.7+/-3.7 V; 377.8 +/-71.7 Hz). EUS-EMG amplitudes for PNC+VD with sham stimulation(1.5+/-2.3V) and PNC+VD with daily stimulation(1.2+/-0.5V) were significantly decreased compared to sham injury groups, but PNC+VD with 4/week stimulation(5.8+/-1.8V) was not significantly different compared to sham injured groups. EUS-EMG firing rate was significantly decreased only after PNC+VD with sham stimulation(164.6+/-43.0Hz) compared to sham injured rats. Firing rate after PNC+VD with 4/week stimulation(288.4+/-63.4Hz) or daily stimulation(285.3+/-78.8Hz) were not significantly different from sham injured groups. PNSBP amplitudes and firing rates for sham injury + electrodes(0.2+/-0.1V; 406.7+/-149.3Hz), PNC+VD with sham stimulation(0.1+/-0.0V; 101.0+/-32.3Hz), PNC+VD with 4/week stimulation(0.2+/-0.1V; 160.0+/-90.2Hz), and PNC+VD with daily stimulation(0.1+/-0.0V; 139.8+/-45.2Hz) were significantly decreased compared to sham injury + NE(0.6+/-0.1V; 868.8+/-38.5Hz).

The EUS was disrupted following PNC+VD with sham stimulation compared to sham injured groups. In contrast, EUS morphology after PNC+VD with 4/week stimulation was similar to that of sham injured rats. EUS morphology after PNC+VD with daily stimulation was not as well recovered as with 4/week stimulation. There were fewer elastic fibers in the EUS after PNC+VD with sham stimulation than after sham injury. In contrast, there were more elastic fibers in the EUS after PNC+VD with 4/week stimulation than after daily stimulation, while both showed an increase in elastic fibers compared to PNC+VD with sham stimulation. There were fewer EUS NMJs after PNC+VD with sham stimulation than in sham injured rats; whereas there was increased NMJ staining after PNC+VD with 4/week stimulation compared to sham stimulation. Neurofilament staining was significantly decreased after PNC+VD with sham stimulation compared to sham injured groups. PNC+VD with 4/week stimulation and PNC+VD with daily stimulation had similar staining intensity, but staining was decreased compared to sham injured groups.

INTERPRETATION OF RESULTS

Electrode implantation does not affect LPP, as shown by the sham injured groups. PNC+VD significantly decreased LPP, while 4/week stimulation improved LPP to a greater extent than daily stimulation, suggesting that ES accelerates recovery in this model. EUS-EMG firing rate support these results, while EUS-EMG amplitude suggests that 4/week stimulation is more effective than daily stimulation. Chronic implantation of electrodes affected nerve signaling and ES did not attenuate these effects. Stimulation 4/week improved EUS morphology and increased NMJ staining compared to daily stimulation, supporting the LPP findings. Neurofilament staining supports the findings that ES accelerates recovery in this model.

CONCLUDING MESSAGE

Four/week stimulation and daily stimulation improve functional recovery after PNC+VD, demonstrating that ES can accelerate recovery. Four/week stimulation was more effective then daily stimulation. The nerve potential recordings suggest investigation into non-invasive techniques of nerve stimulation would be beneficial for clinical applications, since electrode implantation affects nerve signaling. This would allow for translation of ES of nerves for the treatment of post-partum SUI and possible prevention or attenuation of later development of SUI.

REFERENCES

1. Snooks SJ, Barnes PR, Swash M. Damage to the innervation of the voluntary anal and periurethral sphincter musculature in incontinence: an electrophysiological study. Journal of neurology, neurosurgery, and psychiatry. 1984;47(12):1269-73.
2. Handa VL, Harvey L, Fox HE, Kjerulff KH. Parity and route of delivery: does cesarean delivery reduce bladder symptoms later in life? American journal of obstetrics and gynecology. 2004;191(2):463-9.
3. Al-Majed AA, Tam SL, Gordon T. Electrical stimulation accelerates and enhances expression of regeneration-associated genes in regenerating rat femoral motoneurons. Cell Mol Neurobiol. 2004;24(3):379-402

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THE USE OF AUTOLOGOUS SKELETAL MUSCLE DERIVED STEM CELLS IN THE TREATMENT OF INDUCED STRESS URINARY INCONTINENCE, AN EXPERIMENTAL STUDY

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HYPOTHESIS / AIMS OF STUDY

Treatment of stress incontinence is challenging. In humans, different techniques evolved throughout ages of research and clinical trials. So far, no standard procedure could be considered "gold". However, Midurethral slings are by far the most world-wide used procedure. MUS are not without risks and are not economic as well. Many trials, both experimental and human attempted to provide an autologous, efficacious and durable tissue-engineered sling.

This is an experimental pre-clinical study, carried out on 10 female mongrel dogs to study the applicability of autologous skeletal muscle derived cells as a seeded Polyglcolic acid (PGA) scaffold slings as a treatment of SUI in canine model

STUDY DESIGN, MATERIALS AND METHODS

The study entailed 10 Mongrel dogs. In 4, Isolation and expansion of muscle-derived stem cells (MDCs):

An open deltoid muscle biopsy was performed. The obtained biopsy specimen of approximately 0.2 g was sent to isolate MDC cells for expansion. Cells were isolated via collagenase Type 1A (Sigma-Aldrich, St. louis, MO, USA) digestion. The cells were cultured on laminin-coated tissue culture flasks in SKGM-2 medium (Lonza, Valkersville, MD). The medium was replaced every 3 days. At confluence, cells were passaged and split 1:2 in tissue culture flasks. After 8 weeks of expansion, the obtained (MDCs) were collected and transported for transplantation.

Characterization of MDCs:

The morphology of the expanded cells was evaluated using phase-contrast microscopy. The expression of a muscle marker, desmin, was assessed immunohistochemically with monoclonal anti-desmin antibodies (DakoCytomation, Glostrub, Denmark).

Cell seeding on scaffolds:

Neoveil absorbable polyglycolic acid sheet (Gunze Limited, Kyoto, Japan) was used. The sheet was cut into pieces (2x3 cm2). The scaffold piece was kept immersed in culture medium supplemented with 10 % fetal bovine serum and 1 % penicillin/streptomycin for 24 h. at 37 oC before seeding. The scaffold was coated with matrigel and MDCs were then seeded at a concentration of I million cells per cm2, and after 24 h, the seeding side was flipped and the other side was coated with matrigel followed by seeding a concentration of 1 million cells per cm2. Both cell-seeded sides were fully immersed in medium during seeding process. The cell-seeded scaffold was cultured for further 3 days in fresh medium supplemented with 10 % fetal bovine serum and 1 % penicillin/ streptomycin at 37 oC and then transferred for transplantation.

Urethral pressure (UPP) measurement was carried out in 8 dogs in which induction of incontinence was performed at baseline and 2 weeks after insertion of the sling, using Gaby machine (Laborie)

6 F dual lumen catheter and 1 ml/min filling rate were used to assess urethral profile in dogs

RESULTS

Four dogs were considered as cases with PGS sling seeded with MDCs while another 4 had only PGA slings without cell seeding.

The urethra with its surrounding tissue was harvested and dogs were sacrificed 4 weeks after sling insertion and were sent for histopathology. 2 dogs were considered as control, in whom no urethrolysis or insertion of slings were carried out

Cross section were taken from dog urethras at the mid urethral segment where the slings have been inserted.

Staining with Hematoxylin and Eosin was carried out first. Masson Trichrome was used as a special stain to identify the presence of muscle fibre aggregates. Desmin immuno histochemical stain was used fro identification of skeletal muscle fibres.

INTERPRETATION OF RESULTS

UPP show increase of maximum urethral pressure during static measurement in all dogs with a scaffold inserted. The increase ranged from 5-40 cmH20 (Median 23 cmH20)

Histopathology shows significant periurethral proliferation of skeletal muscles in 4 dogs with cell-seeded scaffold, as demonstrated by IHC stain with Desmin. This was exceeding the normal urethra of control dogs in case of # 1& 2. This was not the case in the 4 dogs that had only PGA scaffold as a sling, as compared to the normal urethral wall in control dogs. Fig 1 shows Masson trichome stain of section from dog as well IHC desmin stain

CONCLUDING MESSAGE

The use of skeletal muscle –seeded PGA scaffold is a practical technique with preserved integrity of histological differentiation in canine model at short term. It could represent a very goop substitute for autologous slings in humans

FIGURE 1

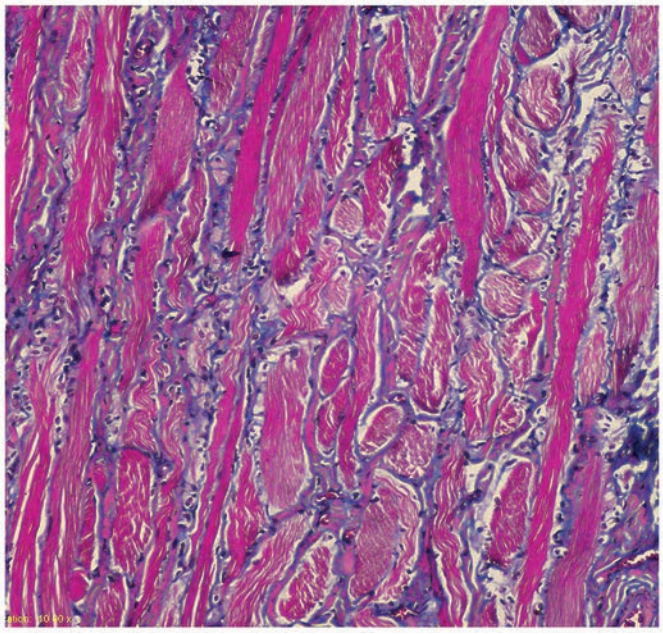
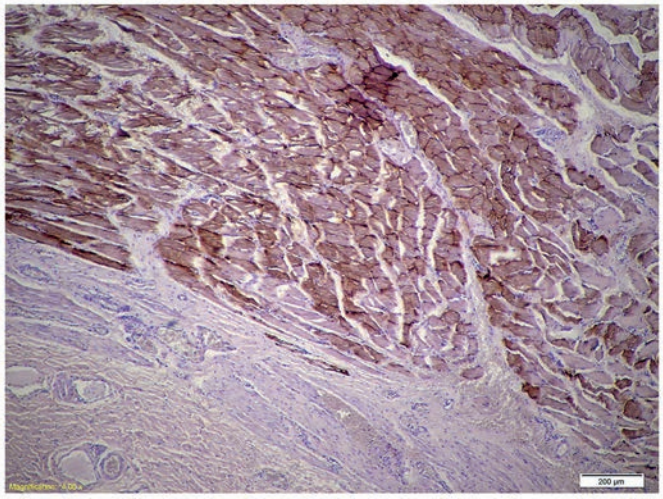


FIGURE 2



Funding Institutional **Clinical Trial** No **Subjects** Animal **Species** Dogs **Ethics Committee** Hospital IRB

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ESTROGEN DEFICIENCY INDUCED BLADDER BLOOD FLOW CHANGES WHEN BLADDER CAPACITY WAS LOW VOLUME

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HYPOTHESIS / AIMS OF STUDY

Menopause and subsequent estrogen deficiency have been implicated in the etiology of overactive bladder (OAB) in elderly females. Recently, attention has focused on ischemia of the bladder as a common pathophysiological mechanism for lower urinary tract symptoms (LUTS), including OAB [1]. In the present study, we investigated the effects of ovariectomy (OVX) and estrogen replacement on bladder blood flow (BBF) with an increase in bladder volume.

STUDY DESIGN, MATERIALS AND METHODS

Virgin Sprague-Dawley rats (24-week old) randomly received a sham operation (SHAM), ovariectomy (OVX), and ovariectomy plus estrogen replacement (OVX+E). In the OVX+E group, the rats were immediately treated with 1mg/Kg weekly injection with β-estradiol for 4weeks.

Four weeks after OVX, rats from the three groups anesthetized with urethane, and the anterior bladder was exposed for the measurement of BBF. Rats were underwent catheter implantation in the bladder . At room temperature, saline was infused at rate of 4ml per hour up to 0.3ml. A laser speckle blood flow imager (OMEGAWAVE, INC. Tokyo, Japan) was used to measure BBF(Fig.1).

RESULTS

When bladder volume was 0ml or 0.1ml, a significant decrease in BBF was observed in OVX rats. BBF in the OVX group was significantly lower than in the SHAM group. This decrease in BBF was significantly suppressed by estradiol treatment . When bladder volume was 0.2ml or 0.3ml, there was no significant difference in BBF(Fig.2).

INTERPRETATION OF RESULTS

The present study showed that OVX reduced BBF (ischemia of the bladder) when bladder capacity was low volume. Estrogen replacement was shown to restore BBF. Since bladder ischemia is known to cause functional and structural alterations of the bladder and estrogen deficiency induce bladder hyperactivity in our previous data, decreased BBF with low bladder volume may play a potential role in the development of bladder hyperactivity in rats with estrogen deficiency.

CONCLUDING MESSAGE

This study implicates that bladder ischemia caused by estrogen deficiency was induced when bladder capacity was low volume.

FIGURE 1

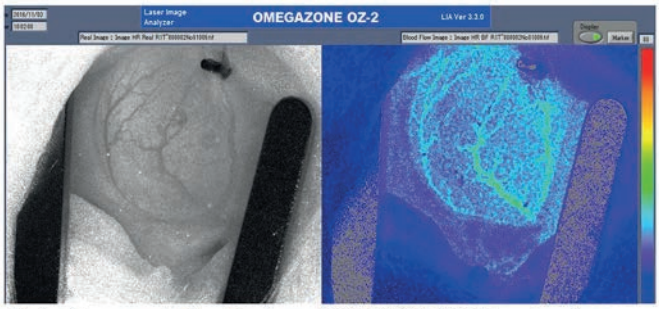

Fig.1 – A lasere speckle Blood flow imager (OMEGAWAVE, INC. Tokyo, Japan) was used to measure bladder blood flow (BBF). Left side is photograph and right side is BBF. Red indicate high blood flow and blue indicate low blood flow.

FIGURE 2

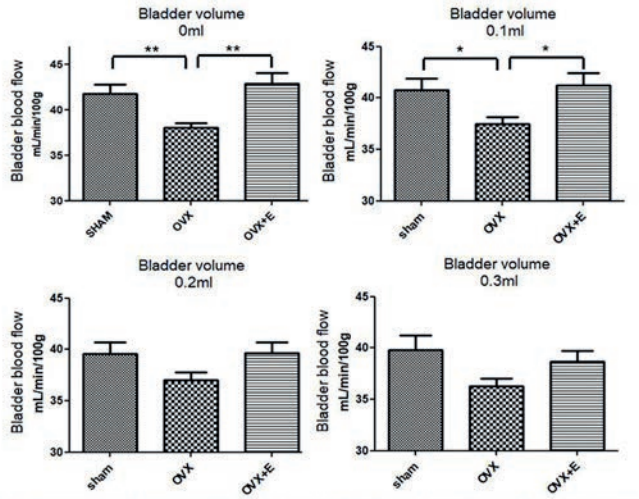

Fig.2 - Bladder blood flow measurements in 9 SHAM, 9 OVX, and 10 OVX+E rats. Double asterisks indicate p < 0.01 and asterisks indicate P < 0.05 SHAM and OVX+E groups vesus OVX group.

Funding No funding and grant **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** Principles in the Care and Use of Animals in the Field of the Physiologic Society of Japan, and the policies of the Institutional Animal Care and Use Committee of the University of Yamanashi (Chuo, Yamanashi, Japan)

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THE ASSOCIATION BETWEEN URINARY INCONTINENCE AND VITAMIN D INSUFFICIENCY IN PREGNANCY

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HYPOTHESIS / AIMS OF STUDY

The aim was to assess associations between urinary incontinence (UI) and Vitamin D insufficiency in mid-pregnancy.

STUDY DESIGN, MATERIALS AND METHODS

This is a secondary analysis of a randomized controlled trial including 855 healthy pregnant women recruited in pregnancy week 18-22. Blood samples were collected after an overnight fasting, and the sera were stored at -80 °C. The analysis of 25-hydroxyvitamin D [25(OH)D] levels was performed on stored sera. Serum 25(OH)D levels <50 nmol/L were classified as Vitamin D insufficiency. Questionnaires regarding prevalence of UI (Sandvik's severity index) were completed. Urinary leakage was classified according to the definitions given in the standardised IUGA/ICS terminology of lower urinary tract symptoms. Women confirming any type of urinary leakage were referred to as having UI, and women reporting leakage with activities increasing abdominal pressure were referred to as having stress urinary incontinence (SUI).

RESULTS

Complete data on level of Vitamin D and UI were available for 823 women. Mean age was 30.5 years, and 57% were nulliparous. Vitamin D insufficiency was found in one third of women. More women with Vitamin D insufficiency reported UI (49% vs. 39%, p<0.01) and SUI (36% vs.25%, p=0.001) compared to women with adequate Vitamin D status.

INTERPRETATION OF RESULTS

Vitamin D insufficiency is prevalent in pregnancy, and has been related to adverse health effects. The presence of Vitamin D receptors in both striated muscle of the pelvic floor and bladder smooth muscle and the findings in the present study suggests that Vitamin D exert influence in the development of UI. Future studies may evaluate the impact of Vitamin D supplementation on UI.

CONCLUDING MESSAGE

The present findings indicate a possible association between Vitamin D insufficiency and incident UI in otherwise healthy pregnant women.

Funding The Norwegian Fund for Postgraduate Training in Physiotherapy **Clinical Trial** Yes **Registration Number Clinical Trial** gov (NCT 00476567) **RCT** Yes **Subjects** Human **Ethics Committee** The Regional Committee for Medical and Health Research Ethics **Helsinki** Yes **Informed Consent** Yes

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ACTIVATION OF PROSTAGLANDIN EP4 RECEPTORS IS AN IMPORTANT CONTRIBUTING FACTOR TO BLADDER OVERACTIVITY IN A RAT MODEL OF NON-BACTERIAL PROSTATIC INFLAMMATION

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HYPOTHESIS / AIMS OF STUDY

There is increasing evidence indicating the positive correlation between prostatic inflammation and lower urinary tract symptoms (LUTS) in male with benign prostatic hyperplasia (BPH) [1] although the underlying mechanism is still unclear. Therefore, in the present study using a rat model of non-bacterial prostatic inflammation, we evaluated the expression profiles of E series prostaglandin receptor subtypes, which are reportedly implicated in development of OAB [2], in the bladder, and investigated the effect of EP4 receptor blockade on bladder overactivity after prostatic inflammation.

STUDY DESIGN, MATERIALS AND METHODS

Male Spraque-Dewley rats were used. Prostatic inflammation was induced by formalin (5%; 50 µl per lobe) injection into bilateral ventral lobes of the prostate. Rats with intraprostatic vehicle injection were used as controls. At 10 days after induction of prostatic inflammation or vehicle injection, bladder tissues were harvested and separated into mucosal and detrusor layers. Then, prostaglandin E2 (PGE2) concentrations in bladder mucosa were measured by ELISA, and protein levels of PGE2 receptors (EP1 to 4) were evaluated by Western blot. In separate groups of control and formalin-treated rats, bladder function was evaluated using awake cystometry to evaluate the changes in bladder activity after prostatic inflammation. Also, the effect of intravesical administration of a selective EP4 receptor antagonist (ONO-AE3-208; 30µM) on bladder activity was evaluated in control rats and rats with prostatic inflammation. The cystometric parameters evaluated included intercontraction intervals (ICI), baseline pressure (BP), pressure threshold (PT), bladder contraction amplitude, post-void residual volume (RV), bladder capacity and non-voiding contraction (NVC) (Table.1).

RESULTS

Compared to vehicle-injected rats, PGE2 concentration and protein levels of EP4 receptors, but not EP1, EP2 or EP3, in bladder mucosa were significantly ($p<0.05$) increased in formalin-treated rats. In cystometry, rats with formalin-induced prostatic inflammation exhibited a significant ($p<0.05$) decrease in ICI compared to vehicle-treated rats. In rats with prostatic inflammation, intravesical application of ONO-AE3-208 (30µM), but not vehicle treatment, significantly increased ICI and bladder capacity (Fig.1 & Table 1) whereas ONO-AE3-208 at this concentration did not significantly affect any CMG parameters in control rats.

INTERPRETATION OF RESULTS

Rats with formalin-induced prostatic inflammation showed bladder overactivity evident as shorter ICI in association with increased PGE2 production and elevated EP4 receptor expression in bladder mucosa whereas other EP receptors did not change after prostatic inflammation. Furthermore, intravesical administration of ONO-AE3-208, a selective EP4 receptor antagonist, ameliorated bladder overactivity as evidenced by increased ICI and bladder capacity without affecting other cystometric parameters including bladder contraction amplitude. These results suggest that the PGE2-EP4 receptor mechanism in bladder mucosa are enhanced to induce bladder overactivity after prostatic inflammation, and that EP4 receptor activation in bladder mucosa is possibly to be implicated in modulation of afferent inputs from the bladder during the storage phase, rather than efferent nerves or bladder contractility that affect voiding function.

CONCLUDING MESSAGE

Because intravesical administration of an EP4 receptor antagonist effectively improved bladder overactivity after prostatic inflammation, EP4 receptor activation along with increased PGE2 production in bladder mucosa seems to be an important contributing factor to bladder overactivity induced by prostatic inflammation. Thus, blockade of EP4 receptors in the bladder could be a therapeutic modality for male LUTS due to BPH with prostatic inflammation.

FIGURE 1

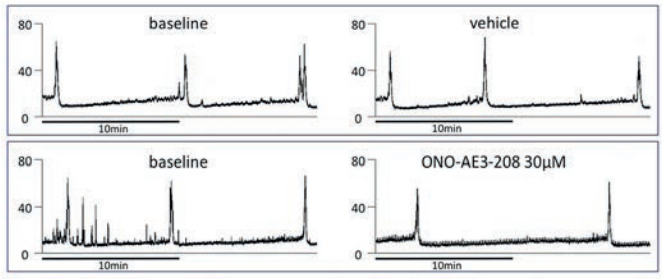

Figure 1. Representative cystometrograms before (baseline) and after intravesical application of ONO AE3-208 (30µM) or vehicle in rats with prostatic inflammation

FIGURE 2

Table 1. Cystometric parameters before and after administration of ONO AE3-208 (30µM) or vehicle in rats with prostatic inflammation

	ICI(sec)	BP	PT	amplitude	NVC/ mictrition	RV(ml)	Bladder capacity (µl)
Baseline	645.7	6.2	12.5	53.2	0.6	8.0	438.4
ONO-AE3-208 (n=6)	861.1	6.4	12.1	52.9	0.4	9.2	583.2
p value	< 0.01	> 0.1	> 0.1	> 0.1	> 0.1	> 0.1	< 0.01
Baseline	557.1	8.4	13.3	52.0	0.9	7.2	378.6
Vehicle (n=5)	576.5	7.7	12.9	48.6	0.7	12.0	396.3
p value	> 0.1	> 0.1	> 0.1	> 0.1	> 0.1	> 0.1	> 0.1

REFERENCES

1. Nickel, J.C., et al., The relationship between prostate inflammation and lower urinary tract symptoms: examination of baseline data from the REDUCE trial. Eur Urol, 2008. 54(6): p. 1379-84
2. Jiang Y, Araki I, Kobayashi H et al. The expression of prostaglandin E2 receptors (EP1, 2, 3 and 4) in the human urinary bladder epithelium of normal and bladder outlet

obstruction- a novel mechanism in the afferent hyperactivity of bladder. 2008 AUA Meeting (Abstract 1318). J Urol 2008; 179: 472

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LONG-LASTING BLADDER OVERACTIVITY AND BLADDER AFFERENT NEURON HYPEREXCITABILITY IN RATS WITH CHEMICALLY-INDUCED PROSTATIC INFLAMMATION

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HYPOTHESIS / AIMS OF STUDY

Benign prostatic hyperplasia (BPH) is a main cause of lower urinary tract symptoms (LUTS), including storage LUTS such as urinary frequency and urgency, in men. Although BPH-induced bladder outlet obstruction (BOO) has been accepted as a major mechanism inducing storage LUTS, an increasing number of clinical studies demonstrate that asymptomatic prostatic inflammation is involved in not only the development of histological BPH but also the emergence of male LUTS, suggesting that prostatic inflammation could be another potential mechanism inducing storage LUTS in BPH patients. Previous studies showed that a rat model of formalin-induced prostatic inflammation exhibits bladder overactivity as evidenced by frequent urination after 4 weeks of injection.[1] However, since an adequate chronic animal model is necessary for further studies, here we aimed to investigate whether the formalin-induced prostatic inflammation in a rat model can lead to long-lasting bladder overactivity and changes in bladder afferent neuron excitability.

STUDY DESIGN, MATERIALS AND METHODS

Male SD rats were used and prostatic inflammation was induced by formalin (5%; 50 µl per lobe) injection into bilateral ventral lobes of the prostate. (1) Metabolic cage: Eight rats were used. Before, 1 week, 4 weesk, and 8 weeks after formalin injection, voiding behaviour was evaluated in metabolic cages. (2) Continuous CMG: Twenty rats were randomly divided into four groups: Control, 1-week, 4-week and 8-week groups. Continuous cystometrograms (CMG) in a conscious condition were recorded on different time points to measure intercontraction intervals (ICI) and voided volume per micturition. (3) Tissue inflammation: After continuous CMG, ventral lobes of the prostate and the bladder were removed to perform HE staining to evaluate inflammation levels. (4) Characterization of afferent neuron excitability: Twenty rats were randomly divided into four groups for patch clamp recordings. L6-S1 dorsal root ganglia (DRG) were removed at different time points, and whole-cell patch clamp recordings were performed on dissociated bladder afferent neurons labelled by FLuoro-gold (FG) injected into the bladder wall, to examine the electrical properties of neurons.

RESULTS

(1) Metabolic cage: Compared to before formalin injection, rats exhibited a significant ($P<0.05$) increase in micturition episodes/24h and decrease in voided volume per micturition after formalin injection at each time point (micturition episodes/24h: 21.7±3.3 [1 week], 21.5±3.7 [4 weeks], and 21.3±3.6 [8 weeks] v.s. 16.7±2.1 [before]; voided volume per micturition (mL): 0.40±0.10 [1 week], 0.41±0.09 [4 weeks], and 0.41±0.14 [8 weeks] v.s. 0.46±0.13 [before]).

(2) Continuous CMG: Compared to control rats, formalin-treated rats with prostatic inflammation exhibited a significantly ($P<0.05$) higher number of non-voiding contractions per void and shorter ICI (Fig 1).

(3) Tissue inflammation: Hematoxylin and eosin staining showed that there were regular shaped acini and intact basement membrane in the prostate tissue of control rats, whereas stromal infiltration of mast cells and lymphocytes and irregular shaped acini were found in prostate tissues of formalin-induced rats. Bladder tissues from any of four groups did not show inflammatory cell accumulation or epithelial formation changes.

(4) Afferent neuron excitablity: In patch clamp recordings, capsaicin-sensitive bladder afferent neurons from rats with prostatic inflammation had significantly ($P<0.05$) lower thresholds for spike activation (-19±18mV [1 week], -22±1.7mV [4 week] and -21±1.8mV [8 weeks], respectively) compared to control rats (-19.5±1.1mV) (Fig. 2). The number of action potentials of bladder afferent neurons during an 800 ms depolarizing pulse was significantly increased after prostatic inflammation at every time point compared to control rats (Fig. 2).

INTERPRETATION OF RESULTS

These results indicate that: (1) formalin prostatic injection can induce chronic inflammation only in the prostate but not in the bladder, (2) formalin induced prostatic inflammation can result in long-lasting bladder overactivity as evidenced by reduced voided volume per micturition and ICI, (3) prostatic inflammation can induce long-lasting hyperexcitability of capsaicin-sensitive C-fiber bladder afferent neurons. Thus, it is assumed that intra-prostatic injection of formalin can induce chronic prostatic inflammation and result in bladder overactivity via sensitization of C-fiber bladder afferent pathways.

CONCLUDING MESSAGE

Formalin-induced prostatic inflammation can induce long-lasting bladder overactivity in rats evident as frequent micturition and increased non-voiding contractions in association of bladder afferent neuron hyperexcitability. Clinically, chronic prostatic inflammation might contribute to storage LUTS in BPH patients through affecting bladder afferent neuron excitability, and this long-lasting model of prostatic inflammation would be useful for the study of inflammation-related aspects of male LUTS pathophysiology.

FIGURE 1

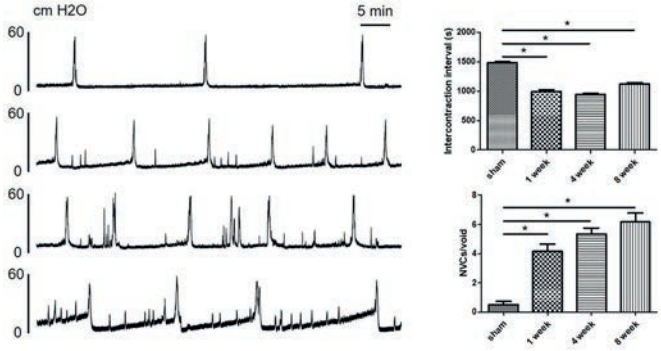
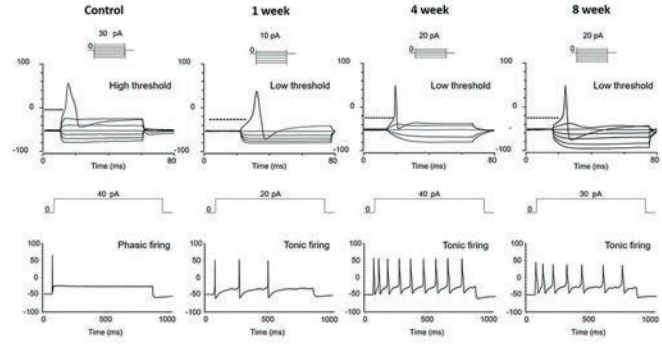


FIGURE 2



REFERENCES

1. Mizoguchi, S., Mori, K., Wang, Z. et al.: Effects of Estrogen Receptor beta Stimulation in a Rat Model of Non-Bacterial Prostatic Inflammation. Prostate, 77: 803, 2017

Funding NIH U54 DK112079 **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** the University of Pittsburgh Institutional Animal Care and Use Committee

494 www.ics.org/2018/abstract/494

COMPLEMENT ACTIVATION MECHANISM ACTIVATED BY AUTOANTIGEN RECOGNITION DURING GROWTH OF BENIGN PROSTATIC HYPERPLASIA

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HYPOTHESIS / AIMS OF STUDY

The association between the pathogenesis of benign prostatic hyperplasia (BPH) and inflammation has recently received attention. We previously showed that not only the inflammation response pathway, but also the classical complement pathway is activated in BPH tissue from model rats with stroma-dominant BPH. The classical complement pathway is activated by autoantigens that recognize immunocomplexes and it is responsible for various diseases via a mechanism that amplifies inflammation. We postulated that immunocomplexes amplify inflammation through complement activation, which leads to prostatic proliferation. Therefore, we expressed complement factors, analyzed their functions, and identified autoantigens to understand the pathogenic mechanism of BPH.

STUDY DESIGN, MATERIALS AND METHODS

Fetal urogenital sinus (UGS) isolated from male 20-day-old rat embryos was implanted into the ventral prostate of pubertal male rats to create rat models of BPH. Complement factors were expressed and functionally analyzed in BPH tissues, and then serum concentrations of IgG and the expression of complement factors in BPH tissues were assessed. We immunoprecipitated BPH protein using an anti-IgG antibody to identify antigens, and analyzed the protein by mass spectrometry after SDS-PAGE separation. The expression of complement factors in human BPH tissue was also analyzed.

RESULTS

The expression of complement factors C1q, C3, MBL, Factor B, and MAC was significantly up-regulated in tissues from BPH rats compared with those from normal rats (Fig 1. $p<0.01$). The classical complement pathway was initially activated, followed by an alternative complement pathway activated in BPH. These complement factors were also up-regulated mostly in stromal areas of human BPH. The serum IgG concentration was significantly increased (398.1 ng/mL, $p<0.01$) in rat BPH and IgG was deposited in stromal areas of the BPH. Mass spectrometry of IgG binding protein identified Annexin, Hsp90, α-SMA, and β-actin as antigens of immunocomplexes.

INTERPRETATION OF RESULTS

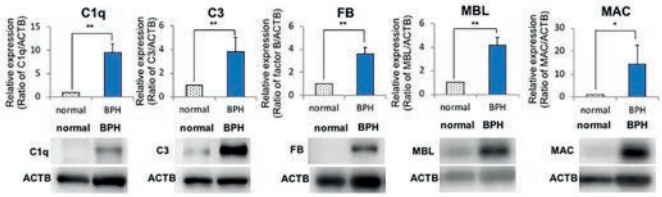
Annexin, Hsp90, and β-actin are known to present in various cells. It has also been reported that these molecules are exposed as antigen on the cell surface due to cytotoxicity by stimulation such as ischemia. On the other hand, α-SMA is reported as a marker of myofibroblast in BPH and

is thought to be involved in the BPH growth process. In this present study, antigen-antibody reaction recognizing these molecules as autoantigen is occurring in BPH growth processs. Subsequently, immunocomplexes activates classical complement pathway through binding to C1q , and then, lectin pathway, alternative pathway is activated. Complement system activation was thought to be responsible for the proliferation process of BPH by various inflammatory cell proliferation and tissue remodeling. In other words, the autoimmune reaction has possibilities to be involved in the growth process of BPH.

CONCLUDING MESSAGE

We clarified that the immune system is responsible for the development of BPH. Complement pathway activation by immunocomplexes recognizing Annexin, Hsp90, α-SMA, and β-actin as autoantigens might be responsible for the pathogenesis of BPH.

FIGURE 1



Funding None **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** Animal Care Committee of Fukushima Medical University

495 www.ics.org/2018/abstract/495

THE DISTRIBUTION AND FUNCTIONAL ROLE OF ADENOSINE RECEPTOR SUBTYPES IN THE BLADDER OF MALE RATS WITH BLADDER OUTLET OBSTRUCTION

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HYPOTHESIS / AIMS OF STUDY

This study is the first report to elucidate the distribution and functional role of adenosine receptor subtypes in the bladder of male rats with bladder outlet obstruction (BOO). Storage symptom, similar to overactive bladder (OAB), in elderly man with BOO related to benign prostate enlargement (BPE) is often resistant to treatments. Recent studies using female rats have reported that adenosine receptor modulation using A2A receptor antagonists or A2B receptor agonists including inosine can affect bladder function. However, the adenosine receptor mechanism underlying BOO-induced bladder dysfunction is not well elucidated, Furthermore, previous BOO research mainly utilized female BOO animals. Therefore, this study examined the expression of adenosine receptors and the effects of adenosine receptor modulation on bladder activity using the male BOO rat model.

STUDY DESIGN, MATERIALS AND METHODS

In male Sprague-Dawley rats (8-weeks old), BOO was produced under isoflurane anesthesia. After the lower abdominal incision, 4-0 silk suture was placed around the urethra, including a metal rod with an outer diameter of 1.2mm placed extraluminally at the urethrovesical junction level proximal to the urethral fenestration [1]. After tying the suture, the rod was removed. Sham operated animals were used as controls. After baseline awake cystometrograms (CMG) were obtained with saline, we intravesically applied an adenosine A1 receptor agonist (CCPA, 4.1 μM) or an adenosine A2A antagonist (ZM241385, 15 μM), or inosine (1 mM) [2] to BOO (n=6, each agent) and sham rats (n=4, each agent). Furthermore, mRNA levels of adenosine receptor subtypes such as A1 (ADORA1), A2A (ADORA2A), A2B (ADORA2B), and A3 (ADORA3) receptors in bladder mucosa and detrusor were analysed by RT-PCR. Totally, we used 38 BOO rats and 32 age-matched sham rats in this study. Thirty of 38 BOO and 24 of 32 sham rats underwent CMG, and the remaining 8 BOO rats and 8 sham rats were used for molecular studies.

RESULTS

Bladder weight of BOO rats was significantly increased (0.35±0.041 g vs. 0.11±0.0048 g, respectively, p<0.0001) compared to sham rats. In CMG, BOO rats were significantly increased in the amplitude during voiding (91±6.5 cmH2O vs. 40±2.2 cmH2O, respectively, p<0.0001), a number of non-voiding contractions (0.91±0.15 /min vs. 0.11±0.025 / min, respectively, p=0.00020), post-void residual (1200±230 μl vs. 20±8.4 μl, respectively, p=0.0004), bladder capacity (2000±240 μl vs. 860±32 μl, respectively, p=0.0006), and compliance (0.89±0.17 ml/H2O vs. 0.31±0.032 ml/H2O, respectively, p=0.0051) compared to sham rats (figure 1). Voiding efficiency (VE) was decreased in BOO rats compared to sham rats (46±6.9 % vs. 98±0.89 %, respectively, p<0.0001). In sham rats, intravesical administration of CCPA, ZM241385 or inosine did not have any effect on CMG parameters. In BOO rats, CCPA and Inosine did not have any effect on CMG parameters; however, ZM241385 significantly reduced NVCs in BOO rats (0.50±0.079 /min vs. 0.90±0.15 /min, respectively, p=0.028) (figure 2). mRNA expression levels of adenosine A2A receptors and A3 receptors in bladder mucosa were significantly increased in BOO rats compared to sham rats (p<0.0001, p=0.0145, respectively). In contrast, mRNA expression levels of adenosine A2B receptors in bladder mucosa was significantly decreased in BOO rats compared to sham rats (p<0.0001). There was no significant difference in adenosine receptor expression in detrusor between BOO and sham rats.

INTERPRETATION OF RESULTS

Referring to previous reports of female BOO rats [3], the results of bladder weight and CMG parameters in our male 4-week BOO rats were compatible to the early decompen-

sated phase; i.e. bladder contractility and bladder capacity are preserved, but VE is significantly decreased. The therapeutic effect of ZM241385 on bladder overactivity evident as reduced NVCs in our male BOO rats may be related to the increased expression of adenosine A2A subtype receptors in bladder mucosa. In addition, the reduction of adenosine A2B mRNA levels may contribute to the negative effect of inosine, which reportedly suppresses bladder activity via adenosine A2B receptor stimulation [2].

CONCLUDING MESSAGE

The male BOO rat model is useful to understand the pathophysiology of early decompensated phase of bladder dysfunction related to male BOO. Also, adenosine receptor subtypes such as A2A receptors could be a therapeutic target for male patients with OAB due to BPE-induced BOO.

FIGURE 1

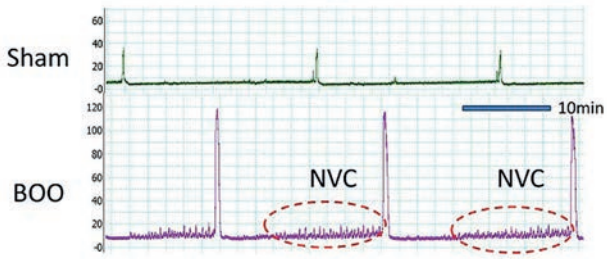

Figure 1. Cystometrograms showing non-voiding contractions (NVC) in BOO rats

FIGURE 2

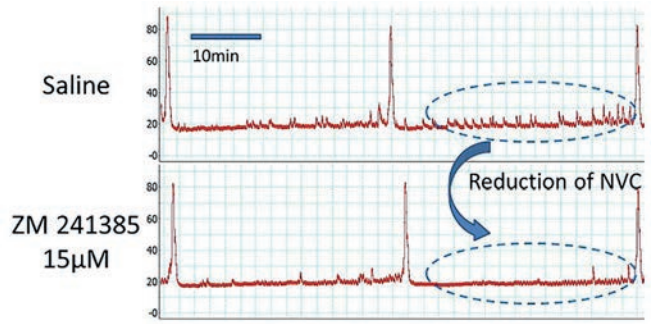

Figure 2. Effects of adenosine A2A receptor antagonsist (ZM241385)

REFERENCES

1. Zvara P, Kliment J Jr, DeRoss AL, Irwin BH, Malley SE, Plante MK, Vizzard MA. Differential expression of bladder neurotrophic factor mRNA in male and female rats after bladder outflow obstruction. J Urol. 168: 2682-2688, 2002.
2. Doyle C, Cristofaro V, Sack BS, Lukianov SN, Schäfer M, Chung YG1, Sullivan MP, Adam RM. Inosine attenuates spontaneous activity in the rat neurogenic bladder through an A2B pathway. Sci Rep. 7: 44416, 2017.
3. Metcalfe PD, Wang J, Jiao H, Huang Y, Hori K, Moore RB, Tredget EE. Bladder outlet obstruction: progression from inflammation to fibrosis. BJU Int. 106:1686-1694, 2010.

Funding NIH U54 DK112079 **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** University of Pittsburgh Institutional Animal Care and Use Committee

496 www.ics.org/2018/abstract/496

MORPHOLOGICAL CHANGES OF MYOFIBROBLASTS IN DIFFERENTIATION PROCESS PROMOTE PROSTATIC FIBROSIS IN BENIGN PROSTATIC HYPERPLASIA

Hata J[1], Onagi A[1], Tanji R[1], Takinami R[1], Hoshi S[1], Kurimura Y[1], Sato Y[1], Ogawa S[1], Kataoka M[1], Haga N[1], Ishibashi K[1], Kojima Y[1]
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HYPOTHESIS / AIMS OF STUDY

Benign prostatic hyperplasia (BPH) shows increases in the proportion of fibrous components as it grows, and patients with abundant fibrous components typically require surgery. Myofibroblasts are reportedly associated with tissue fibrosis in several organs; their differentiation is induced by TGF-β1 and IGFBP3, thereby promoting fibrosis through growth factors or extracellular matrix. However, the process of fibrosis in BPH remains unclear. Therefore, to clarify the mechanisms of prostatic fibrosis in BPH, we analyzed the qualitative and quantitative changes in myofibroblasts during the growth process of BPH using model rat and human BPH tissues.

STUDY DESIGN, MATERIALS AND METHODS

Fetal urogenital sinus (UGS) isolated from male 20-day-old rat embryos was implanted into the ventral prostate of pubertal male rats to create rat models of BPH. Using BPH tissues and left ventral prostate as a control, the number of myofibroblasts positive for α-SMA and vimentin was evaluated by immunohistochemical staining. Expression of TGF-β1 and IGFBP3 was also evaluated by western blotting and immunohistochemical staining (n=4). In addition, using BPH model rats at 2 weeks, 3 weeks, and 8 weeks after UGS implantation (n=4), histological and expression analyses were performed with time. Furthermore, the fine morphological characteristics of myofibroblasts were evaluated by electron microscopy using human BPH tissues. For statistical analyses, an un-paired t test was used and $p < 0.05$ was considered to indicate significant differences.

RESULTS

BPH tissues showed a significant increase (9.2%) in the number of myofibroblasts ($p<0.05$) when compared with normal prostate (4.5%), and these were abundantly located in stromal area (Fig 1,2). Expression of both TGF-β1 and IGFBP3 was significantly up-regulated in BPH ($p<0.05$). The number of myofibroblasts and the expression of TGF-β1 and IGFBP3 increased time-dependently ($p<0.05$), and the expression of these growth factors increased ahead of myofibroblasts. Electron microscopy confirmed that the myofibroblast progenitor cells, which possess abundant stress fibers, were predominantly located around fibrous areas in human BPH.

INTERPRETATION OF RESULTS

These results showed that myofibroblasts works as promotor of fibrosis in the growth of BPH. In addition, it is expected that fibroblast-myofibroblast differentiation was locally activated in BPH tissues. Interestingly, the study of electron

microscopy demonstrates the presence of myofibroblast progenitor cells which have characteristics of fibroblasts and myofibroblasts. Although further study needed, myofibroblaast progenitor cells have the possibilities of new therapeutic targets.

CONCLUDING MESSAGE

Differentiation into myofibroblasts induced by TGF-β1 and IGFBP3 actively occurred during the BPH growth process. We also confirmed that myofibroblast progenitor cells are able to promote prostatic fibrosis in BPH.

FIGURE 1

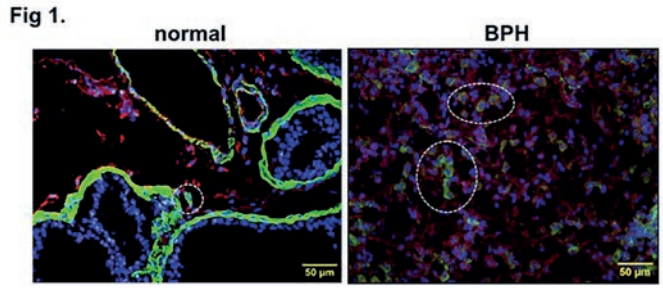
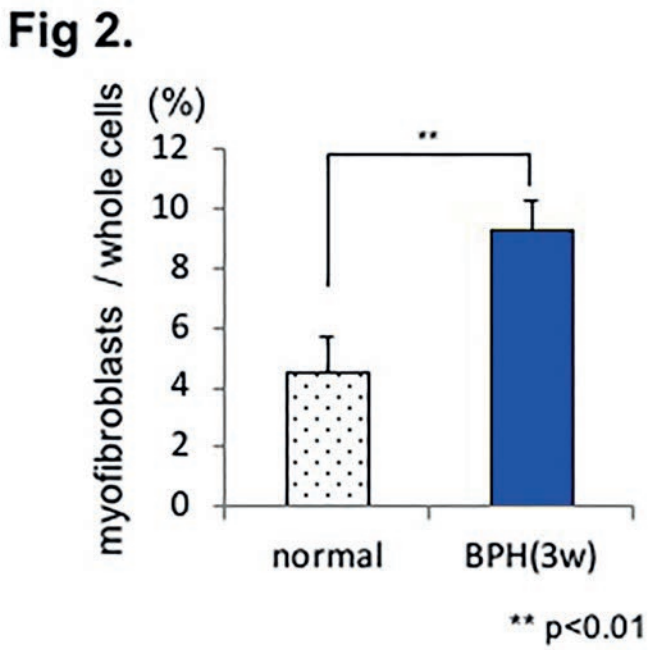


FIGURE 2



Funding None **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** Animal Care Committee of Fukushima Medical University

609 www.ics.org/2018/abstract/609

THE IMPACT OF THE USE OF VACCINE AGAINST RECURRENT URINARY TRACT INFECTIONS IN FRAIL ELDERLY PATIENTS

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HYPOTHESIS / AIMS OF STUDY

There is no clear consensus on the definition of frailty; however, it is proposed that frailty comprises a collection of biomedical factors which influences an individual's physiological state in a way that reduces his or her capacity to withstand environmental stresses. Only a subset of older people are at risk of becoming frail; these are vulnerable, prone to dependency and have reduced life expectancy. These health outcomes contribute to an increased demand for medical and social care, and are associated with increased economic costs (1).

In urology, antimicrobial stewardship programmes should include a series of measures to ensure rational, evidence based use of antimicrobials in the prevention and treatment of infections of the urinary tract and male accessory glands, as well as non-antimicrobial strategies (2).

The objectives of this study are:

1. To know factors related to the presence of urinary tract infections in frail institutionalized older adults.

2.To propose improved measures in the management of recurrent urinary tract infections avoiding antimicrobial prophylaxis.

STUDY DESIGN, MATERIALS AND METHODS

Multicentric prospective study in institutionalized people diagnosed with recurrent urinary tract infections.

Intervention: alternative random assignment 1/1 successive to each group.

Study groups:

- Group A (n = 50): patients receiving continuous low-dose antibiotic prophylaxis;

- Group B (n = 50): patients receiving prophylaxis with a polybacterial vaccine (Uromune ®).

Age, gender, number of urinary tract infections, secondary diagnoses, concomitant treatments, health-related quality

of life relative to UTI measured with a visual analogue scale (VAS: 0 = worst, 10 = best) were analysed.

Descriptive statistics, ANOVA, Student's t test, Fisher's exact test, Pearson's correlation test were performed; $p < 0.05$ was considered significant.

RESULTS

Patients in the sample were 56 women (56%) and 44 men, which were equally distributed in both groups (Group A: 28 women and 22 men; Group B: 28 women and 22 men).

Regarding average age, no differences were found in the whole sample (women: 83.71 years; men: 80.17 years; $p = 0.3112$). Mean number of urinary tract infections per year before prophylactic treatment: 8 (SD: 5.31).

At follow-up, the average number of urinary tract infection per month was higher in Group A (mean: 0.66, SD: 0.31) than in Group B (mean: 0.212, SD: 0.14) ($p < 0.0213$).

There was no difference in the guiding symptom between groups ($p = 1.0000$): agitation (24.5%), dysuria (24.5%), disorientation/confusion (15.5%), haematuria (12.5%), malodorous urine (8.5%), general deterioration (4.5 %), decrease in consciousness (4.5%), oligosymptomatic (5.5%).

No differences between Group A and Group B were found regarding Combur test results, urine culture or pre-intervention secondary diagnoses ($p = 1.0000$).

The number of urinary tract infections was related to constipation, urinary incontinence's severity, neurological disorders and renal failure.

Average VAS was higher in Group B (mean: 7.1 SD: 0.55) with respect to Group A (mean 2.31, SD 0.87) ($p < 0.0001$). The VAS was lower in cases of severe urinary incontinence / greater number of absorbents compared to other secondary diagnoses.

INTERPRETATION OF RESULTS

Developed countries' populations tends to ageing. Antibiotic treatment may cause gastrointestinal disorders in elderly patients, in addition to increasing antibiotic-resistant microorganisms. This study shows the efficacy and benefit of the use of the polybacterial vaccine (Uromune ®) in this specific population. This vaccine favours immunoactive prophylaxis using a suspension of inactivated complete cells of differents strains of Escherichia coli, Klebsiella pneumoniae, Proteus mirabilis and Enterococcus faecalis. It is worth underlining that the sublingual administration of this vaccine is easy and comfortable, being practical for its use in institutionalised and dependent patients.

CONCLUDING MESSAGE

The polyvalent bacterial vaccine is effective in the reduction of UTI against continuous low-dose antibiotic prophylaxis in frail institutionalized older adults and provides improvement in the quality of life. Severe urinary incontinence, that requires the use of absorbents to a greater degree, worsens the management of UTIs in the frail institutionalized elderly.

REFERENCES

1. Lally F, Crome P. Understanding frailty. Postgraduate Medical Journal. 2007;83(975):16-20. doi:10.1136/pgmj.2006.048587.
2. G. Bonkat (Co-chair), R. Pickard (Co-chair), R. Bartoletti, F. Bruyère, S.E. Geerlings, F. Wagenlehner, B. Wullt Guidelines Associates: T. Cai, B. Köves, A. Pilatz, B. Pradere, R. Veeratterapillay. EAU Guidelines on Urological Infections, 2018. Available at: http://uroweb.org/guideline/urological-infections/

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** IRB Complejo Hospitalario Universitario de Salamanca **Helsinki** Yes **Informed Consent** Yes

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POSSIBLE USEFULNESS OF BLOOD INFLAMMATORY MARKER C-REACTIVE PROTEIN AS A BIOMARKER FOR HUNNER LESIONS IN INTERSTITIAL CYSTITIS

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HYPOTHESIS / AIMS OF STUDY

Gross findings from cystoscopy and pathohistological findings from bladder biopsy are important in interstitial cystitis (IC) diagnosis. Differential diagnosis between non-Hunner (N type) and Hunner-type (H type) lesions is known to greatly influence disease prognosis and patient quality of life. If the H type, which is thought to be a more severe IC, is treated appropriately with electrical ablation, the treatment outcome with bladder hydrodistension alone would be insufficient. However, limitations of the invasive gross diagnosis using cystoscopy and bladder biopsy are self-evident. Furthermore, no consistent standard has yet been established for pathohistological diagnosis using biopsy. Therefore, discovering a convenient and useful biomarker for differential diagnosis of the two disease types is necessary.

Recently, there have been a few reports on correlation between blood inflammatory markers and disease prognosis in chronic inflammation and malignant tumors. Therefore, we assessed usefulness of presurgical serum C-reactive protein (CRP) level as a biomarker for Hunner lesions in IC prior to performing bladder hydrodistension.

STUDY DESIGN, MATERIALS AND METHODS

This study included the participants who were diagnosed with or without IC at our hospital between April 2007 and September 2017.

Patients suspected of having IC were enrolled and divided into non-IC hypersensitive bladder (S), N type (N), and H type (H) groups according to cystoscopy findings during surgery. A normal group (control [C]), consisting of patients free of urinary disorders, was also included. Serum CRP levels among the 4 groups were compared and correlations of preoperative CRP levels with the IC Symptom Index (ICSI)/IC Problem Index (ICPI) and the presence of Hunner lesions were evaluated. Patients with acute phase infections such as urinary tract infections and chronic inflammatory systemic diseases such as rheumatoid arthritis and collagen disease were excluded from this study. This study was approved by the ethics committee of our institution.

RESULTS

Of the 162 subjects analyzed, 54 were male (mean age, 65.4 ± 12.7 years). Table shows that the participants' characteristics and preoperative serum CRP levels. There was no statistically significant difference in the ratio of men to women in the participants among four groups. Serum CRP levels were as follows: C group (n = 57), 0.04 ± 0.03 mg/dL; S group (n = 54), 0.06 ± 0.05 mg/dL; N group (n = 18), 0.05 ± 0.04 mg/dL; and H group (n = 33), 0.13 ± 0.12 mg/dL. The H group had significantly higher serum CRP levels than the other 3 groups ($P < 0.001$). Both total ICSI (H group, 13.4 ± 3.8; N group, 8.2 ± 3.3; $P < 0.001$) and total ICPI scores (H group, 11.5 ± 3.6; N group, 6.9 ± 3.0; $P < 0.001$) were significantly higher in the H group than in the N Group. Moreover, both the total ICSI and total ICPI scores were positively correlated with CRP level (ICSI: $r = 0.486$, $P < 0.001$; ICPI: $r = 0.527$, $P < 0.001$). The sensitivity and specificity of CRP levels were 72.7% and 77.8%, respectively, with an area under the curve of 0.777 in ROC analysis for presence of Hunner lesion; CRP level cutoff value was 0.07 mg/dL.

INTERPRETATION OF RESULTS

Unfortunately, from the results of this study, we could not differentiate between interstitial cystitis and non-IC hypersensitive bladder or normal bladder with CRP values.

Although serum CRP levels alone were insufficient for differential diagnosis between N-type IC and hypersensitive bladder, preoperative CRP levels were high in H-type IC patients. The results suggest the potential usefulness of CRP levels as a presurgical marker in the differential diagnosis of Hunner lesions. Additionally, CRP levels correlated with the severity of IC symptoms.

CONCLUDING MESSAGE

Serum CRP levels might be a marker for the presence of Hunner lesion in patients with interstitial cystitis.

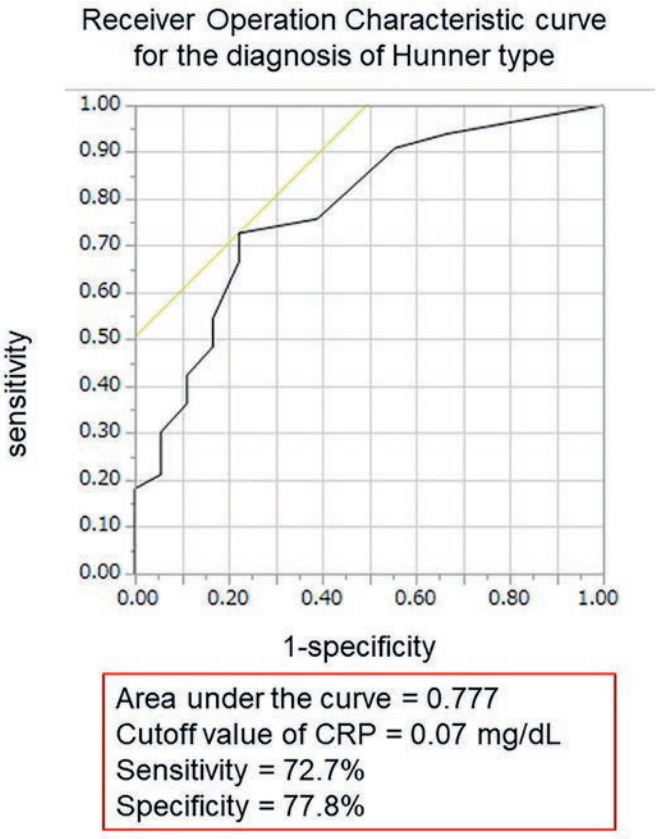
FIGURE 1

Patients' characteristics and preoperative serum CRP level

	Entire	C group	S group	N group	H group	P value
Gender Male / Female	162 (54/108)	57 (26/31)	54 (16/38)	18 (4/14)	33 (8/25)	0.093
Age (years)	65.4 ± 12.7	63.5 ± 13.7	69.7 ± 12.6	61.8 ± 11.3	63.6 ± 9.8	0.006
Serum *CRP (mg/dl)	0.06 ± 0.07	0.04 ± 0.03	0.06 ± 0.05	0.05 ± 0.04	0.13 ± 0.12	< 0.001

*C-reactive protein

FIGURE 2



Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Nagasaki University Hospital **Helsinki** Yes **Informed Consent** Yes

611 www.ics.org/2018/abstract/611

THE ROLE OF VIRAL INFECTION IN THE PATHOGENESIS OF IC/BPS –A STUDY OF URINARY VIRUS IN PATIENTS WITH IC/BPS AND THEIR CLINICAL CORRELATIONS

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HYPOTHESIS / AIMS OF STUDY

Although the diagnosis of interstitial cystitis and bladder pain syndrome (IC/BPS) should be made after ruling out bacterial cystitis, microorganism infection in the bladder still has been considered as a possible etiology of IC/BPS. Early viral studies of IC/BPS revealed conflicting results due to small case number. The aim of current study is using polymerase chain reaction (PCR) to investigate different kinds of virus load in the urine of patients with IC/BPS.

STUDY DESIGN, MATERIALS AND METHODS

From 2017 to 2018, IC/BPS patients who were admitted to our hospital for hydrodistention were prospectively enrolled into this study. Before the hydrodistention (under general anesthesia), urine from patients with IC/BPS was collected via urethral catheterization after the standard aseptic procedures. The patients with stress urinary incontinence in outpatient clinic were also asked to collect urine. The midstream urine specimens were taken and were considered as control subjects. Using PCR, the urine samples were investigated for virus DNA including adenovirus (139-bp region of the hexon gene), bocavirus (NP-1 gene), BK virus (UCL-F1 gene) and herpes viruses (HSV, multiplex PCR, including HSV-1, HSV-2, Epstein–Barr virus, cytomegalovirus and varicella-zoster virus).

RESULTS

A total of 54 IC/BPS patients (56.6±12.4 years old) and 51 control subjects (66.8±12.2 years old) urine samples were investigated by virus DNA PCR. The urine bocavirus was detected in 11 (20.4%) IC/BPS patients and 6 (11.8%) control subjects (p=0.233). The urine adenovirus was detected in 6 (12%) IC/BPS and 12 (23.5%) control subjects (p=0.132). All urine samples, including control and IC/BPS patients, were negative for HSV and BK virus. The clinical parameters between IC/BPS patients with positive or negative urinary virus do not have significant difference (Table 1). Among the 8 IC/BPS patients with Hunner's lesion, 2 of them were positive for urinary bocavirus, and only one was positive for urinary adenovirus.

INTERPRETATION OF RESULTS

Current study might be the largest series to investigate urinary virus load in patients with IC/BPS. Our data revealed using PCR could detect urinary bocaviorus and adenovirus DNA in IC/BPS patients and control subjects. However, HSV and BK virus could not be detected in our PCR study. Virus infection as a possible etiology of IC/BPS had been a long-standing debatable issue. Our study does not show significant association between urinary virus load and IC/BPS. Further investigations using different PCR primers or in situ hybridization to detect virus presence in IC/BPS bladders are necessary to explore the role of virus in the pathogenesis of IC/BPS.

CONCLUDING MESSAGE

Our large IC/BPS patient series does not showed significant association between urinary virus load and IC/BPS. Further investigations using different PCR primers to detect virus presence in IC/BPS are necessary to explore the role of virus in IC/BPS.

FIGURE 1

Table 1. Clinical parameters between IC/BPS patients with positive or negative urinary virus

	Bocavirus			Adenovirus		
	Positive N=11	Negative N=43	p-value	Positive N=6	Negative N=48	p-value
VAS	3.6±3.4	3.0±2.8	0.615	3.8±2.4	3.0±2.9	0.886
ICSI	9.7±5.3	8.7±4.0	0.557	9.2±3.4	8.8±4.3	0.842
ICPI	9.1±4.2	9.3±3.9	0.912	11.2±3.3	9.0±4.0	0.211
OSS	18.9±9.1	18.3±7.6	0.857	22±6.9	17.8±7.8	0.220
CBC (mL)	225.0±165.8	266.8±125.0	0.480	315.0±201.9	251.9±118.6	0.320
MBC (mL)	550.0±217.9	633.3±163.0	0.248	540.0±89.4	630.3±179.2	0.278

VAS: Visual Analogue Scale for pain; ICSI: Interstitial Cystitis Symptoms Index; ICPI: Interstitial Cystitis Problem Index; OSS: O'Leary-Saint symptom score; CBC: cystometric bladder capacity; MBC: maximal bladder capacity under general anesthesia

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Research **Ethics Committee**, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation **Helsinki** Yes **Informed Consent** Yes

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CONTEMPORARY OUTCOMES OF SURGERY FOR BLADDER PAIN SYNDROME/ INTERSTITIAL CYSTITIS

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HYPOTHESIS / AIMS OF STUDY

Bladder pain syndrome (BPS) (previously known as interstitial cystitis and painful bladder syndrome) is a chronic benign condition of unknown aetiology. It is defined by the European Society for the Study of Interstitial Cystitis/Bladder Pain Syndrome (ESSIC) as "chronic (>6months) pelvic pain, pressure or discomfort perceived to be related to the urinary bladder accompanied by at least one other urinary symptom like the persistent urge to void of frequency". Management of BPS is multi-modal with a variety of treatments available however good quality evidence for many is lacking and there is no global consensus for optimum management. The role of surgery is uncertain and currently reserved for pa-

tients who are considered refractory to treatment. European Association of Urology guidelines for BPS suggest patients should only undergo surgery as a "last resort" and should be managed in a specialist centre. No particular surgical technique is recommended however total cystectomy with ileal conduit is the most common. Other described techniques are supratrigonal or subtrigonal cystectomy with augmentation or total cystectomy and orthotopic neobladder formation. We aimed to report our experience and outcomes of surgical intervention for bladder pain syndrome in a tertiary referral centre.

STUDY DESIGN, MATERIALS AND METHODS

A retrospective review was performed on all patients who underwent cystectomy or subtotal cystectomy between 2007 and 2017. Data was collected from physical and electronic case notes as well as radiology and pathology computer systems. Primary outcome measures were pain and frequency. Secondary outcome measures were complication and mortality rates. 34 patients were identified, 5 male (14.7%) and 29 female (85.3%). The median age was 49.5 years (range 30-79). The mean duration of symptoms between diagnosis and procedure was 6.4 years. All 34 patients had documented chronic pain perceived to be related to the bladder. The median episodes of nocturia was 6 and median daytime frequency was 1 hourly. 19 patients had a previous history of pelvic surgery and 4 had a history of fibromyalgia. All patients were considered refractory to treatment and had undergone a wide range of previous management modalities. Median bladder capacity under general anaesthetic was 500ml with mean maximum cystometric capacity of 275ml.

RESULTS

Median follow-up was 32 months. 27 patients underwent total cystectomy (79.4%) – 23 had an ileal conduit diversion and 4 had a neobladder constructed with mitrofanoff formation. 7 patients underwent subtotal cystectomy and augmentation cystoplasty with ileum (20.6%). There were no intraoperative complications. Median length of stay overall was 13.5 days (Subtotal cystectomy and augmentation 14 days, total cystectomy and ileal conduit 13 days, total cystectomy and neobladder and mitrofanoff formation 16 (days). Clavien-Dindo grade 3 or above complications occurred in 4 patients (11.8%). Persistent pain occurred in 8 patients overall (23.5%). 50% (2) of those who underwent total cystectomy and neobladder and mitrofanoff formation continued to have pain; one of whom proceed to excision of neobladder and formation of ileal conduit, they were pain free following excision. 28.6% (2) of patients who underwent subtotal cystectomy with augmentation compared to 17.3% of patients who had undergone total cystectomy and ileal conduit formation.

INTERPRETATION OF RESULTS

The management of BPS can be very difficult due to the unknown aetiology and wide range of symptoms that can be experienced by patients suffering from the condition. Surgical intervention is reserved for cases refractory to all other treatment methods however there is limited evidence regarding the optimal surgical procedure. We have demonstrated that 76.5% of patients in our unit undergoing surgery for BPS had resolution of their pain with a complication rate of 11.8%. However it should be emphasised that all patients undergo extensive counselling with the surgical team, specialist nurse and stoma nurse before embarking on surgery.

CONCLUDING MESSAGE

Surgery for patients with BPS is reserved for patients with severe symptoms who are considered refractory to other treatment options. In our experience patients have lower rates of persistent pain following total cystectomy and ileal conduit formation compared to subtotal cystectomy and augmentation and total cystectomy with neobladder formation. It is important that all patients with refractory BPS are fully counselled pre-operatively in order to manage expectations and consider the risks of any procedure fully before embarking on surgical intervention.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Anonymous data collection **Helsinki** Yes **Informed Consent** Yes

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COMPARISON OF CLINICAL CHARACTERISTICS BETWEEN INTERSTITIAL CYSTITIS AND HYPERSENSITIVE BLADDER

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HYPOTHESIS / AIMS OF STUDY

Interstitial cystitis (IC) and hypersensitive bladder (HSB) have a common lower urinary tract symptom profile called as hypersensitive bladder symptoms, such as bladder pain/discomfort, urinary urgency, or high frequency. IC and HSB are to be classified by the endoscopic presence of the Hunner lesions (Hunner type IC, HIC), presence of mucosal bleeding after distension (MBAD) and absence of the Hunner lesions (non-Hunner type IC, NHIC) or absence of both the Hunner lesions and MBAD (HSB), respectively [1]. However, it has been reported that clinical phenotyping could not segregate HIC, NHIC, and HSB due to the similar symptomatic profiles [2]. The aim of this study was to compare the clinical manifestations of patients with HIC, NHIC and HSB.

STUDY DESIGN, MATERIALS AND METHODS

Clinical records of female patients with IC or HSB who underwent the hydrodistension at our institution from December, 2008 to December, 2017 were retrospectively reviewed. Age, comorbidity, bladder capacity at hydrodistension, symptom severity before and after hydrodistension measured by O'Leary–Sant's symptom and problem indexes (OSSI and

OSPI), and the visual analog scale (VAS) for pain were compared among HIC, NHIC, and HSB.

RESULTS

A total of 134 female patients with HIC (N=87), NHIC (N=33) and HSB (N=14) were evaluated. Patients with HIC were oldest and significantly older than those with NHIC. Patients with HIC had significantly higher OSSI than those with HSB, and smaller bladder capacity at hydrodistension than those with NHIC or HSB. The global response rate to hydrodistension (with or without fulguration) was highest in patients with HIC (89%), followed by those with HSB (57%) and NHIC (44%) (Table 1). Regarding comorbidities, diabetes mellitus and psychiatric disorders, respectively, were significantly more frequent in patients with HIC and in those with NHIC than the other two (Table 2).

INTERPRETATION OF RESULTS

Patients with HIC were more aged and symptomatic, and showed better responses to hydrodistension compared to those with NHIC or HSB. There were almost no clinical parameters different between NHIC and HSB.

CONCLUDING MESSAGE

Clinical characters were distinct in HIC, while indistinguishable between NHIC and HSB.

FIGURE 1

Clinical parameters	HIC (N=53)	NHIC (N=27)	HSB (N=14)
Age	67.6###	53.1###	63.8
OSSI	13.5*	12.0	10.6*
OSPI	11.9	10.8	9.31
VAS	7.2	6.8	5.8
Bladder capacity at hydrodistension (ml)	467***, ###	679###	786***
Global response rate to hydrodistension	0.89**, ###	0.44###	0.57**

Table1. Comparison of clinical parameters among treatment-naïve patients with Hunner type IC (HIC), non-Hunner type IC (NHIC), and hypersensitive bladder (HSB)
###p<0.001, HIC vs. NHIC
; * p<0.05, ** p<0.01, *** p<0.001, HIC vs. HSB by Tukey-Kramer's test

FIGURE 2

Comorbidities	HIC (N=87)	NHIC (N=33)	HSB (N=14)	p
Diabetes mellitus	10	0	1	0.036
Psychiatric disorders	2	5	0	0.020
Spinal disease	5	2	4	0.051
History of pelvic surgery	22	11	3	0.605
Endometriosis	3	4	2	0.133
Collagen disease	15	3	0	0.060
Sjögren syndrome	7	2	0	0.333
Rheumatoid arthritis	2	0	0	0.418
Irritable bowel syndrome	0	1	0	0.243

Table 2. Comparison of the frequency of comorbidities among Hunner type IC (HIC), non-Hunner type IC (NHIC), and hypersensitive bladder (HSB) by nominal logistic regression analysis

REFERENCES

1. Homma Y, Ueda T, Tomoe H, et al. Clinical guidelines for interstitial cystitis and hypersensitive bladder updated in 2015. Int J Urol 2016; 23: 542-549
2. Homma Y. Hypersensitive bladder: A solution to confused terminology and ignorance concerning interstitial cystitis. Int J Urol 2014; 21 (suppl 1): 43-47

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EVALUATION OF THE INCIDENCE AND RISK FACTORS ASSOCIATED WITH VESICOURETERAL REFLUX IN PATIENTS WITH ULCERATIVE BLADDER PAIN SYNDROME/ INTERSTITIAL CYSTITIS

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HYPOTHESIS / AIMS OF STUDY

The purpose of this study is to investigate the incidence and risk factors associated with vesicoureteral reflux (VUR) in patients with ulcerative bladder pain syndrome/Interstitial Cystitis (BPS/IC).

STUDY DESIGN, MATERIALS AND METHODS

We evaluated 211 patients with BPS/IC who underwent cystoscopy and confirmed the presence of Hunner's ulcer from May 2011 to July 2017 retrospectively. Among these patients, 113 patients whose functional bladder capacity was 300cc or less according to the voiding diary were included in this study. All patients were evaluated by voiding cystourethrography (VCUG) to check for the presence of bladder destruction and VUR. Patients were classified into two groups according to presence of VUR and the risk factors for VUR include the locations and numbers of Hunner's ulcer, functional bladder capacity, maximal flow rate (Qmax), post voiding residual urine volume (PVR), the degrees and duration of the pain were assessed using univariate and multivariate logistic regression analysis.

RESULTS

Of 113 patients, the mean bladder capacity was 205.3±77.9cc and 28 patients were confirmed VUR by VCUG (28/113, 24.8%). The maximum functional bladder capacity of patients with VUR was significant lower than patients without VUR (156.8±72.8cc vs. 221.2±73.2cc, $p<0.05$) and it affects the presence of VUR in univariate analysis. In addition to functional bladder capacity, the location of Hunner's ulcer

especially in peri-ureteral location was also significant risk factor whereas other parameters such as numbers of ulcer, degrees of pain, duration of symptoms, Qmax and PVR did not affect the presence of VUR in ulcerative BPS/IC. In multivariate logistic regression analysis, the peri-ureterally location of Hunner's ulcer was the only independent risk factor for presence of VUR in ulcerative BPS/IC (OR, 3.506; 95% CI, 2.380 to 5.164; p<0.001) (Fig. 1).

INTERPRETATION OF RESULTS

A well-known major complication of chronic IC is VUR. The currently understood pathophysiology of VUR is that if appropriate measures are not undertaken in patients with severe IC, serious bladder contraction develops, resulting in a decreased bladder capacity and eventual VUR. Reflux of urine exposes the renal parenchyma to higher than-normal hydrostatic pressures. In addition, ascending infection from the bladder is a cause of kidney infection. Untreated and prolonged urinary tract infection can eventually lead to renal scarring, also known as reflux nephropathy. Renal scarring, which is characterized by permanent damage to the renal parenchyma, can lead to high blood pressure and renal failure, for which dialysis or kidney transplantation may be necessary.

However, in clinical practice, not all patients with IC and a decreased bladder capacity have VUR. Moreover, the severity of the decreased bladder capacity does not necessarily correlate with the severity of VUR. Thus, we speculated that the development of VUR in patients with IC must be due to a variety of interrelated factors. In this study, we assumed that commonly found Hunner lesions, when located close enough, may cause ureteral orifice malfunction, thereby acting as another pathologic factor leading to ipsilateral VUR.

In our study, the peri-ureterally location of Hunner's ulcer had major responsibility to the presence of VUR. It showed that among the various factors that may affect the bladder dysfunction in patients with BPS/IC, the presence and location of Hunner's ulcer is one of the most important factor that urologists have to consider in the management of the patients with BPS/IC.

CONCLUDING MESSAGE

VUR is not an uncommon complication in patients with IC. In addition,the development of VUR in patients with IC is probably due to multiple variable factors but the presence of periureterally located Hunner lesions is likely to be an important factor in the development of ipsilateral VUR.

The incidence of VUR in patients with ulcerative BPS/IC is relatively high and the urologist has to consider the presence of VUR in the management of the patients with ulcerative BPS/IC especially when confirmed peri-uretrally located Hunner's ulcer.

FIGURE 1

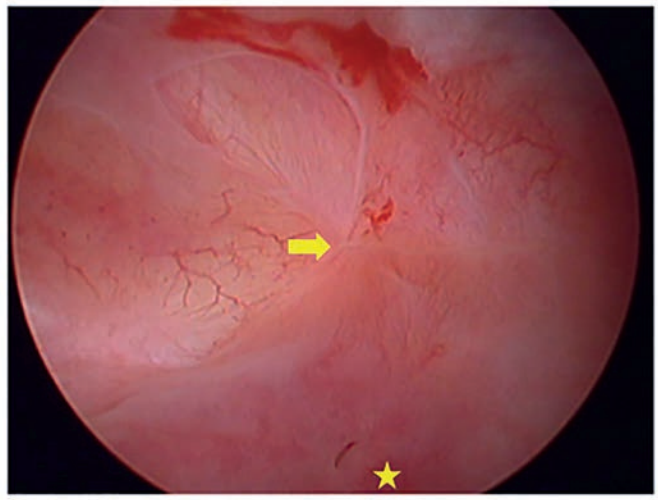

Fig 1.
Peri ureterally located Hunner's ulcer

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** IRB of Hallym University Scared Heart hospital **Helsinki** Yes **Informed Consent** No

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THE ASSOCIATION OF VULVODYNIA AND UROLOGICAL URGENCY AND FREQUENCY: FINDINGS FROM A COMMUNITY-BASED STUDY

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HYPOTHESIS / AIMS OF STUDY

A recent study suggested that by age 40, 8% of women will experience vulvar pain on contact for a period of at least 3 months that limits or prevents sexual intercourse. When clinically confirmed, it is defined as debilitating vulvar discomfort due to burning pain or pain on contact that occurs in the absence of clinically visible pathological findings or identifiable disorders. We and others have shown that women who suffer from vulvodynia are more likely than others to experience co-morbid interstitial cystitis and urinary tract infections. However, no studies to our knowledge have assessed whether women with vulvodynia suffer from other lower urinary tract symptoms (LUTS) in the absence of Interstitial Cystitis and urinary tract infection (UTI) history. We sought to determine whether women with and without vulvodynia differed in their self-reported history of daytime and nighttime urination frequency, urgency after urination, and severity and bother associated with urgency experiences. This data comes from a community-based case-control study of women with clinically confirmed vulvodynia and communi-

ty matched controls conducted in the metropolitan area of Minneapolis and Saint Paul, Minnesota.

STUDY DESIGN, MATERIALS AND METHODS

Women 18-40 years of age who were part of the administrative database of a large health care network that represents approximately 27% of the population in the Minneapolis/St. Paul metropolitan area, were initially recruited through self-administered surveys to examine the prevalence of vulvar pain. Women seen for any reason in one of over 40 community health clinics within a two-year window between March, 2010, and October, 2013 were assessed for eligibility. Women likely to meet the International Society for the Study of Vulvovaginal Diseases (ISSVD) criteria for vulvodynia based on their initial survey responses were invited to participate in a clinical visit to confirm the diagnosis. Of the 1,398 women invited, 350 completed their examination and 234 were clinically confirmed as meeting the diagnostic criteria for vulvodynia. Women from this same pool of screened women with no history of vulvar discomfort were randomly selected and invited to serve as controls. Of 2,287 women invited, 251 agreed and 234 were clinically confirmed as having no ongoing or past history of vulvar pain. All cases and controls completed a background and medical history questionnaire by telephone that covered demographic characteristics, sexual and reproductive history, and personal hygiene practices. We specifically asked women to estimate how many times per day and per night they go to the bathroom, whether they have urgency after going to the bathroom, and if so, the severity and bother associated with that urgency. With a sample size of 234 cases and 234 controls, our study had 80% power to detect odds ratios ranging from1.72 to 2.13 for prevalence of urinary symptoms with 10 and 30 percent prevalence using two-sided tests and an α-level of 0.05. As shown in the Table below, the prevalence of any urgency after urination among controls was 18% and any bothersome nocturnal voiding was 32%.

RESULTS

Women with any history of interstitial cystitis were excluded from this analysis. We observed no major difference in the frequency of urination during the day among women with and without vulvodynia. However, women with vulvodynia were 70% more likely to urinate 2 or more times at night compared to controls, after adjustment for age, use of sleeping medications, smoking history, anxiety, and history of urinary tract infections (95%CI 0.9-3.3). Among those who reported getting up at night to urinate, women with vulvodynia were 3.5 times more likely to report bother associated with nighttime voiding compared to controls (95%CI 1.7-7.2) after the same multivariate adjustments. Women with vulvodynia, compared to controls, were also 5 times more likely to report having any urgency after going to the bathroom (95%CI 1.4-17.4) and were 19 times more likely to report moderate to severe urgency after urination compared to controls (95%CI 5.5-64.1), again after adjustment for the same covariates listed above.

INTERPRETATION OF RESULTS

Our findings suggest that even after accounting for interstitial cystitis and history of urinary tract infections, women with vulvodynia were significantly more likely to experience urgency after urination that was bothersome and considered moderate to severe.

CONCLUDING MESSAGE

Findings from this community based study suggests that lower urinary tract symptoms (LUTS) are much more prevalent among women with vulvodynia compared to comparable population controls. This finding suggests further research is need to better understand why vulvar pain elicits benign urological symptoms and whether women with vulvodynia should be managed by clinicians with experience in both gynecology and urology.

FIGURE 1

Table: Association between vulvodynia and a) bother associated with nocturnal voiding, and b) severity of urgency after voiding

Selected urological symptoms	Cases *(N=211)* N (%)	Controls *(N=226)* N (%)	OR (95%CI)*
No nocturnal voiding	68 (32.2)	88 (38.9)	1.0
Nocturnal voiding – no bother	35 (16.6)	65 (28.8)	0.7 (0.4-1.3)
Nocturnal voiding – occasional bother	64 (30.3)	55 (24.3)	1.6 (1.0-2.7)
Nocturnal voiding – usually/always bother	44 (20.9)	18 (8.0)	2.4 (1.2-4.7)
No urgency after voiding	93 (44.1)	186 (82.5)	1.0
Mild urgency after voiding	80 (37.9)	37 (16.4)	3.8 (2.3-6.2)
Moderate to severe urgency after voiding	38 (18.0)	3 (1.3)	18.7 (5.5-64.1)

** All models adjusted for current age, sleeping medication, smoking status, history of anxiety and UTI infection prior to first onset of vulvar pain or comparable age among controls.*

Funding This research was supported by NIH-NICHD R01-HD058608 **Clinical Trial** No **Subjects** Human **Ethics Committee** Institutional Review Boards at the University of Minnesota and Boston University Medical Center **Helsinki** Yes **Informed Consent** Yes

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EFFICACY, COMPLICATIONS AND TOLERABILITY OF REPEATED INTRAVESICAL ONABOTULINUMTOXINA INJECTIONS IN INTERSTITIAL CYSTITIS/BLADDER PAIN SYNDROME

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HYPOTHESIS / AIMS OF STUDY

Chronic bladder pain is the hallmark of interstitial cystitis/bladder pain syndrome (IC/BPS), which is a debilitating disease. IC/BPS symptoms result in poor quality of life with sleep dysfunction, depression, anxiety and stress . Repeated intravasical OnabotulinumtoxinA injections was studied and found to decreases the expression of vascular endothelial growth factor which play an important role in the pathogenesis of IC/BPS. To our knowledge , there is no study that

looked at the local experience in Saudi Arabia. We aim to evaluate the outcome, safety, complications and patient's tolerability of repeated intravesical OnabotulinumtoxinA (BOTOX) injection for interstitial cystitis/bladder pain syndrome in one center in Saudi Arabia

STUDY DESIGN, MATERIALS AND METHODS
Retrospectively we reviewed medical charts of 26 adult patients (4 males and 22 females with mean age of 40.9 years) who underwent BOTOX injections for painful bladder syndrome from March 2010 to June 2017 in a single tertiary care center. Intravesical BOTOX injections of 100, 150 or 200 units were given depending on patient's condition and side effects risk.

Preoperative data (demographic data ,medical history , comorbidities and body mass index), Intraoperative data (Operation time , Botox dose, injection sites, ulcerations number, and intraoperative complications) and Pre, same day post-operative and 4 months post treatment pain score via visual analogue score (VAS) were collected from the files. The procedure is performed as a day case activity under general anesthesia. The outcome was determined at 4 months post BOTOX injection treatment via clinic visit interview about improvement of pain and following changes in bladder ulceration during future cystoscopies. Patient's satisfaction rate was assessed through a short survey: fully satisfied, partially satisfied (50% or more) or not satisfied, if patient will repeat the injections, and if patient will recommend this therapy to other patients.

RESULTS
26 charts were reviewed. All patients underwent total of 114 procedures. 23/26(88.46%) patients underwent repeated procedures (at least twice) with a mean of 5.15 procedures /patient and mean of 10.64 months between repeated procedures . Mean operative time was 7.2 minutes. 30.77% of the patients (8) were morbid obese, 7.7 %(2) had diabetes mellitus, 11.54 %(3) had Hypertension.

50 %(13) of the patients received 200 units of BOTOX, 23 %(6) received 100 units and 27 %(7) received 150 units. Adjustment of BOTOX dose was performed in 10 patients (3 patients had their doses increased for more control and 7 patients were reduced the dose to minimize voiding difficulties.

INTERPRETATION OF RESULTS
The pain score via visual analogue score dropped to 0.62 after the procedure from 8.7 at the time of the diagnosis of IC/PBS. 5/26 patients with classic bladder wall ulcerations. 3/5 had complete resolutions of the bladder wall ulcers after two repeated BOTOX intravesical injections. 2/5 had significant improvement (more than 50%) of the ulcers.

There was no major intraoperative or postoperative complications. Postoperative urinary retention was observed in 3 patients and they were managed by clean intermittent catheterization. Other 3 patients had urinary tract infection and treated with oral antibiotics and did not required admission.

16/23 (69.6%) were fully satisfied and 7/23 (30.4%) were partially satisfied. 88.46% of all patients would repeat the treatment and 77% would recommend the treatment to other patient.

CONCLUDING MESSAGE
Repeated intravesical BOTOX injection is an effective, well tolerated and safe treatment modality for patients with IC/PBS. It has a very good outcome in controlling the disease pain symptom and treating bladder wall ulcers.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** King Khaled Medical City IRB **Helsinki** Yes

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THE ROLE OF VACCINES IN THE PROPHYLAXIS OF RECURRENT UNCOMPLICATED URINARY TRACT INFECTIONS IN ADULT PATIENTS: A SYSTEMATIC REVIEW

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HYPOTHESIS / AIMS OF STUDY
With increasing concerns over the rise of antibiotic resistance, there has been great interest in developing non-antibiotic prophylactic strategies for recurrent urinary tract infections (RUTIs). There has been a rise in the number of randomised controlled trials (RCTs) evaluating the clinical efficacy and safety of both new and existing vaccines for UTI prophylaxis in recent years. The aim of this systematic review was to evaluate all available evidence from RCTs on the effectiveness, tolerability and safety of vaccines for the prophylaxis of recurrent uncomplicated UTIs in adults.

STUDY DESIGN, MATERIALS AND METHODS
We carried out a systematic literature search in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines in the CENTRAL (Cochrane Central Register of Controlled Trials), EMBASE and MEDLINE (PubMed®) databases from inception to 21st October 2017.

For the construction of the search strategy, the following descriptors and their respective synonyms were used: urinary tract infection, vaccination and the names of vaccines currently in use (Uro-Vaxom®, Uromune®, and Solco-Urovac®). Abstracts from conferences or clinical trial registries were not considered. No publication year restrictions were enforced. Only articles in the English language were included in the analysis.

Two independent reviewers searched for and included randomized controlled trials that compared the prevention of uncomplicated UTIs in adult patients (≥18yrs) using vaccines/immunostimulants (intervention group) with placebo or non-placebo controls (control group). Data extraction and quality assessment was performed independently by two reviewers using a pre-designed data extraction form.

The primary outcome measure was the mean frequency of UTI recurrences. Adverse events (AEs) were assessed as a secondary outcome. Risk of bias was performed using the Jadad scale. Due to heterogeneity in the outcome reporting between studies, a narrative review of the results for each study was performed.

RESULTS

We identified 3153 records and included nine RCTs that met the eligibility criteria. Of these, five studied Uro-Vaxom®/OM-89 (sample size 955, median Jadad score 3) three studied Solco-Urovac® (sample size 220, median Jadad score 2) and one studied ExPEC4V (sample size 194, Jadad score 4).

All studies evaluating Uro-Vaxom®/OM-89 demonstrated a significant reduction in the incidence of UTIs when compared with placebo. The largest study to date evaluating the medium-term therapeutic efficacy of Uro-Vaxom® over a 12-month follow-up demonstrated the mean rate of recurrence to be significantly lower in the treatment group than in the placebo group (0.84 vs. 1.28; p=0.0026) (1).

Solco-Urovac® was also able to significantly reduce UTI recurrence and prolonged the time to re-infection. However, in one study this was only achieved after a booster cycle of the vaccine was administered to the patients a few months after the primary immunisation (2).

Interestingly, no significant reductions were observed in the mean number of UTIs caused by vaccine-specific serotypes in ExPEC4V-treated patients when compared with placebo. However, significantly fewer UTIs caused by E. coli of any serotype were reported in the treatment group compared with placebo (0.414 mean recurrences vs 0.610 mean recurrences per patient respectively; p=0.038) (3).

All three immunostimulants had a good safety profile with no severe treatment-related AEs being reported.

INTERPRETATION OF RESULTS

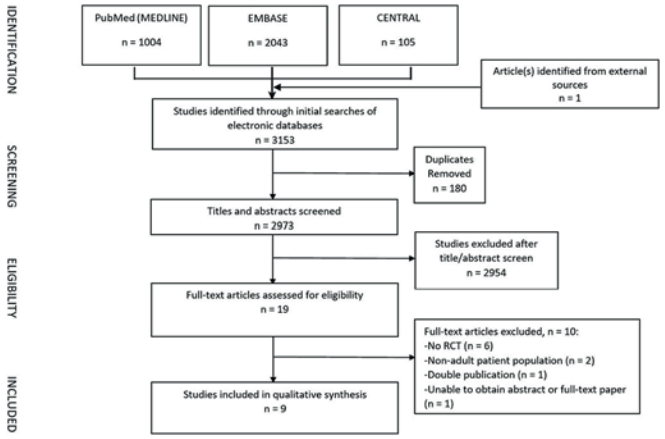
The current evidence suggests that there is therapeutic benefit in the use of Uro-Vaxom®, Solco-Urovac® and ExPEC4V as safe prophylactic agents against RUTIs in adult patients. However, the studies were heterogeneous with short-term follow-up periods.

The findings of this systematic review were limited by the lack of high quality RCTs, inconsistent definitions of UTI, heterogeneous measures of outcome between studies, the limited number of studies evaluating each vaccine and the exclusion of potentially relevant studies due to the search criteria and methodology employed.

CONCLUDING MESSAGE

The therapeutic benefits of vaccines for uncomplicated UTI prophylaxis seem promising but larger-scale, longer-term and higher-quality trials that use uniform outcomes and definitions are warranted to better compare alternatives and draw conclusions in future.

FIGURE 1



REFERENCES

1. Bauer H.W., Alloussi S., Egger G., Blumlein H.M., Cozma G., Schulman CC. A long-term, multicenter, double-blind study of an Echerichia coli extract (OM-89) in female patients with recurrent urinary tract infections. Eur Urol 2005 April 2005;47(4):542-548.
2. Uehling D.T., Hopkins W.J., Elkahwaji J.E., Schmidt D.M., Leverson GE. Phase 2 clinical trial of a vaginal mucosal vaccine for urinary tract infections. J Urol 2003 01 Sep 2003;170(3):867-869.
3. Huttner A, Hatz C, Dobbelsteen G, Abbanat D, Hornacek A, Frolich R, et al. Safety, immunogenicity, and preliminary clinical efficacy of a vaccine against extraintestinal pathogenic Escherichia coli in women with a history of recurrent urinary tract infection: a randomised, single-blind, placebo-controlled phase 1b trial. Lancet infectious diseases 2017;(no pagination).

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** This study was not a trial. It was a systematic review of the current literature. **Helsinki** Yes **Informed Consent** Yes

618 www.ics.org/2018/abstract/618

INFLUENCE OF REGULAR EXERCISE ON RISK FACTORS OF METABOLIC SYNDROME AND OAB PREVENTION IN WOMEN

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HYPOTHESIS / AIMS OF STUDY

Lower urinary tract symptom (LUTS) is a common health-related problem in women of all ages. Recently, there were reports to demonstrate the association of metabolic syndrome (MetS) and LUTS in women. Moreover, some studies showed that obesity which is a risk factor of MetS may contribute to develop OAB in women. However, a study noted that there was no improvement of OAB symptoms after weigh reduction. Thus, further study is necessary to define the influence of MetS and life style modification such as exercise on OAB. Therefore, we studied the influence of daily exercise on risk factors of MetS and OAB associated LUTS in women who took regular health checkups.

STUDY DESIGN, MATERIALS AND METHODS

A medical record of 1768 women who visited in the health promotion center was reviewed. They completed the questions about degree of exercise and LUTS from the health questionnaire. The questions about LUTS were composed of 5 inquiries about frequency, urgency, urge incontinence, nocturia and stress urinary incontinence (SUI). Laboratory studies with fasting blood sugar (FBS), hemoglobin A1c (HbA1c), triglyceride (TG), high-density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL) were done.

RESULTS

Mean age of 1768 women was 43.1 (18 - 87) years old. Mean body mass index (BMI) and waist circumference (WC) were 21.6 (15.2 – 47.3) cm2/kg and 79.1 (51.7 – 137.8) cm. Mean FBS, HbA1c, TC, TG, HDL and LDL were 90.3±16.6 mg/dL, 5.3±0.5, 186.2±32.6 mg/dL, 77.3±47.9 mg/dL, 59.6±13.3 mg/dL, and 106.5±28.9 mg/dL, respectively. The most common LUTS was frequency (59.1%, 1045/1768) and the next was nocturia (41.9%, 741/17687) and SUI (39.9%, 706/1768). Of the 1768 women, 55 (978/1768) % performed regular exercise and 44.7 (790/1768) % did not perform any exercise. From the women doing regular exercise, 33.6 (329/978) % performed at least 150 minutes of moderate aerobic activity. Women doing regular exercise showed significantly lower LDL compared with women who did not regular exercise. The prevalence of frequency, UI, and SUI was significantly higher in women who did not regular exercise compared to the women doing regular exercise. From the women doing regular exercise, BMI and TG of the women performing at least 150 minutes of moderate aerobic activity were significantly lower than women who did not regular exercise. However, significant difference in the prevalence of LUTS was not noted according to the amount of daily exercise.

INTERPRETATION OF RESULTS

Frequency was the most commonly noted LUTS. About half of the women included in this study exercised regularly. Regular exercise could contribute to prevent MetS by decreasing risk factors such as LDL. Moreover, regular exercise prevented the development of OAB symptoms and SUI regardless of the degree of exercise.

CONCLUDING MESSAGE

Regular exercise regardless of the intensity reduces risk factors of MetS and has a preventive effect on the development of OAB and SUI in women.

REFERENCES

1. Int J Clin Pract 2015;69:199-217.
2. J Urol 2018;199:215-222.

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Catholic University of Korea **Helsinki** Yes **Informed Consent** Yes

619 www.ics.org/2018/abstract/619

URINARY TRACT INFECTION STILL A CHALLENGE TO FIGHT: A REAL SETTING STUDY

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HYPOTHESIS / AIMS OF STUDY

Urinary tract infections (UTIs) both in males and females represent one of the major cause of urological consultation in our clinical practice. Urinary tract infections are subclassified into complicated and uncomplicated UTI. Complicated UTI implies that the urinary tract has a functional or structural abnormality but the term also includes all upper UTI and all UTI in men.Many of patients were previously treated by general practitioners or other specialists. Patients suffering from a symptomatic UTI are commonly treated with antibiotics;

these treatments can result in long-term alteration of the normal micro-biota of the vagina and gastrointestinal tract and in the development of multidrug-resistant microorganisms. The asymptomatic bacteriuria (ABU) is also prevalent, and often misdiagnosed as UTI leading to inappropriate antimicrobial use . Antibiotic overuse has several adverse effects, including the emergence of multidrug resistant organisms, adverse drug reactions, Clostridium difficile infection, and increased costs of health care

Aim of this study is to make a picture of these outpatients in the real life setting

STUDY DESIGN, MATERIALS AND METHODS

This is a multicenter prospective study, approved by the local ethics committee. We included male and female patients (age 18-75 years) who attended the outpatient urological clinic with signs and/or symptoms of acute uncomplicated cystitis, or recurrent uncomplicated cystitis ,or complicated cystitis . We excluded patients with bacterial prostatitis, pyelonephritis, sepsis, or SIRS. All patients were entered into an electronic database that included demographic and general clinical information, microbiological characteristics, previous antimicrobial therapies used and antimicrobial susceptibility patterns. The Mann-Whitney test was used to compare ordinal and non-normally distributed continuous variables. Categorical data were analysed by the X2 test with Yate's correction or Fisher's exact test. Statistical analyses were performed using IBM-SPSS® version 23.0 (IBM Corp., Armonk, NY, USA, 2015). A two-sided p-value <0.05 was considered significant.

RESULTS

From July 2017 to October 2017, 353 patients were enrolled. Of these, 232 were women (138 acute uncomplicated cystitis, of which 107 recurrent uncomplicated cystitis and 35 complicated cystitis) with mean age 51.8±17.3 years; 132 were postmenopausal; 49 had POP (stage II-IV);21 had chronic urinary retention; 1 had a permanent catheter; 6 were under an intermittent catheterization regimen (IC).One hundred and nine were men with a mean age of 52.4±16.9 years. Their symptoms and conditions broke down as follows: 20 had recurrent UTI, 63 had BPH of which 27 had chronic urinary retention and 4 had a permanent catheter; 9 were under IC; 8 had a permanent catheter. In 59 women (25%) and 9 (8%) men the reason for urological consultation was asymptomatic bacteriuria (AB). Furthermore, in 94 women and 24 men, a history of previous AB was referred with 67 (71%) and 15 (62%) respectively previously treated with antibiotics by the general practitioners.Two hundred seventeen patients (61.4%) had multidrug resistance (i.e. resistance to three or more antimicrobial classes). Women had higher prevalence of antimicrobial resistance compared to men (59.4% vs 40.5%) p<0.0001. Graph 1 shows the prevalence of resistance of each principal antimicrobial class.The prevalence of resistance to fluoroquinolone was higher (22%) compared to other antibiotic agents. Of patients with antimicrobial resistance, 27% and 22% had previous AB and recurrent uncomplicated cystitis respectively

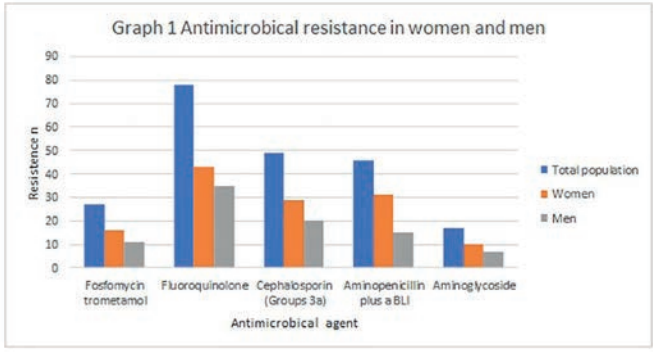
INTERPRETATION OF RESULTS

Female prevalence of UTI was higher than male prevalence. However in 59 women (25%) and 9 (8%) men the reason for urological consultation was asymptomatic bacteriuria; the general practitioners generally treat asymptomatic bacteriuria with antibiotic therapy favoring the onset of resistance; infact most patients with asymptomatic bacteriuria had a multidrug resistance, in particluar to the fluoroquinolone and to cephalosporin.

CONCLUDING MESSAGE

Our study shows that 61.4% of patients with UTI referring to a urological clinic present multiresistance antibiotic patterns. Moreover, 40.5% of the women and 22% of men continue to be inappropriately treated for asymptomatic bacteriuria. The need for an educational campaign in favor of the correct UTI treatment remains a priority for urological societies

FIGURE 1



Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** CEAS Umbria **Helsinki** Yes **Informed Consent** Yes

620 www.ics.org/2018/abstract/620

INSIGHT INTO BLADDER HEALTH: THE RELATION BETWEEN PREVALENT LOWER URINARY TRACT SYMPTOMS AND INTERFERENCE IN WOMEN IN THE BOSTON AREA COMMUNITY HEALTH SURVEY

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HYPOTHESIS / AIMS OF STUDY

Most research on lower urinary tract symptoms (LUTS) in women to date has focused on LUTS prevalence and treatment, whereas considerably less has focused on LUTS prevention and bladder health promotion. To address this gap, the Prevention of Lower Urinary Tract Symptom Research Consortium developed a framework for studying bladder health adapted from the World Health Organization definition of overall health: "A complete state of physical, mental, and social well-being related to bladder function [that] permits daily activities, adapts to short-term physical and environmental stressors, and allows optimal well-being (e.g., travel, exercise, social, occupational or other activities)." Although this framework represents a major step forward in conceptualizing bladder health, we do not yet have data to quantify and further refine this concept. Therefore, we took advantage of existing data from the Boston Area Community Health (BACH) Survey, a large population-based study of Boston residents, to explore this concept further, drawing upon its extensive collection of LUTS and rare collection of interference from LUTS with daily activities in women.

STUDY DESIGN, MATERIALS AND METHODS

At baseline, participants reported their frequency of 16 LUTS, including storage, voiding, and incontinence symptoms, and lower urinary tract pain. Information on interference from urinary experiences, pain, or discomfort in the pubic area with seven activities was also collected, using an adapted version of the validated Epstein scale. Activities assessed were drinking fluids before travel; driving for two hours without stopping; going to places that may not have a toilet; playing sports outdoors such as golf; going to movies, shows, and church; drinking fluids before bed; and getting enough sleep at night. Prevalence estimates were weighted to account for the BACH sampling design, and prevalence ratios (PRs) were calculated by log-link generalized linear models with robust variance estimation, adjusting for known LUTS risk factors and each other individual LUTS. With a sample size of 2,697 participants, our study had at least 80% power to detect minimum detectable PRs ranging 1.20-1.35 for LUTS prevalence and interference estimates between 10 to 50%, and using two-sided tests and an α-level of 0.05.

RESULTS

2,697 women >30 years of age completed the BACH baseline visit and provided complete data. Of these women, 19.7% reported no LUTS or interference, whereas 48.1% reported LUTS at least rarely but no interference (see Table). Within the latter group, the breakdown of LUTS frequency was 13.7% for LUTS at least rarely, 15.0% for a few times, 7.9% for fairly often, and 11.4% for usually or almost always in the past month. Few women (2.2%) reported no LUTS but at least a little interference, and 30.0% reported some degree of both LUTS and interference. LUTS independently associated with interference were urgency incontinence (PR=1.4, 95% CI: 1.1-1.8), urgency (PR=1.3, 95% CI: 1.1-1.6), nocturia (PR=1.4, 95% CI: 1.1-1.7), perceived frequency (PR=1.5, 95% CI: 1.2-1.9), and weak stream (PR=1.2, 95% CI 1.0-1.5).

INTERPRETATION OF RESULTS

Our findings suggest that as few as one in five women could be considered to have optimal bladder health (no LUTS or interference), half of women could be considered to have intermediate health (some degree of LUTS or interference), and one third could be considered to have worse health (some degree of both LUTS and interference). Storage LUTS and weak stream contributed independently to interference in this population.

CONCLUDING MESSAGE

Findings from our large secondary analysis of BACH survey data begin to inform and quantify the spectrum of bladder health, demonstrating that only one in five women might be considered to have optimal bladder health, whereas the remaining 80% of women fall somewhere on the spectrum between intermediate and worse bladder health. This large percentage of symptomatic women highlights opportunities for both LUTS prevention and bladder health promotion.

FIGURE 1

Table: Joint distribution of prevalent LUTS and interference.

		Frequency of interference (%)				
		None of the time	A little of the time	Some of the time	Most of the time	All of the time
Frequency of LUTS	No symptoms	19.7	1.2	0.7	0.3	0.0
	Rarely	13.7	1.3	0.6	0.0	0.3
	A few times	15.0	4.4	2.6	0.7	0.8
	Fairly often	7.9	2.8	2.4	1.2	0.8
	Usually	4.5	1.4	1.7	0.8	0.5
	Almost always	6.9	1.1	1.1	2.0	3.2

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621 www.ics.org/2018/abstract/621

THE CURRENT STATE OF CONTINENCE IN CANADA: A POPULATION REPRESENTATIVE EPIDEMIOLOGICAL SURVEY.

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HYPOTHESIS / AIMS OF STUDY

Epidemiological data on the prevalence of lower urinary tract symptoms and urinary incontinence in Canada are dated [1]. Demographic change suggests that the prevalence of these conditions will rise over time as a greater proportion of the Canadian population survives into later life. Urinary incontinence is associated with significant effects on quality of life, employment and social well-being notwithstanding the impact on healthcare resource use.

Awareness of and access to healthcare services for these conditions varies across the country and, anecdotally, many sufferers report significant barriers to healthcare. This study aimed to describe, in a nationally representative sample, the prevalence of lower urinary tract symptoms and urinary incontinence and to assess the current state of knowledge of these conditions, the treatment for them and the treatment experience of symptomatic persons.

STUDY DESIGN, MATERIALS AND METHODS

A nationally representative adult (18 years and above) sample (age, region, sex) of 1000 people were surveyed by random digit dialling during May 2017. A 20 minute questionnaire based upon the previous EPIC [2] survey with additional questions on awareness, access, barriers to care, stigma and healthcare experience was administered. Resulting data were coded, entered into a database and analysed using SPSS v25 (IBM,Cary, Ind.). Descriptive statistics were used to illustrate the data, comparisons were made using parametric or non-parametric statistics according to the underlying distribution of the data. The margin of error associated with a probability based sample of 1,000 is +/-3.1%, 19 times out of 20.

RESULTS

Of the 1000 people contacted, 52% were female, 64% married or living with a partner and 17 % single, divorced or widow(er)ed. 78% of all respondents were either aware or vaguely aware of the term "incontinence" (84% women 72% men); 48% understood this as an "inability to hold one's bladder" and 27% as involuntary urine leakage. Respondents felt incontinence to be a common problem affecting 30% of Canadians, this estimate increased with age of the respondent and was higher when estimated by women. 44% of respondents felt that incontinence was a serious problem that could easily ruin quality of life, 37% felt that incontinence was a problem that could be medically managed; only 11% felt that incontinence was an inconvenience. When asked, 94% of respondents felt that people with incontinence should seek medical advice, but only 41% knew what help was available or what could be done for symptoms. There was a marked sex difference, with only 27% of men aware compared to 54% of women. When asked about incontinence as a taboo subject, respondents indicated that they would find incontinence easier to talk about than either body odour (37%v37%), reduced libido (49%v25%) or a sexually transmitted disease (51%v23%). People under the age of 45 would be less likely to discuss incontinence than depression (31v43%).

Of the total sample, 12.7% had a diagnosis of coexistent diabetes mellitus, 14.9% depression, chronic cough 10.6%, chronic constipation 7.6%, asthma 12.0%, 21.1% hypertension 2.9% associated neurological conditions and 3.1% of the men had a diagnosis of benign prostatic enlargement and prostate cancer. 21.0% of the sample had urinary incontinence. The distribution of incontinence subtypes and bothersome LUTS and treatments used is shown in table 1. Of the respondents with incontinence, 126 (41.0%) experienced leakage a few times a week or more frequently. 24% of sufferers had had their incontinence for more than 11 years. 4.0% of respondents reported accidental bowel leakage over the previous four weeks. Figure 1 shows the impact of incontinence on quality of life domains. 49% of people with UI had initiated a discussion with their healthcare provider about their urinary symptoms, 51% within the last year. Of those who had discussed their problem, 61% had discussed their problems with a doctor. Of the 41 respondents taking prescription medications for their bladder problem, only 10 felt that they were working well; 29 were taking their medication for over a year.

INTERPRETATION OF RESULTS

These data give an impression of the current prevalence and effects of urinary incontinence in the general Canadian population. The current distribution of UI and subtypes is similar to that found in 2006. There remains a lack of awareness of the available treatments for the condition despite an acknowledgement that UI is an important medical condition.

Few people with UI have actively engaged with treatments. Men remain less aware and less likely to seek healthcare advice than women. Incontinence did not seem to be such a great taboo as is often thought; this opens up opportunities to further the social discussion of the problem in Canada. These data will form the backbone of a Canadian Continence Foundation national awareness campaign.

CONCLUDING MESSAGE

UI in Canada remains a common and troublesome condition for which there continues to be only limited awareness of treatments. A planned awareness campaign will address this problem

FIGURE 1

Symptom	%,yes (N=1000)
Urinary urgency	15.8
Urgency incontinence	7.8
Leakage on exertion	16.6
Over the past 4 weeks, how bothered have you been by...	**Somewhat or more % (n=259)**
Urinary urgency	28.5
Daytime urinary frequency	35.5
Nocturia	44.7
Urgency urinary incontinence	27.8
Urine loss on physical exertion	31.6
What treatments had people undertaken?	
Fluid restriction	17.8
Use of pelvic floor muscle therapy of any type	22.0
Use of containment products	40.9
Use of non-prescription medications or supplements	10.0
Use of prescription medications	15.8
Surgery	9.3

Table 1. Symptoms and treatments

FIGURE 2

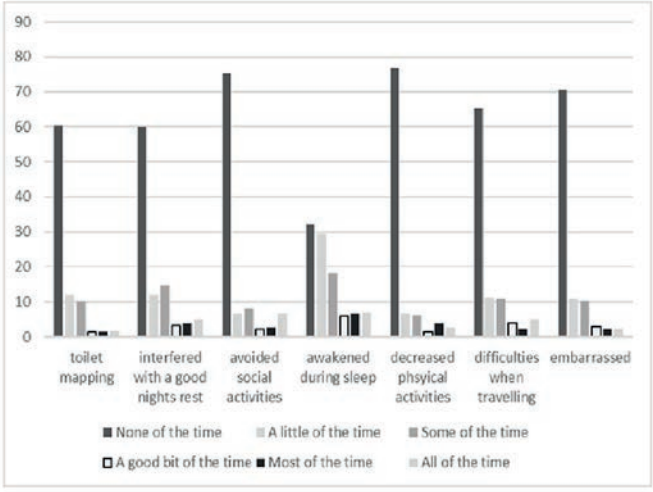

Figure 1.Reported impact on QoL

REFERENCES

1. BJU Int. 2008 Jan;101(1):52-8.
2. Eur Urol 2006;50(6):1306-14

Funding Unrestricted grants provided to the Canadian Continence Foundation and Muhlenfeld Family Trust Fund **Clinical Trial** No **Subjects** Human **Ethics Committee** University of Alberta Health research Ethics Board **Helsinki** Yes **Informed Consent** Yes

622 www.ics.org/2018/abstract/622

WHAT DO WOMEN WANT AND WHY? VALUES BEHIND PREFERRED FORMATS FOR CONTINENCE PROMOTION INTERVENTIONS

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HYPOTHESIS / AIMS OF STUDY

Community-based behavioral interventions improve continence but often have low attendance. We aimed to understand the values that inform women's preferences for 3 potential intervention formats.

STUDY DESIGN, MATERIALS AND METHODS

We invited women age >50 years with urinary (UI) and/or fecal incontinence (FI), identified via the 2016 population-based Survey of the Health of Wisconsin (SHOW)(1), to participate in a 30-minute semi-structured phone interview. We mailed interview questions along with a description of 3 intervention formats, all assumed to be equally effective: (a) small-group 3-session workshop series; (b) single in-person lecture; (c) online program. Women described how and why they ranked each format in phone interviews. Verbatim transcripts were analyzed with grounded theory, a systematic, iterative inductive method.

RESULTS

Among 243 women in SHOW with UI or FI, 41 women were mailed invitational letters for this qualitative study; 31 were reached by phone and 23 (56%) participated. Median age was 67 (51-93 years); 21 (91%) were non-Hispanic White; 10 (43%) were college-educated. Twelve (52%) had UI & FI; 10 (43%) had UI only; 1 (4%) had FI only. When asked about usual sources for health information, 15 (65%) used the internet, 11 (48%) print materials, 8 (35%) healthcare providers, and 5 (22%) television; 17 (74%) had participated in other health education interventions. Intervention format preferences are outlined in Table 1. Additional participant quotes describing potential benefits and drawbacks of each format are outlined in Table 2.

Those who preferred an online format were younger and less bothered by symptoms. They valued information over skill-building, convenience over accountability, privacy over community, and self-directed over guided learning. "I'm extremely private…I could do it on my own time… and study what needs to be done…The only drawback would be the motivation to sit down and do it." Barriers were lack of internet access or skills, accountability and personal touch.

Those who preferred the workshop series were motivated by high symptom distress and a desire for skill-building and social interaction. They valued accountability over convenience, community over privacy, and experiential over passive learning. "Hands-on is a really good way to go about teaching women how to deal with or change these things." Barriers were inconvenience, lack of privacy, stigma, and shy disposition.

Those who preferred the single lecture were older and valued auditory information and handouts, time/convenience over accountability and guided over self-directed or experiential learning. "I'd rather just do one and done, though I might get more from the workshop." Many suggested adding components of the workshop series, such as a question-and-answer or small-group breakout sessions, to the lecture.

INTERPRETATION OF RESULTS

Similar values emerged in these qualitative interviews, regardless of women's intervention format preferences. Convenience and privacy were perceived advantages of the online format and single lecture formats, whereas accountability and community were advantages of the workshop format. Symptom severity influenced women's perceptions of which format best met their needs.

CONCLUDING MESSAGE

Values that impact women's preferences for continence self-management intervention formats include convenience, privacy, accountability, community, and learning style. These values should be considered in future intervention development, adaptation, dissemination and implementation efforts.

FIGURE 1

Table 1. Preferred intervention format in SHOW overall vs. qualitative participants

Preferred Intervention Format	SHOW participants (N=243) n (%)	Qualitative study (N=23) n (%)
Small-group 3-session workshop series	10 (4)	6 (26)
Single in-person lecture	61 (26)	4 (17)
Online program	130 (56)	12 (52)
None of these	32 (14)	1 (4)

Table 2. Participant quotes describing the benefits and drawbacks of each format

Modality	Benefits	Drawbacks
Online / Computer	"If I want to do it at midnight, I can do it at midnight. [I] will work into my schedule without worrying about missing something. If I don't understand something I can go back through it again." "The [blog] comments … would be helpful to have other people realize that it's not just you." "It maintains dignity. You can do it at your own pace and you're private." "[It's] easier to ask a question that was maybe a little sensitive on the computer you know. Nobody sees you."	"Sometimes the Internet is slow and you just get frustrated. I'm not a geek so sometimes I struggle using it...You can read all you want. You still don't know if you're doing it right." "I just think maybe it might be too easy not to do, too. Not to maybe complete because you get distracted or something else comes up." "You aren't going to have the human contact and the other thing you would probably miss in that type of format is that somebody else might ask a question that you didn't think of or have." "I don't have computer access. … I am not computer savvy."
3-Session Workshop	"Bumping ideas off other individuals I think is helpful in situations like this. You would be building this database for everyone to have." "That whole accountability thing… like weight watchers and going to the gym with your buddy. We would keep each other accountable." "If you make the appointments, … it wouldn't be as easy to be like oh I'm not going to go." "I'm a fan of the story telling method … to teach women how to change these things."	"By having three different workshops it means three different times … might not always work into everyone's schedule." "I'm not comfortable speaking in front of people. I didn't take my Dale Carnegie course. I'm not a good speaker." "I'd be sitting around a table eye to eye with people, I don't know … I just don't like getting too vulnerable." "Six hours would be overkill."
Single In-person Lecture	"I could sit there and take notes, then I would still have my notes to take home with me." "One and done." "The anonymity—sitting in a big auditorium." "I'm an auditory learner so I like listening and so I can learn that way."	"I am kind of shy and quiet and when I'm around big groups of people I tend to get intimidated. I will sit there and listen but to tell my opinions I kind of shut down and feel very isolated in a big group." "I think one of the [downsides] would be, the sound system might not be working well"

REFERENCES

1. Nieto FJ, Peppard PE, Engelman CD, et al. The Survey of the Health of Wisconsin (SHOW), a novel infrastructure for population health research: rationale and methods. BMC Public Health. 2010;10:785.

Funding K12DK100022 **Clinical Trial** No **Subjects** Human **Ethics Committee** University of Wisconsin-Madison Minimal Risk Health Sciences Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

623 www.ics.org/2018/abstract/623

PELVIC FLOOR SYMPTOMS AND SKELETAL FRAGILITY IN POSTMENOPAUSAL WOMEN

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HYPOTHESIS / AIMS OF STUDY

Urinary incontinence (UI) and osteoporosis share common risk factors including advanced age. Continence is maintained by intact pelvic support consisting of pelvic floor muscles and connective tissue (most abundantly collagen) which are attached to the bony pelvis. Abnormal collagen metabolism could lead to poor pelvic floor support and function resulting in UI. Skeletal integrity depends on the quantity and quality of connective tissue influenced by extracellular matrix predominantly collagen, similar to pelvic

floor support. Thus, there may be a pathophysiologic association between UI and skeletal fragility as global alteration of the collagen metabolism. Existing data suggesting the potential association between skeletal fragility and pelvic floor disorders including UI are limited and are solely based on bone mineral density (BMD), which only measures bone quantity. Our primary aim was to characterize the association between UI and skeletal fragility defined by a combination of quantity and quality bone assessment in postmenopausal women undergoing osteoporosis evaluation. We further examined the impact of bone quantity and bone quality on pelvic floor symptoms separately, as well as the association with fecal incontinence (FI) and pelvic organ prolapse (POP).

STUDY DESIGN, MATERIALS AND METHODS

Postmenopausal women undergoing an osteoporosis evaluation from 2007 to 2010 were identified from an institutional review board approved osteoporosis database which included baseline demographic data and validated pelvic floor symptom questionnaires. The presence of UI (any UI) was defined as leakage of urine at least 2-3 times per week in the past 3 months. The types of UI, stress (SUI) urgency (UUI), or mixed UI (MUI) were defined using the 3 incontinence Questions (3IQ). FI was defined as liquid or solid stool leakage at least once a month using the Fecal Incontinence Severity Index (FISI), and POP as a positive response to "Do you have a bulge or something falling out that you can see or feel in your vaginal area?" from the Pelvic Floor Distress Inventory-20 (PFDI-20). Bone quantity and quality were assessed using BMD and trabecular bone score (TBS), respectively. Skeletal fragility was defined as follows; i) a combined BMD and TBS index equivalent to moderate/severe fracture risk;[1,2] ii) low bone quality, TBS≤1.31;[2] iii) low bone quantity using the traditional World Health Organization criteria, a T-score < -1 or currently on BMD medication.[3] Student's t-test was used for continuous variables, whereas Chi-square test, Fisher's exact test, or Cochran–Mantel–Haenszel test were used for categorical variables as appropriate. Multivariate logistic regression was performed to further assess the association between skeletal fragility and pelvic floor symptoms adjusting for covariates potentially influencing the difference observed between groups. Statistical significance was indicated at a 0.05 level.

RESULTS

Of 681 subjects, 262 and 419 were classified as skeletal fragility versus (vs.) normal using the combined (TBS and BMD) bone assessment. Demographic characteristics were similar between groups except for age (69.0 ± 8.2 vs. 65.0 ± 7.1, p<.001) and smoking (8.8% vs. 3.3%, p<.001). On bivariate analyses, women meeting the combined skeletal fragility criteria had a higher rate of any UI (49.4% vs. 41.4%, p=0.042) and SUI (37.5% vs. 30.1%. p=0.047, Table 1). Using the combined bone assessment, multivariable regression revealed women with skeletal fragility had an increased odds of having any UI (aOR 1.48, 95%CI: 1.05-2.10), SUI (aOR 1.53, 95%CI:1.06-2.21), and MUI (aOR 1.45, 95%CI:1.02-2.05, Table 2). Using the TBS only criteria, women with low bone quality had a higher rate of any UI, SUI, UUI, and MUI (p<0.05, Table 1). Upon multivariable regression, low bone quality was independently associated with an increased risk for any UI (aOR 1.68, 95%CI: 1.15-2.41), SUI (aOR 1.61, 95%CI:1.10-2.36), UUI (aOR 1.65, 95%CI:1.13-2.41), and MUI (aOR 1.64, 95%CI:1.14-2.38, Table 2). Using the BMD only criteria, no difference in UI, FI, or POP was observed between groups (p>0.05, Table 1) or on multivariate analyses (Table 2).

INTERPRETATION OF RESULTS

Postmenopausal women with skeletal fragility using the combination assessment (TBS and BMD) as well as those with low bone quality (TBS) are associated with an increased risk of UI but not FI or POP. Osteoporosis using the traditional definition (low bone quantity, BMD) was not associated with an increased risk of pelvic floor symptoms in postmenopausal women.

CONCLUDING MESSAGE

A potential association between pelvic floor disorders and osteoporosis has been previously reported, however existing data are based solely on BMD. The current study utilized the novel skeletal integrity assessment with the traditional bone density (BMD) and bone quality index (TBS). Using the comprehensive bone assessment, skeletal fragility and poor microarchitecture were independently associated with UI. A pathophysiologic link may exist between skeletal fragility and UI sharing a common underlying mechanism.

FIGURE 1

Table 1: Pelvic floor symptoms comparing skeletal fragility vs. normal in postmenopausal women

	Combined TBS & BMD			TBS only			BMD only		
	Skeletal Fragility n=262	Normal n=419	p-value	Skeletal Fragility n=222	Normal n=459	p-value	Skeletal Fragility n=300	Normal n=381	p-value
Any UI	127 (49.4)	171 (41.4)	0.042	115 (52.5)	183 (40.6)	0.004	133 (44.8)	165 (44.2)	0.888
SUI	97 (37.5)	125 (30.1)	0.047	87 (39.2)	135 (29.8)	0.015	102 (34.3)	120 (31.8)	0.476
UUI	103 (39.8)	139 (33.3)	0.090	97 (44.1)	145 (31.8)	0.002	107 (35.8)	135 (35.8)	0.995
MUI	123 (47.9)	167 (40.2)	0.053	112 (50.9)	178 (39.4)	0.005	129 (43.4)	161 (42.9)	0.896
FI	80 (34.0)	126 (32.1)	0.624	69 (34.9)	137 (31.9)	0.470	91 (34.1)	115 (31.9)	0.573
POP	28 (11.3)	45 (11.3)	0.973	29 (13.8)	44 (10.1)	0.159	31 (11.0)	42 (11.5)	0.816

FIGURE 2

Table 2: Adjusted odds ratio of pelvic floor symptoms comparing skeletal fragility vs. normal

	Combined TBS & BMD		TBS only		BMD only	
	aOR	95% CI	aOR	95% CI	aOR	95% CI
Any UI	1.48	1.05-2.10	1.68	1.15-2.41	1.06	0.75-1.49
SUI	1.53	1.06-2.21	1.61	1.10-2.36	1.15	0.80-1.66
UUI	1.33	0.93-1.90	1.65	1.13-2.41	0.99	0.69-1.42
MUI	1.45	1.02-2.05	1.64	1.14-2.38	1.04	0.73-1.46
FI	1.13	0.78-1.65	1.18	0.78-1.74	1.11	0.77-1.61
POP	0.95	0.55-1.65	1.26	0.72-2.21	1.04	0.61-1.79

Models adjusted for age (centered), obesity, race, hormone therapy, smoking, and vaginal delivery

REFERENCES

1. Hans D, Goertzen AL, Krieg MA, et al. Bone microarchitecture assessed by TBS predicts osteoporotic fractures independent of bone density: the Manitoba study. JBoneMinerRes.2011;26(11):2762–9.
2. Hans D, Stenova E, Lamy O. The Trabecular Bone Score (TBS) Complements DXA and the FRAX as a Fracture Risk

Assessment Tool in Routine Clinical Practice. Curr Osteoporos Rep 2017; 15:521–531
3. Kanis JA, Melton LJ III, Christiansen C, et al. The diagnosis of osteoporosis. J Bone Miner Res. 1994; 9:1137–1141

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THE AGE-DEPENDENT PREVALENCE AND SEVERITY OF URINARY INCONTINENCE AFTER ONE PREGNANCY AND ONE VAGINAL DELIVERY AND THE ATTRIBUTABLE RISK REDUCTION WITH C-SECTION

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HYPOTHESIS / AIMS OF STUDY

The relative importance of pregnancy per se, vaginal delivery, and the potential protective effect of cesarean section on the prevalence of urinary incontinence (UI) in the long-term are still unresolved and controversial issues. The aim of this study was to compare the age-dependent prevalence and severity of different aspects of UI in women aged between 40 and 65 years after one pregnancy and one vaginal delivery, and the attributable risk reduction of UI with C-section.

STUDY DESIGN, MATERIALS AND METHODS

Three randomly selected national cohorts (nulliparous women, one-para women with a vaginal birth and one-para women with cesarean delivery, n = 14 335) were studied. Nulliparous women were obtained by Statistics Sweden. One-para, vaginally and cesarean delivered women were recruited from the Swedish Medical Birth Register and surveyed 20 years after birth. Self-administered, validated questionnaires for different aspects of UI, using the IUGA/ICS definitions (1) and Sandvik's severity index (2), were used. The effect of one pregnancy and one vaginal delivery was analyzed with one-to-one matched cohorts. Matching sought to balance for body mass index and age, shown to be strong confounders of UI (3).

RESULTS

The logistic regression model showed that the age-related gap for UI between nulliparous and 1-para women delivered vaginally or by cesarean section was constant between parallel trajectories that spanned between the ages of 40 and 65 years (Figure 1). Pregnancy increased the overall prevalence of UI from 20.1% to 30.1% (OR1.71, 95%CI 1.43-2.05; p<0.0001) and vaginal delivery increased the overall UI prevalence from 30.1% to 43.0% (OR1.75, 95%CI 1.49-2.05; p<0.0001). Vaginal delivery skewed parameters for severity of UI towards more severe forms. Moderate to severe UI after vaginal birth increased from 12.7% to 19.5% (OR1.67, 95%CI 1.35-2.07; p<0.0001), whereas pregnancy did not alter moderate to severe UI (10.6 versus 12.7%, OR1.25, 95% CI 0.98-1.59; p=0.067). The derived protective effect of C-section, i.e. bypassing vaginal delivery, amounted to a 30% reduction in UI (OR 0.57, 95%CI 0.49-0.67; p<0.0001) and 35-43% reduction of more severe forms of UI.

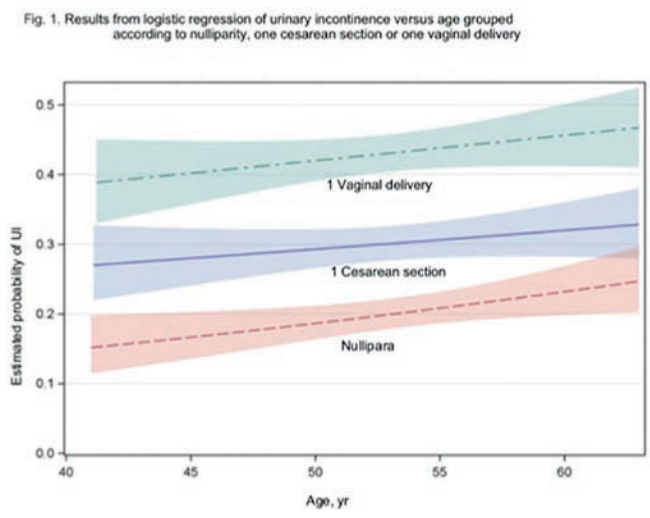
INTERPRETATION OF RESULTS

The results of this study contradict conclusions from some earlier cross-sectional epidemiological reports that have concluded that the protective effect of cesarean section is temporary, restricted to milder forms of UI, or even non-existent.

CONCLUDING MESSAGE

The results of this study indicate that the burden of urinary incontinence after childbirth, all intervening factors equal, does not subside with ageing, but more likely persists throughout life. Cesarean section is protective for the additive effects of vaginal delivery on urinary continence function after pregnancy.

FIGURE 1



REFERENCES

1. Haylen BT, de Ridder D, Freeman RM et al (2010) An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. Int Urogynecol J 21:5–26
2. Sandvik H, Hunskaar S, Seim A, Hermstad R, Vanvik A, Bratt H (1993) Validation of a severity index in female urinary incontinence and its implementation in an epidemiological survey. J Epidemiol Community Health 47:497-499
3. Al-Mukhtar Othman J, Åkervall S, Milsom I, Gyhagen M. Urinary incontinence in nulliparous women aged 25-64 years: a national survey. Am J Obstet Gynecol. 2017 Feb;216(2):149.e1-149.e11

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BEST IN CATEGORY PRIZE "RESEARCH METHODS / TECHNIQUES"

NOVEL SPATIOTEMPORAL MAPPING ALLOWS NEW INSIGHT INTO THE MODALITY OF MYOGENIC MICROMOTIONS IN THE EX-VIVO TETRODOTOXINISED RABBIT AND PIG BLADDER AND THEIR MODULATION WITH PHARMACOLOGICAL AGENTS.

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HYPOTHESIS / AIMS OF STUDY

To investigate the effect of pharmacological manipulation on micromotions of the tetradotoxinised bladder wall of the rabbit and pig, using a sympathomimetic agent, a parasympathomimetic agent, and agents influencing intrinsic myogenic (ICC and myocyte) elements, using single and two dimensional spatiotemporal maps.

STUDY DESIGN, MATERIALS AND METHODS

Investigations were carried out on whole-bladder specimens maintained ex-vivo; pig bladders by arterial perfusion and superperfusion with HEPES solution; rabbit bladders by superperfusion alone. Bladders were filled incrementally with saline. Seven rabbit bladders provided 21 control observations and 21 observations of each experiment (3 replicates each per bladder). One pig bladder provided 3 control observations and one pharmacological observation (a retrospective analysis of previously unreported work). Neural influences were blocked by tetrodotoxin. Intravesical pressure (pVes) was monitored. Uncompressed high definition video was recorded as AVI files. Spatiotemporal mapping was subsequently conducted in a custom designed suite that allowed changes in surface area (between distinctive visual features) to be mapped on a frame-by-frame basis for all points on part of the region of interest (ROI) on the anterior bladder surface. Indices of contractile activity were calculated using FRAGSTATS v4 (a spatial pattern analysis program). Pharmacological agents were added to the superfusion solution in the rabbit preparation and injected into the arterial perfusate perfusing one side of the bladder in the pig preparation. In the rabbit bath concentrations of 0.1μM carbachol, 1μM isoprenaline, 0.05mM carbenoxolone, and 10μM RhoA Y-27632 were used. In the pig, 5mg of the RhoA inhibitor HA-1077 was used. Contaminated superperfusate was discarded after each replicate.

RESULTS

In the rabbit bladder carbachol increased the size, frequency, and speed of propagation of PPCs, causing the percentage mean total area of bladder wall undergoing contraction (PMTA), and pVes to increase. The addition of isoprenaline temporarily halted the incorporation of individual myogenic contractions (PICs) into propagating patch contractions (PPCs), reduced patch size, PMTA and pVes. The gap junction blocker carbenoxolone reduced the duration of PPCs but increased their frequency and velocity of propagation. In both rabbit and pig RhoA inhibitor caused reduction of PMTA, mean patch size, largest patch index (LPI), and pVes. In Tables 1 and 2, NP is the number of patches of contraction occupying the ROI, and LPI (Largest Patch Index) is the mean of the sizes of the largest patches of contraction in each frame as a percentage of the total area of the ROI.

INTERPRETATION OF RESULTS

The cholinomimetic agent carbachol and the β-adrenoceptor agonist isoprenaline (sympathomimetic) acted on the temporal organization of individual contractions (PICs) into PPCs indicating the influence of parasympathetic and sympathetic neural stimulirespectively. Carbachol increased the incorporation of PICs into PPCs, and increased pVes, while isoprenaline did the opposite.

Comparison of the effects of the gap junction blocker carbenoxolone and the RhoA inhibitor Y-27632/HA-1077 on the timing and disposition of contraction indicated that the local spatial spread of contractions in PPCs was governed largely by myocytes, whilst the propagation, frequency and duration of PPCs was likely regulated via gap junctions between ICC-IM and myocytes. The fact that the same changes from the RhoA inhibitor myogenic effect were observed in both pig and rabbit validates this effect

CONCLUDING MESSAGE

Micromotions of the bladder wall have been observed for decades. Recent work suggests that they have a role in the regulation of bladder wall tone and may have clinical relevance, for example in overactive bladder.

Spatiotemporal mapping (STM) has enabled us to determine that micromotions are cyclic propagating patches of contraction (PPCs) that traverse the bladder in a predominantly vertical direction and that these in turn consist of coordinated groups of relatively brief, propagating individual myogenic contractions (PICs) that grow and propagate in a more random fashion within the PPC. Further, we have observed that the formation of PPCs may cease and be replaced by randomly distributed PICs.

Consistent effects of pharmacological manipulation, within and between species, indicates that STM offers an objective means of understanding the maintenance of bladder tone

and the effects of pharmacological agents on the normal and abnormal bladder.

Further work is needed to determine whether the patterns of development of PICs, and their incorporation into PPCs, differ in those of normal subjects from those of patients with abnormal bladder function.

FIGURE 1

Table 1a: ***Effect of pharmacological agents on contractile and PPC metrics of the tetrodotoxinised ex-vivo rabbit bladder.***

		Over-all Contraction Metrics				PPC Metrics				
		PMTA	NP	LPI	Mean Patch Size (mm^2)	Frequency (CPM) (ST Map)	Duration (s) (ST Map)	Velocity (mm/s) (ST Map)	Distance of Propagation (% of PPC's traversing >50% of ST Map)	Baseline Pressure (mmHg)
Carbachol	Baseline	16.56 ±0.88	3.99 ±0.16	13.80 ±0.88	30.29 ±2.80	3.90 ±0.40	3.24 ±0.06	4.52 ±0.69	77 ±2.31	0.72 ±0.15
	Treatment	25.99 ±0.87**	3.96 ±0.16	23.06 ±0.96**	52.88 ±4.03*	16.47 ±0.07***	2.02 ±0.03***	12.03 ±2.64*	93 ±2.31*	1.66 ±0.10*
Isoprenaline	Baseline	18.90 ±0.89	2.76 ±0.11	16.23 ±0.90	58.54 ±4.54	3.9 (±0.40)	3.47 ±0.06	4.04 ±0.72	80 ±1.52	0.61 ±0.08
	Treatment	5.05 ±0.4***	2.64 ±0.14	4.48 ±0.56***	15.98 ±2.41**	NIL	NIL	NIL	NIL	0.16 ±0.01*
Carbenoxolone	Baseline	20.98 ±0.94	3.72 ±0.15	17.63 ±0.95	53.22 ±4.63	3.70 (±0.20)	3.28 ±0.04	4.04 ±0.42	85 ±2.31	1.62 ±0.07
	Treatment	20.88 ±0.90	3.84 ±0.15	17.08 ±0.90	46.07 ±3.67	11.70 (±0.12)***	2.56 ±0.04***	6.48 ±0.13*	72 ±1.73	1.82 ±0.12
RhoA	Baseline	23.03 ±1.21	3.55 ±0.15	18.33 ±1.17	57.37 ±5.46	3.90 ±0.31	3.33 ±0.06	4.15 ±0.88	77 ±4.04	1.46 ±0.02
	Treatment	15.46 ±0.72*	4.25 ±0.16	11.49 ±0.72**	28.68 ±2.57*	5.37 ±0.12*	3.15 ±0.04**	6.28 ±0.99	61 ±1.73*	0.91 ±0.01***

*** < p 0.001, ** < p 0.005, * < p 0.05

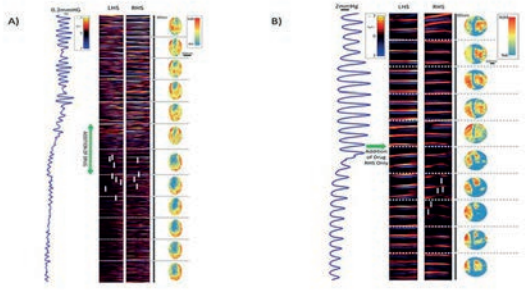
Table 1b: **Comparison of effect of RhoA inhibitor on the contractile metrics of the tetrodotoxinised ex-vivo bladder of rabbit and pig**

		Over-all Contraction Metrics				
		PMTA	NP	LPI	Mean Patch Size (mm^2)	Baseline Pressure (mmHg)
Rabbit	Baseline	23.03 ± 1.21	3.55 ±0.15	18.33 ±1.17	57.37 ±5.46	1.46 ±0.02
	Treatment	15.46 ±0.72*	4.25 ±0.16	11.49 ±0.72**	28.68 ±2.57*	0.91 ±0.01***
Pig	Baseline	17.72 ±1.24	2.62 ±0.12	16.95 ±1.25	502.05 ±52.08	9.78 ±0.15
	Treatment	8.96 ±0.57***	2.91 ±0.13	7.66 ± 0.53***	178.36 ±16***	8.60 ±0.46*

P<0.0001***, P<0.005, P<0.05*

FIGURE 2

Figure 1 Composite of spatiotemporal maps showing the effects of RhoA (Y-27632 1μM bath concentration) in the A) Rabbit and B) Pig (5mg HA-1077 Intravenously, right hand side only) on resting contractile activity of the ex-vivo tetrodotoxinised bladders. In both A) and B): First (left) column, intravesical pressure; second column, L-map on the left vertical transect; third column, L-map on the right vertical transect; fourth column serial spatiotemporal two-dimensional maps each of cumulative changes in strain rate over sixty seconds. White arrows vertical transects show point fragmentation of PPCs into PICs



REFERENCES

1. Lentle RG, Reynolds GW, Janssen PWM, Hulls CM, King QM, and Chambers J. Characterisation of the contractile dynamics of the resting ex vivo urinary bladder of the pig. BJU Int 116: 973-983, 2015.
2. Hulls CM, Lentle RG, King QM, Reynolds GW, and Chambers J. Spatiotemporal analysis of spontaneous myogenic contractions in the urinary bladder of the rabbit: timing and patterns reflect reported electrophysiology. American Journal of Physiology-Renal Physiology 313: F687-F698, 2017.
3. Hashitani H, Brading AF, and Suzuki H. Correlation between spontaneous electrical, calcium and mechanical activity in detrusor smooth muscle of the guinea-pig bladder. Br J Pharmacol 141: 183-193, 2004.

Funding Massey University **Clinical Trial** No **Subjects** Animal **Species** Rabbit, Pig **Ethics Committee** Massey University Animal **Ethics Committee** (MUAEC approval number 14/50)

626 www.ics.org/2018/abstract/626

DISRUPTION OF NO•-SGC SIGNALLING RESULTS IN BLADDER DYSFUNCTION REVERSIBLE WITH SGC ACTIVATORS

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HYPOTHESIS / AIMS OF STUDY

The role of nitric oxide (NO•) signalling in the urinary bladder is not well understood. NO•-mediated relaxation was predominantly demonstrated in bladder neck and urethra, however, robust expression of soluble Guanylate Cyclase (sGC) and NO•-induced cyclic guanosine monophosphate (cGMP) in the urothelium and vascular endothelium/smooth muscle and the efficacy of phosphodiesterase type-5 (PDE5) inhibitors on bladder overactivity symptoms suggest additional sites of action. Since NO• activates sGC with a reduced heme iron (Fe2+) only, NO•-mediated cGMP production is abolished when the oxidation of heme iron is accelerated under oxidative stress conditions [1]. Cytochrome b5 reductase-3 (CyB5R3) has been demonstrated to be a key enzyme to maintain sGC heme in the reduced state [2], however, it can be also downregulated in the condition of oxidative stress. sGC activators, developed as treatment for pulmonary hypertension and fibrosis, can act on oxidized sGC and do not require NO• to produce cGMP. To access the hypothesis that impaired sGC signalling may adversely affect bladder function, we have studied conditional CyB5R3 smooth muscle knockout mice and the effect of sGC activator, BAY 58 2667, on bladder function in these knockout and background control mice.

STUDY DESIGN, MATERIALS AND METHODS

Male four to six week old CyB5R3 smooth muscle conditional knockout and their background/age control mice were decerebrated for anesthetic-free cystometrogram (CMG) and external urethral sphincter electromyogram (EMG) recordings. BAY 58 2667 (3 mg/kg), BAY 63-2521 (3-10 mg/kg) and sildenafil (1 mg/kg) were injected intraperitoneally and their effects recorded for an hour after injection. Experiments were carried out on n ≥ 4 mice. Unpaired student t-test determined differences between knockout versus background control groups or parameters before and after treatment.

RESULTS

Background control mouse CMG and EUS-EMG recordings demonstrate long intercontractile intervals (ICI) and low filling pressures along with EUS bursting and reduction of tonic sphincter activity during voiding (Figure 1A). Conditional smooth muscle CyB5R3 knockout mice exhibit non-voiding contractions, shortened ICI, decreased bladder compliance and voiding efficiency compared to controls (Figure 1B). BAY 58 2667 injection significantly increased ICI, voided volumes and bladder compliance and abolished non-voiding contractions in CyB5R3 knockout mice (Figure 1C). In control mice, it increased ICI and voiding volumes, however, did not significantly affect the compliance (see Table 1). There was no significant difference in external urethral sphincter activ-

ity recordings in control versus knockout mice before and after the treatment. BAY 63-2521 and sildenafil did not have any significant effect on bladder function in CyB5R3 knockout mice (not shown).

INTERPRETATION OF RESULTS

Our results demonstrate that smooth muscle specific conditional knockout mice for CyB5R3 have the symptoms of bladder overactivity including shortened ICI and non-voiding contractions. sGC activator, BAY 58 2667, acting through an NO-independent pathway, improves bladder function in these mice.

CONCLUDING MESSAGE

While the NO•-sGC signalling pathway is known to be involved in relaxation of the bladder neck, our finding supports a role for this pathway in detrusor function. Impaired sGC signalling, due to the knockout of CyB5R3, adversely affects bladder function resulting in non-voiding contractions and shortened ICI. While these symptoms were unresponsive to exogenous NO•, PDE5 inhibitors or sGC stimulators, they were ameliorated following administration of sGC activators.

FIGURE 1

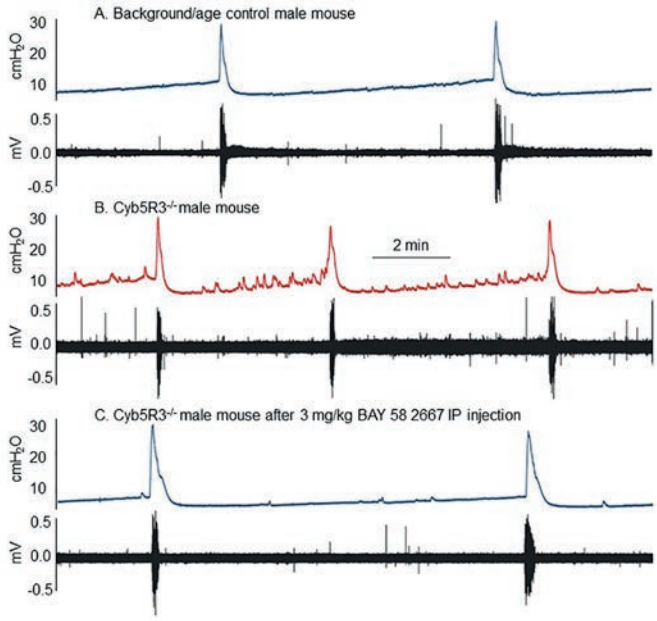

FIGURE 2

	BP, cmH2O	MVP, cmH2O	PT, cmH2O	ICI, sec	BC, µl/cmH2O	NVC / min	VV, µl	RV, µl
Control	5.3 ± 0.1	22.2 ± 0.6	8.5 ± 0.4	415 ± 29	21 ± 4	0.2 ± 0.4	69 ± 8	8 ± 3
Control + BAY 58 2667	4.8 ± 0.5	24.2 ± 0.9	10.2 ± 1.1	569 ± 28*	17 ± 2	0.1 ± 0.2	95 ± 6*	6 ± 4
CyB5R3-/-	7.0 ± 0.3	28.4 ± 2.4	11.2 ± 0.7	273 ± 48*	11 ± 2*	10.5 ± 2.9*	46 ± 9*	18 ± 6*
CyB5R3-/- + BAY 58 2667	5.5 ± 0.3	27.7 ± 1.3	7.9 ± 0.4	589 ± 20**	39 ± 8**	0.7 ± 0.8**	98 ± 6**	5 ± 4**

Baseline pressure (BP), maximal voiding pressure (MVP), pressure threshold (PT), intercontraction intervals (ICI), bladder compliance (BC), number of nonvoiding contractions per ICI (NVC), voided volumes (VV) and residual volumes (RV)
* - p < 0.05 *versus* Control; ** - p < 0.05 *versus* CyB5R3-/-, n≥4

REFERENCES

1. Crassous, P. A. et al. Soluble guanylyl cyclase is a target of angiotensin II-induced nitrosative stress in a hypertensive rat model. Am J Physiol Heart Circ Physiol, 303: H597, 2012.
2. Rahaman, M. M. et al. Cytochrome b5 Reductase 3 Modulates Soluble Guanylate Cyclase Redox State and cGMP Signaling. Circ Res, 121: 137, 2017.

Funding NIH DK098361 **Clinical Trial** No **Subjects** Animal **Species** Mouse **Ethics Committee** University of Pittsburgh Institutional Animal Care and Use Committee

627 www.ics.org/2018/abstract/627

BIOFABRICATED AUTOLOGOUS ADIPOSE DERIVED CELL STRUCTURES RECONSTRUCT CRYO-INJURED URETHRA IN RABBITS

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HYPOTHESIS / AIMS OF STUDY

Previously, we have reported that direct injection of single autologous adipose-derived mesenchymal stem cells (AdMSCs) into cryo-injured urethra could restore structure and function. However, major issue with the direct injection of single cells was low survival and retention rates. Therefore, the present study was designed to enhance the therapeutic potential of AdMSCs by delivering it into biofabricated structures.

STUDY DESIGN, MATERIALS AND METHODS

Adipose tissues harvested from 10-weeks old female New Zealand White rabbits were cultured and labeled with a fluorescent cell linker, PKH26. After the culture, the adherent proliferating cells were seeded into 96-well plates (4×104 cells/well/100µl) to form cell-aggregation called spheroid. The formed spheroids were assembled according to a designed C-type shape by a robotic biofabrication system. The biofabricated structures were perfusion cultured for 7 days. Exposed urethra was sprayed with liquid nitrogen for 20 seconds, and small incision within the frozen region was made. Following, the biofabricated C-type AdMSCs structure was immediately implanted into the incision, and then the incision was closed (n=4). As control, sham operations without the structure were performed in the similar manner (n=4). Two and four weeks after biofabricated AdMSCs structure implantation and sham operation, the urethras were harvested for histological and immunohistological analysis.

RESULTS

Prior to implantation, the cultured cells expressed the mesenchymal cell marker STRO1, but not muscle cell markers, Myoglobin and SMA. At 2 weeks after implantation, the biofabricated AdMSCs C-type structures were survived within the cryo-injured regions. At 4 weeks after implantation, the

cells within the implanted structures differentiated into skeletal (Fig. A) or smooth muscle cells (Fig. B). These cells also formed layered muscle structures at the surrounding neighborhood of implanted structure.

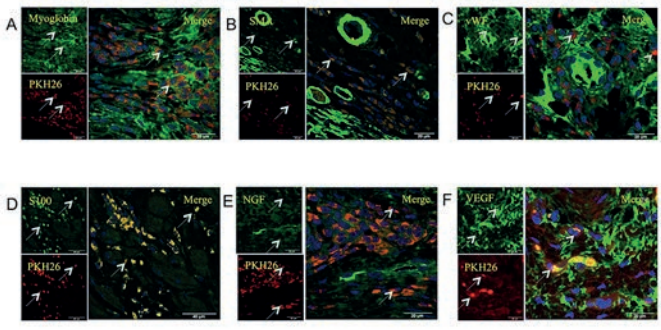
INTERPRETATION OF RESULTS

Histological investigations showed that there were presences of distinct and regenerated muscle structures at 4 weeks after implantation. Also, the reconstructed skeletal and smooth muscle regions in AdMSCs C-type structures implantation group were more developed than those of sham-operated control group. The implanted PKH26 labeled C-type AdMSCs within the structure were positive for endothelial cell maker antibody, von Willebrand factor (vWF, Fig. C) or nerve cell marker antibody, S100 (Fig. D). In addition, some cells within the implanted structures secreted nerve growth factor (NGF, Fig. E), vascular endothelial growth factor (VEGF, Fig. F).

CONCLUDING MESSAGE

Our results demonstrated that autologous biofabricated C-type AdMSCs structures might have potential to reconstruct the urethra and treatment of various urethral injuries and dysfunctions by differentiating into skeletal muscle cells, smooth muscle cells, blood vessels, nerve cells and/or secretion of growth factors. Furthermore, spheroids based three-dimensional biofabrication of AdMSCs structures could be the simple and effective strategy of cell delivery for stem cell therapy for reconstruction of the damaged urethra.

FIGURE 1



Figures. Differentiation of AdMSCs within the implanted biofabricated C-type structures into (A) skeletal muscle (myoglobin positive), (B) smooth muscle (smooth muscle actin positive), (C) endothelial cells (von Willebrand factor positive), and (D) nerve cells (S100 positive) at 4 weeks after implantation. The biofabricated AdMSCs structure secreted (E) nerve growth factor (NGF), and (F) vascular endothelial growth factor (VEGF). Arrows: AdMSCs within the implanted biofabricated C-type structures (Red) and specific markers (Green).

Funding None **Clinical Trial** No **Subjects** Animal **Species** Rabbit **Ethics Committee** Animal **Ethics Committee** of Shinshu University

628 www.ics.org/2018/abstract/628

STATE-DEPENDENT PUDENDAL NERVE STIMULATION TO INCREASE BLADDER CAPACITY AND VOIDING EFFICIENCY IN CATS

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HYPOTHESIS / AIMS OF STUDY

Despite the increased use of botulinum toxin A and sacral neuromodulation to treat the symptoms of overactive bladder, many patients fail to find adequate symptom relief using these therapies. Pudendal nerve stimulation is a promising alternative approach to these third-line therapies for treating overactive bladder symptoms that is not yet in clinical use.

Recent work demonstrated that electrical stimulation of the sensory pudendal nerve in rats increases bladder capacity [1]. However, the stimulation parameters that most strongly inhibited the bladder during filling also caused substantial reductions in voiding efficiency.

Those results motivated the present study in cats combining continuous stimulation of the dorsal genital nerve, as well as state-dependent stimulation of the dorsal genital and motor pudendal nerves. State-dependent stimulation used one stimulus pattern to promote bladder storage during the filling phase and another stimulus pattern to promote bladder voiding during the emptying phase.

The aims of the study were to determine whether we also saw a decrease in voiding efficiency from continuous stimulation, as has been reported in rats, and to determine whether state-dependent stimulation increased both bladder capacity and voiding efficiency relative to a no-stimulation condition.

STUDY DESIGN, MATERIALS AND METHODS

Electrical stimulation of branches of the pudendal nerve was conducted in male cats anesthetized with chloralose (n=6). Bipolar nerve cuffs were placed on the dorsal genital (DGN) and motor branches of the pudendal nerve. Wires were placed percutaneously to measure evoked anal sphincter EMG in response to stimulation. A bladder catheter was placed through the dome of the bladder for filling and pressure measurement. Bladder capacity and voiding efficiency were measured from single-fill cystometrograms using saline with a non-occluded urethra.

Bladder inhibition was achieved by stimulating the DGN at 10 Hz and 3T (3x the amplitude required to evoke reflexive EAS EMG activity). In some trials this stimulation persisted throughout voiding (continuous stimulation), mimicking traditional stimulation paradigms. In other trials at the onset of voiding the stimulation was terminated (fill-only stimulation), or a different stimulus was employed to promote voiding (state-dependent stimulation). Stimuli used to promote voiding were either 33 Hz, 3T stimulation of the DGN

or a bursting pattern applied to the pudendal motor branch. Bursting occurred at the minimum stimulus amplitude which generated the maximal EAS EMG response.

Stimulus patterns were randomized within block and values were normalized to preceding control levels for plotting and summary statistics. Voiding efficiency was compared between no-stimulation controls, continuous stimulation, and the state-dependent stimulation conditions using the Friedman ANOVA test, followed by the Benjamini, Krieger and Yekutieli two-stage step-up method for post-hoc comparison of conditions to continuous stimulation in GraphPad (Version 7.04) with $p<0.05$ considered to be significant.

RESULTS

Example data are shown in Figure 1. Continuous 10 Hz stimulation of the DGN increased bladder capacity by a median of 26%, and, as reported for the rat, decreased voiding efficiency in 5 of the 6 experiments (median 33% decrease) relative to controls although this trend was not statistically significant ($p = 0.072$, n=5).

Relative to no-stimulation controls, both termination of continence-promoting 10 Hz DGN stimulation at the onset of voiding and 33 Hz stimulation during voiding increased voiding efficiency (median increases of 14% and 19%, respectively), although neither was statistically significant ($p>0.05$, n=5). The largest and most consistent increase in VE came from switching from 10 Hz DGN stimulation to motor nerve burst stimulation, which produced a 379% median increase in VE ($p=0.028$, n=5).

Relative to continuous stimulation, state-dependent stimulation led to significant increases in voiding efficiency ($p=0.003$ for ANOVA test, $p=0.028$ for fill only, $p=0.048$ for 33 Hz, $p<0.001$ for motor bursting, n=5).

INTERPRETATION OF RESULTS

Similar to results in rats, continuous stimulation of the DGN to inhibit the bladder and increase capacity during filling also inhibited voiding in 5 of 6 animals, with a median decrease of 33%. This result however was not statistically significant ($p = 0.072$, n=5), likely due to the small number of animals tested.

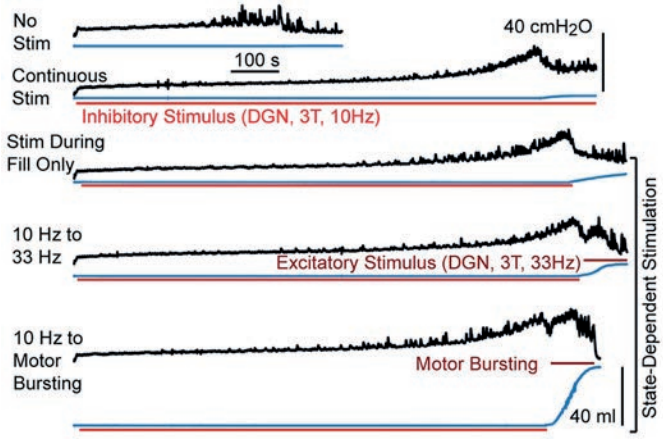
All state-dependent stimulation approaches, including terminating the stimulus during voiding, increased voiding efficiency relative to continuous stimulation. However only one state-dependent stimulation paradigm, motor-bursting during voiding, reliably increased voiding efficiency relative to control values. Traditional stimulation of the pudendal nerve or its subcomponents (e.g., dorsal genital nerve) do not target individually the motor and sensory components. Future work remains to determine how best to translate this approach to the clinic.

Stimulation of the dorsal genital nerve at 33 Hz increased voiding efficiency relative to controls by 19% but this result was not statistically significant due to high variability and the small number of experiments. This approach remains attractive for further testing as implementing this approach clinically would be relatively straightforward [2].

CONCLUDING MESSAGE

Electrical stimulation of the pudendal nerve is a promising approach for treating overactive bladder symptoms. Continuous pudendal nerve stimulation increases bladder capacity but may so strongly inhibit the bladder so as to reduce the efficiency of subsequent voiding. State-dependent stimulation, using different stimulation paradigms to promote both bladder filling and voiding, increased bladder capacity relative to controls and voiding efficiency relative to continuous stimulation in male cats. Motor stimulation during voiding also reliably increased voiding efficiency beyond control levels. State-dependent stimulation of the pudendal nerve may be a useful approach for treatment of overactive bladder symptoms.

FIGURE 1



REFERENCES

1. Hokanson JA, Langdale CL, Sridhar A, Grill WM. Stimulation of the Sensory Pudendal Nerve Increases Bladder Capacity in the Rat. Am. J. Physiol. Renal Physiol. (November 15, 2017). doi: 10.1152/ajprenal.00373.2017.
2. Goldman HB, Amundsen CL, Mangel J, Grill JH, Bennett M, Gustafson KJ, Grill WM. Dorsal genital nerve stimulation for the treatment of overactive bladder symptoms. Neurourol Urodyn 27: 499–503, 2008.

Funding Galvani Bioelectronics and NIDDK K12 DK100024 **Clinical Trial** No **Subjects** Animal **Species** Cat **Ethics Committee** IACUC

629 www.ics.org/2018/abstract/629

A NOVEL APPROACH TO MOUSE DETRUSOR MUSCLE PHYSIOLOGY: ACUTE TISSUE SLICE TECHNIQUE AND ITS APPLICATION

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HYPOTHESIS / AIMS OF STUDY

Physiology of the detrusor muscle is very complex, as smooth muscle cells (SMC) of detrusor are part of several receptor and signalling pathways. Moreover, detrusor muscle undergoes a series of functional and morphologic changes under influence of different pathophysiological conditions such as bladder outlet obstruction. Considering anatomic and physiologic changes in detrusor muscle of different species, it becomes apparent that investigating detrusor physiology and responses to different stimuli is a challenging task. The aim of our study was to develop a novel methodological approach to study detrusor physiology in mice and investigate the possibilities of its application.

STUDY DESIGN, MATERIALS AND METHODS

To prepare tissue slices, adult female NMRI mice were sacrificed utilizing CO2 and cervical dislocation. Abdomen was accessed via lower median laparotomy and bladder was carefully dissected. Dissected bladder was immediately transferred into ice-cold calcium-free Krebs solution (gassed with carbogen). Subsequently, connective tissue and urothelium were gently removed from detrusor muscle under a light stereomicroscope. Isolated detrusor muscle was cut into slices using scissors and transferred into fresh ice-cold calcium-free Krebs solution, where it was incubated for 15-20 minutes. Next, tissue slices were loaded with a membrane–permeable calcium reporter dye fluo-4-AM at 5 µM final concentration in HEPES-buffered solution (HBS) for 35-40 minutes at room temperature on a shaker at 50 strokes per minute. Tissue slices were then transferred into ice-cold HBS and kept on ice until calcium imaging.

Calcium imaging was performed immediately after tissue slice preparation using the inverted confocal microscope Leica TCS SP5 II. Calcium dye was excited using argon laser at 488 nm and emitted fluorescence was detected with HyD detector. For calcium imaging, individual slices were transferred into the recording chamber and perifused with HBS at 37 oC. To investigate responses of the detrusor muscle to pharmacological stimuli, tissue slices were stimulated with increasing concentrations of the cholinomimetic drug carbachol (CCh) in HBS according to the following stimulation protocol: HBS only, 1 µM, 10 µM, 25 µM, 50 µM, and 100 µM CCh, and then again HBS only. Each step of the protocol lasted for 300 seconds. Obtained time series were analysed using custom software, Matlab and MS Excel.

RESULTS

Using our acute tissue slice technique, approximately three to four pieces of detrusor muscle tissue sized 3-4 mm2 could be obtained out of one adult size murine bladder. Figure 1 shows detrusor tissue slice loaded with calcium dye under an inverted confocal microscope. Detrusor muscles of five female mice were used and responses of 152 SMCs were obtained. Three different phenotypes of SMCs responses were observed after CCh stimulation: (i) SMCs with spontaneous activity in the form of calcium spikes prior to CCh stimulation that remained unaffected by CCh stimulation (38.2 % of all cells), (ii) SMCs without spontaneous activity but with induced spiking activity after stimulation with CCh (49.3 % of all cells), and (iii) SMCs with spontaneous activity prior to stimulation and increased spiking activity after CCh stimulation (12.5 % of all cells). The percentage of activated SMCs (phenotype (ii) and (iii)) increased with increasing concentrations of CCh. The dose-dependency curve is relatively steep as increasing CCh from 1 µM to 25 µM CCh caused the activation of virtually all (96.8 %) SMCs (Figure 2). The same concentration of CCh also caused contraction of the tissue slice, which could be seen under the microscope.

INTERPRETATION OF RESULTS

Our acute mouse detrusor muscle tissue slice technique is a relatively simple, quick and inexpensive preparation method. Using one adult size female murine bladder, approximately three to four tissue slices and stimulation protocols can be utilized. If kept on ice in cooled HBS, they can be used up to four hours after preparation. We showed that using this technique, SMCs are viable and respond physiologically with oscillatory behaviour of intracellular calcium concentration to stimulation with the cholinomimetic CCh. According to our results, SMCs in detrusor tissue slices exert three types of responses: spontaneous activity with no response to CCh stimulation, induced activity after CCh stimulation, and spontaneous activity prior to and induced activity after CCh stimulation. Percentage of activated SMC increases with increasing concentration of CCh within a relatively narrow concentration range for activation of SMCs. 25 µM CCh resulted in saturation of SMC recruitment and also turned out to be the cut-off concentration at which contraction of the tissue was visible. In our opinion, there are many implications for use of this technique in murine detrusor muscle physiology research, as different pharmacological agents can be tested in situ under well-controlled conditions. Moreover, the method can be used to investigate the effect of different overactive bladder treatment modalities on SMC activity, which could help us towards a better understanding and a more effective treatment of this disorder.

CONCLUDING MESSAGE

Acute mouse detrusor muscle tissue slice technique is a novel and promising method that allows for research of detrusor muscle physiology as well as of the pathophysiological and therapeutic aspects of some urinary bladder disorders.

FIGURE 1

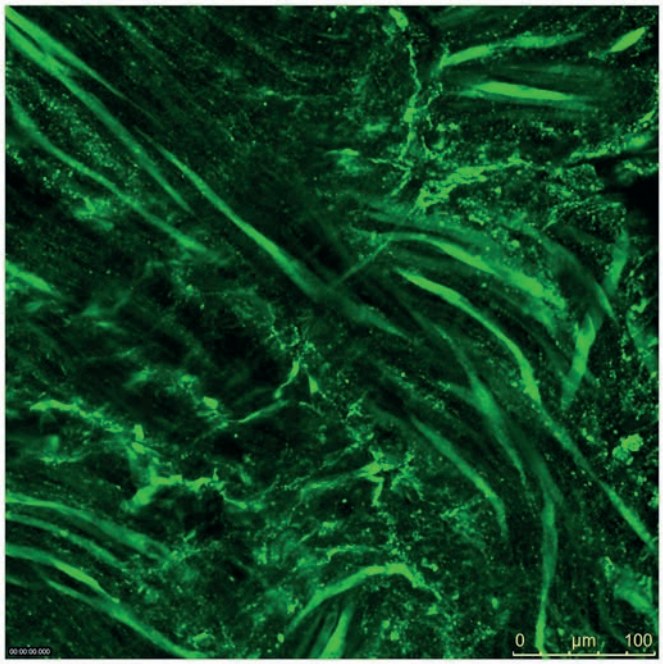
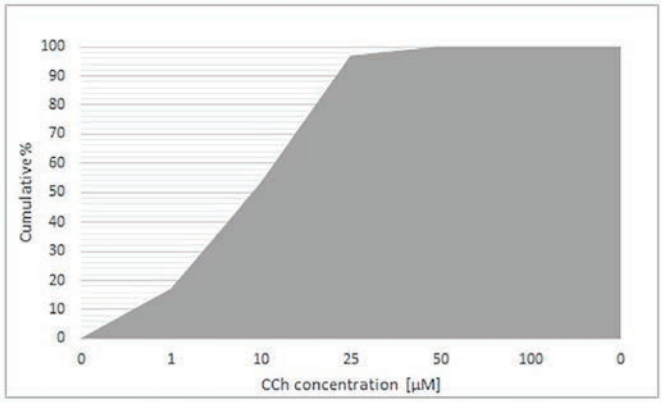


FIGURE 2



Funding Project was funded by University Medical Centre Maribor, Maribor, Slovenia **Clinical Trial** No **Subjects** Animal **Species** Mouse **Ethics Committee** Research **Ethics Committee** of Botucatu Medical School - UNESP (CAAE 40418215.8.0000.5411).ublic of Slovenia for food safety, veterinary sector and plant protection.

630 www.ics.org/2018/abstract/630

TARGETING OXYTOCIN FOR THE TREATMENT OF BLADDER OUTLET OBSTRUCTION DUE TO BENIGN PROSTATIC HYPERPLASIA

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HYPOTHESIS / AIMS OF STUDY

The pathogenesis of Benign Prostatic Hyperplasia (BPH) is associated with both the non-malignant growth of the prostate (static component), and / or increased prostatic smooth muscle tone (dynamic component) which can lead to irritative and obstructive lower urinary tract symptoms, as a result of bladder outlet obstruction. While not life threatening, BPH significantly affects the quality of life of patients. A recent study has shown that the levels of circulating oxytocin are significantly upregulated in men with BPH, and exogenous oxytocin significantly increased the proliferation of prostatic fibroblasts [1].

Our hypothesis is that oxytocin modulates the contractile activity of the prostate gland in BPH, thereby contributing to the dynamic component of this condition.

The aims of this study were to investigate whether i) oxytocin regulates the smooth muscle tone of the human prostate gland and ii) the effect of an oxytocin antagonist on human prostate contractility.

STUDY DESIGN, MATERIALS AND METHODS

Samples of non-malignant human prostate were collected from the transition (TZ) and peripheral zone (PZ) of men undergoing radical prostatectomy for mild to moderate prostate cancer. Immunohistochemistry was used to confirm the presence and localization of the oxytocin receptor. Tension recordings were obtained using organ bath techniques; increasing concentrations of oxytocin (0.1nM to 10µM) or atosiban (1nM to 300nM) were exposed to the samples. The amplitude (N/g) and frequency of spontaneous contractions +/- drug treatment were quantified. A paired Student's t-test or ANOVA was used to test for statistical significance ($P < 0.05$).

RESULTS

Using Immunohistochemistry, the oxytocin receptor was found to be widely expressed in both the epithelial and stromal compartment of TZ and PZ specimens of human prostate (n =10). Application of exogenous oxytocin to TZ specimens significantly upregulated the frequency of spontaneous contractions at 10µM by 70 ± 21% when normalized to baseline frequency ($p < 0.05$, $n = 8$). The half-maximal increase in frequency (EC50) occurring at 300nM. A similar effect was observed in patient matched PZ specimens (n=4). The oxytocin receptor antagonist, atosiban produced a concentration dependent decrease (1nM-300nM) in the ampli-

tude and frequency of the spontaneous contractile events (n=10).

INTERPRETATION OF RESULTS

We can confirm that oxytocin receptors are widely expressed in the TZ and PZ of the human prostate gland. In addition, oxytocin induces contractility of the TZ and PZ of the human prostate gland. Moreover, spontaneous contractile activity in both the TZ and PZ of the human prostate gland are significantly reduced by the oxytocin receptor antagonist, atosiban. Oxytocin may be a valid, novel target for the treatment of bladder outlet obstruction due to enhanced prostatic contractility as a result of BPH.

CONCLUDING MESSAGE

Given that patients with BPH have elevated levels of oxytocin and that oxytocin has previously been shown to induce proliferation of prostate fibroblasts, is widely expressed in both the prostate stroma and epithelium, and is able to induce muscle contractility, targeting of the oxytocin receptor and associated downstream signalling mechanisms may be an attractive prospect in designing new and novel pharmacotherapies for treating the irritative and obstructive lower urinary tract symptoms associated with BPH.

REFERENCES

1. Xu, H., et al., Oxytocin: its role in benign prostatic hyperplasia via the ERK pathway. Clin Sci (Lond), 2017. 131(7): p. 595-607.

Funding No financial disclosures **Clinical Trial** No **Subjects** Human **Ethics Committee** Cabrini Human Research **Ethics Committee** (13-14-04-08), Epworth HealthCare Human **Ethics Committee** (53611) and Monash University Human Research **Ethics Committee** (2004/145). **Helsinki** Yes **Informed Consent** Yes

631 www.ics.org/2018/abstract/631

USE OF ACCELERATED FATIGUE TESTING AS A SIMPLE IN VITRO TEST FOR ASSESSING MATERIALS FOR THE SURGICAL TREATMENT OF STRESS URINARY INCONTINENCE AND PELVIC ORGAN PROLAPSE

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HYPOTHESIS / AIMS OF STUDY

Some mesh material used in surgical treatment of stress urinary incontinence (SUI) and pelvic organ prolapse (POP) is associated with serious complications in patients (1). Increasing amount of evidence suggests that PPL material is not biomechanically compatible with the dynamic environment of the female pelvic floor. All meshes implanted in this site will undergo continuous deformation for decades. Materials which undergo irreversible plastic deformation under repeated loading may lead to material failure and/ or change in the mechanical properties of the mesh.

Although the uniaxial mechanical testing of mesh materials is reported (2), we were unable to find published studies of fatigue testing of these materials.

We hypothesized that a test as simple as three-day fatigue testing would be sufficient to distinguish between materials which have already been found to cause complications clinically and newer materials yet to be tested clinically. We propose this as an easy way to eliminate materials will are mechanically inappropriate for implantation in the pelvic floor.

Our aim was to test the hypothesis that a very simple fatigue testing regime would be sufficient to identify those materials which have previously caused problems clinically in a comparison of 4 commercial meshes and two new electrospun materials not yet evaluated in the clinic. Uniaxial tensile properties were compared before and three days of continuous 25% dynamic distension applied using a dynamic bioreactor.

STUDY DESIGN, MATERIALS AND METHODS

Two electrospun materials made of polyurethane (PU) and ureidopyrimidinone-polycaprolactone (UPy) that have not yet been evaluated in the clinic and four other commercially available meshes were included in the study. Two of the meshes were fabricated from PP, a heavy weight PP mesh, Gynemesh® (Johnson & Johnson) and a new ultra-light weight PP mesh, Restorelle® (Coloplast, Humlebaek, Denmark). The two other commercially available materials were made of polyvinylidene fluroride (PVDF) DynaMesh®-ENDOLAP and Dynamesh®-PR4 (Dynamesh, Aachen, Germany).

A tensiometer (BOSE Electroforce test instruments, Minnesota, USA) was used to perform the uniaxial tensile test and cyclic testing (Figure 1). Samples (n=6, for each material) were cut keeping uniform width and length (30mm x 5mm). For the cyclic test, the material was stretched for 10 cycles at a rate of 1mm/s and the displacement was adjusted to 25% of its original length. Plastic deformation was measured as the initial % of strain for each sample at the tenth cycle without an increase in stress due to this plastic deformation. For uniaxial tensile testing, a force was applied at a rate of 0.1 mm/s and a displacement of 7mm. Stress vs strain plots are shown as strength (y axis, MPa) by % of displacement (x axis, %). The initial linear gradient of each plot was taken as the Young's modulus (N/mm2), which is used to measure the stiffness of the material. The failure point was used to measure the ultimate tensile strength (UTS) (y axis) and the maximum strain (x axis).

Simulated fatigue testing was performed using a TC-3 load bioreactor (Ebers Medical Technology SL, Zaragoza, Spain) and samples were subjected to cyclic uniaxial distension using 25% elongation, 0.1mm/s rate and 18 cycles per minute

over 3 days in phosphate buffered solution at 37oC, 5% CO2. Samples were then re-assessed using the uniaxial tensile test as above.

RESULTS

In uniaxial testing, the first thing to note is that most of the materials were able to be stretched until the end of the test (an 80% distension) without significant breaks (Figure 2). Both of the electrospun materials, PU and UPy coped with this 80% deformation whilst maintaining a constant resistance to applied force. Cyclic testing showed that the main change in the mechanical behavior of the different materials happened between cycle 1 and cycle 2 for all materials with permanent mechanical deformation especially for the 4 meshes.

After fatigue testing for three days, all commercial meshes failed before they reached 80% strain while the two electrospun meshes as before coped with 80% displacement (Figure 2).

INTERPRETATION OF RESULTS

Our study demonstrates that the currently used PP and PVDF meshes are strong but rigid materials which plastically deform after just 3 days of stretching on a regular dynamic cycle whereas the 2 new materials, each based on electrospun materials, have more elastic properties with much less deformation.

CONCLUDING MESSAGE

We suggest that a test as simple as this three-day fatigue testing is sufficient to distinguish between materials which have already been found to cause complications clinically and newer materials yet to be tested clinically which will hopefully prove more mechanically appropriate for implantation in the pelvic floor.

FIGURE 1

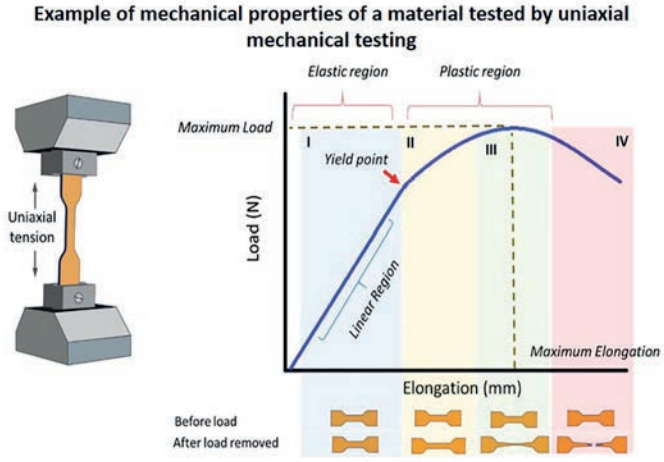
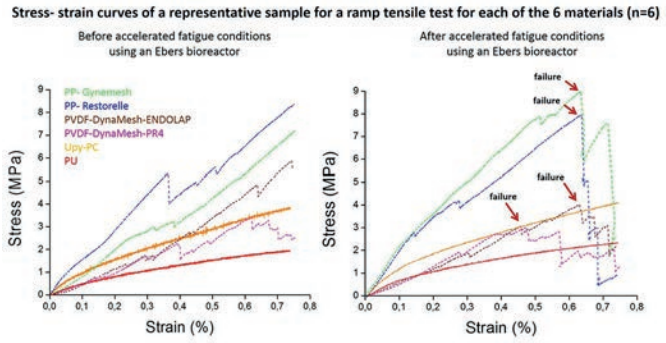


FIGURE 2



REFERENCES

1. Milani, A. L., Damoiseaux, A., IntHout, J., Kluivers, K. B. and Withagen, M. I. J. Long-term outcome of vaginal mesh or native tissue in recurrent prolapse: a randomized controlled trial. Int. Urogynecol. J. (2017). doi:10.1007/s00192-017-3512-3.
2. Shepherd, J.P., Feola, A. J., Abramowitch, S.D., and Moalli, P. A. Uniaxial biomechanical properties of 7 different vaginally implanted meshes for pelvic organ prolapse. Int. Urogynecol. J. (2012). doi:10.1007/s00192-011-1616-8.

Funding Rosetrees Trust **Clinical Trial** No **Subjects** None

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DECREASE OF ESTROGEN INFLUENCES VESSEL DAMAGE AND INCREASE SKIN TEMPRATURE RECEPTOR CHANNELS WHICH WILL PROVOKE COLD STRESS RELATED FREQUENCY

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HYPOTHESIS / AIMS OF STUDY

Menopause is a condition that almost all women experience. Decreased secretion of estrogen influences the whole body and causes many changes. Overactive bladder symptoms occur in a very early stage in menopause women. Furthermore, menopause women experience increased sensitivity to cold which may cause urinary frequency. Former research has showed that decrease of estrogen shows cold stress related frequency in aged rats, which are correlated with increase of TRPM8 channels in the skin. However, in this study, decrease of estrogen did not show increase of cold stress related frequency or increase of TRPM8 channels in young rats. From these results, we estimated that decrease of estrogen against bladder function and skin temperature channels may be an indirect functional mechanism which are correlated with aging such as vessel damage. The purpose of this study was to assess the relation of blood flow and decreased estrogen against cold stress related frequency, including dif-

ference in expression of temperature channels in the skin, using an ovariectomy model.

STUDY DESIGN, MATERIALS AND METHODS

A total of 28 female Spontaneously Hypertensive rats (160-180g) at postnatal week 10 were used for the experiments. The rats were randomly divided into sham operation group (Sham; n=10) and ovariectomy group (OVX; n=18), which received bilateral ovariectomy to induce surgical menopause. All rats underwent operation under anesthesia (sevoflulane 3%). Four weeks later, the rats were anesthetized and the urinary bladder was exposed and incised at the center of the dome. A polyethylene catheter was inserted and the free end was funneld subcutaneously and exteriorized t the back of the neck. Three days after cannulation, the rats received cystometography (CMG) under cold stress un-anesthetized. CMG was first performed in room temperature (RT, median 25 celsius) for 20 minutes. The rats were then put into low temperature (LT, median 4 celsius) for 20 minutes. After LT, the rats were put into RT again for 20 minutes. Voiding interval and micturition volume were measured to see the change rate between RT and LT. Secondly, 10 female Spontaneously Hypertensive rats at postnatal week 14 which were ovariectomized 4 weeks prior, received surgical transplantation of an osmotic pump under the skin and were randomly divided into estrogen replaced group (EST; n=5), which estrogen including corn oil was placed in the pump, and control group (CTL; n=5), which corn oil was placed. 4 weeks after transplantation, all rats received CMG under cold stress. Before CMG, all rats underwent measurement of blood flow of the bladder using a laser calculation device (Omega Zone). After CMG, skin from the lower back and the whole bladder were harvested for RT-PCR and immunohistology to see the effect of decrease and replacement of estrogen against neurochemical receptors.

RESULTS

Cold stress CMG showed increased frequency in OVX rats compared to Sham rats. EST rats showed improvement of frequency compared to CTR rats (Fig 1). RT-PCR showed increase of TRPV1 channels in the bladder in OVX rats, but improvement in EST rats. Blood flow of the whole bladder measured by laser calculation did not show any difference between OVX and Sham rats. However, HIF-1 alpha in the bladder mucosa, which were histologically measured showed an increase in OVX rats. TRPM8 channels in the skin showed an increase in OVX rats compared to Sham rats, but an improvement in EST rats (Fig 2).

INTERPRETATION OF RESULTS

From this study, decrease of estrogen showed increase of TRPM8 channels in the skin and cold stress related frequency in young rats. The mechanism of decreased estrogen against these results may be an indirect mechanical function via vessel damage. Furthermore, decrease of estrogen causes impairment of blood flow in the bladder mucosa, but not in the muscle layer in an early stage, which may cause difference in expression of neurochemical receptors. Early expression of overactive bladder symptoms with decreased estrogen maybe due to micro ischemia of the bladder mucosa.

CONCLUDING MESSAGE

Decrease of estrogen influences vessel damage which increases TRPM8 channels in the skin and will provoke cold stress related frequency. Decrease of estrogen against bladder function may be influenced by an very early stage of vessel damage which maybe an option for treatment of overactive bladder in menopause women.

FIGURE 1

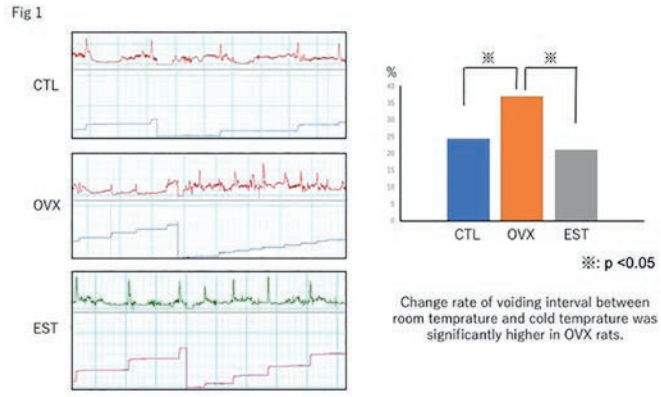
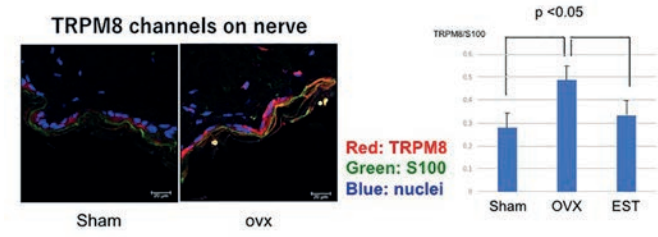


FIGURE 2



Funding None **Clinical Trial** No **Subjects** Animal **Species** Rat **Ethics Committee** Shinshu university school of medicine animal experiment ethics committee

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THE LATZKO; A HIGH VALUE, VERSATILE VESICOVAGINAL FISTULA REPAIR

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INTRODUCTION

The Latzko repair is a classical technique for vesicovaginal fistula repair using a vaginal approach. As an outpatient procedure with minimal morbidity and low cost, the Latzko is a high value procedure. The Latzko is likely underutilized due to prevailing myths. These myths include that it cannot be used for fistulae at the apex or complex fistulae, that it can-

not be performed with a uterus in place, and that it shortens the vagina.

DESIGN
The objective of this video is to review the basic steps of the Latzko technique, provide tips and tricks for ensuring a successful procedure and illustrate variations in use for this adaptable technique.

RESULTS
Optimal exposure is key and can be achieved with the use of a vaginal self retaining retractor and a posterior weighted speculum. A pediatric foley in the fistula is important to allow for downward traction. Vasopressin injection through a small needle is essential to hydro-dissect the epithelium off of the underlying layers. A circumscribing incision is made around the fistula. The incision should be 2-3 cm in diameter. The epithelium is then completely denuded. Leaving the fistula tract in situ as opposed to excising it prevents fistula enlargement and postoperative hematuria. The first step of fistula closure is to place a purse string suture just outside the epithelialized tract. This is done using a fine suture and needle. As the purse string suture is tied down, the foley is removed. Imbricating sutures are then placed as a second layer taking care to close any dead space at the base of the defect. One to two subsequent imbricating suture layers are placed. The vaginal epithelium is closed in a running fashion.

We subsequently present the versatility of the Latzko technique. In the first variation we present a case of a large vaginal vault prolapse with vesicovaginal fistula following hysterectomy. The same Latzko steps as described previously are completed. The apical suspension procedure can then commence. In this case a Michigan 4 wall sacrospinous ligament suspension was performed. A diamond shaped incision is used in this operation and positioned medial to the fistula repair in order to avoid tension on the closure. In the second variation a 54 year old woman had undergone a nephro-ureterectomy for urothelial malignancy complicated by vaginotomy repaired with an omental flap. She developed urinary leakage several days after surgery and was found to have a 1.5cm vesicovaginal fistula lateral to the cervix. In this case, the closure technique varies from the standard. Given the size of the defect, a series of imbricating interrupted stitches were used for the first layer instead of a pursestring. In the third variation a woman presented with a complex fistula between a bladder diverticulum and vagina following an emergency cesarean section complicated by cystotomy and bilateral ureteral injuries. She had undergone two ureteral reimplantation surgeries before the fistula repair. Fluoroscopy demonstrates the large bladder diverticulum formed by a previous urinoma and contrast extravasation into the vagina. Her complex anatomy was difficult to discern, but imaging confirmed that the ureter was not involved in the fistula, so plan was made to proceed with Latzko repair. After Latzko repair and repair of a chronic cervical laceration, she had complete resolution of her urinary leakage.

CONCLUSION
In summary, the Latzko vesico-vaginal fistula repair is a versatile minimally invasive procedure that allows patients to have an outpatient surgery with minimal postoperative pain and low complication rate.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** This study is considered IRB "not regulated" status **Helsinki** Yes **Informed Consent** Yes

634 www.ics.org/2018/abstract/634

URETHROPLASTY: URETHRAL-CLITORAL ECTOPY

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INTRODUCTION
Female urethral duplication is an extremely rare congenital anomaly with multiple hypotheses to describe its etiology. We present the surgical management of a woman with partial urethral duplication present in the glans clitoris and concurrent stricture of the orthotopic urethra.

DESIGN
Our patient is a 38-year old woman with a congenitally solitary right kidney who has had a urethral stricture for over 20 years requiring monthly dilations. She has a partial urethral duplication opening on the glans clitoris from which she voids when her stricture recurs and her true urethra narrows. She elected to have the urethral stricture excised, without removal of the accessory urethra in the glans clitoris. The urethral stricture was managed using the Blandy vaginal flap urethroplasty technique. The intraoperative use of a nasal speculum is illustrated in the video to aid with intraurethral visualization.

RESULTS
The patient had resolution of her voiding dysfunction, with decrease in post-void residual volume from 393mL preoperatively to 108mL at follow-up. A normal external appearance of clitoris and vagina postoperatively is illustrated. She has rare drops of urine to no outflow from her clitoral accessory urethra.

CONCLUSION
Vaginal flap urethroplasty can successfully treat a distal urethral stricture and avoid excision of a urethral duplication anomaly, which may compromise sexual function.

REFERENCES
1. McGuire E, Ritchey ML and Wan JH: Surgical therapy of uncontrollable detrusor contractility. In: Female Urology. Edited by Kursh ED and McGuire EJ. Philadelphia: J.B. Lippincott Co 1994; pp 121-124.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** IRB Exempt **Helsinki** Yes **Informed Consent** Yes

635 www.ics.org/2018/abstract/635

EVALUATION AND TREATMENT OF FEMALE URETHRAL STRICTURE WITH DORSAL ONLAY BUCCAL MUCOSA GRAFT URETHROPLASTY

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INTRODUCTION
Female urethral strictures can present significant challenges both from the diagnostic and therapeutic standpoints. The objective of this video is to demonstrate the use of urethral ulrasound in the evaluation and of a buccal mucosa graft in the treatment of female urethral strictures.

DESIGN
Over the past five years, a technique of dorsal onlay buccal mucosa graft urethroplasty has been developped in an academic department of urology striving to improve outcomes compared to existing technique (dilations, vaginal-flap "Blandy" urethroplasty,…). Over the past few months, a gel infused translabial ultrasound technique has been set up in this same department trying to help better evaluating female urethral strictures. These two techniques are presented and described in the present video through the case of a 50 years-old female patient with history of urethral stricture, slow urinary stream, urinary tract infections and urinary urgency and frequency. The patient had undergone multiple dilations in the past with recurrence of the stricture.

RESULTS
For the gel-infused translabial ultrasound, an 8 MHz probe is used to image the urethra while instilling 20cc of lidocaine jelly to distend the urethra. Evaluation of the urethra from meatus to bladder neck is completed and stricture location, length, caliber and presence of peri-urethral fibrosis is assessed. In the case presented herein, the stricture could be clearly identified, located and sized and the peri-urethral fibrosis was patently evidenced.

For the dorsal onlay buccal mucosa urethroplasty, the patient is placed in a dorsal lithotomy position, an 8 Fr urethral catheter is inserted and an incision is made just anterior to the urethra with dissection carried down through the periurethral tissue and the urethra is then opened transversally until the upper part of the stricture. A buccal mucosa graft is then harvested, sized on the stricture length. The graft is defated before to be sutured to the urethra opening using 5/0 pds running sutures. There was no postoperative complications and the patients had significantly improved urinary symptoms as well as urine flow rates postoperatively.

CONCLUSION
This video demonstrates the feasability of urethral ultrasound in the evaluation, and of dorsal onlay buccal mucosa graft urethroplasty in the treatment of female urethral stricture. Further clinical studies are needed to assess their possible benefits over existing diagnostic and therapeutic tools available in the management of this rare condition.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** NYU IRB **Helsinki** Yes **Informed Consent** Yes

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ROBOTIC ASSISTED LAPAROSCOPIC APICAL SUSPENSION (RALAS): DESCRIPTION OF THE SPIRAL TECHNIQUE

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INTRODUCTION
In 2008, the large number of reported adverse events with transvaginal placement of mesh to correct pelvic organ prolapse (POP) prompted the FDA to issue a public health notification outlining the potential serious consequences of such placement. The objective of this video was to describe our no mesh technique and steps of robotic assisted laparoscopic apical suspension (RALAS) in the treatment of patients with symptomatic apical vaginal prolapse.

DESIGN
Evaluation of our robotic no mesh surgical technique is described. Informed consent was obtained and discussed with the patient. 70-year-old Caucasian woman, gravida 3, para 2 had symptomatic POP apical/anterior stage III. Upon pelvic ultrasound evaluation, the uterus was small and adnexa appeared normal bilaterally. She failed pessaries and is sexually active. The most relevant complaints were vaginal bulging and pressure. She denied any urinary incontinence. During the surgery we used 1) 3-0, V-Loc™ (Covidien) and we reinforced these absorbable sutures with 2) 2-0, GORE-TEX® Suture (Gore Medical). The da Vinci Si Surgical System was used with 4 arms and 5 trocars configuration, docking on the left side of the patient.

RESULTS
On the right/left apical support, we used V-Loc and Gore-Tex. These provided the initial 2 points suspension on the uterosacral ligaments (USL). We like to attach the left USL to the right USL. We then developed the space between the bladder and vagina and reinforced the pubocervical fascia with V-loc suture plications. The following 2 anterior apical support sutures are taken from the vagina to the transversalis

fascia on the anterior abdominal wall. We hid these sutures behind the peritoneum covering the bladder. The tension of these anterior sutures were maintained with Hem-o-lock (TeleFlex) and LAPRA-TY (Ethicon). Now using the spiral technique, we secured the suture through the posterior and anterior abdominal muscle fascia going initially from inside to outside and then back inside using a Carter-Thomason laparoscopic port closure system. This may provide a better long-term support for the anterior apical compartment.

CONCLUSION

In our opinion, RALAS-4 may represent an alternative to robotic or laparoscopic sacrocolpopexy. This new approach simulates the natural 4 point support given by USL and cardinal ligaments, with the additional benefit of no mesh and no dissection on the sacral promontory. With this technique, we are chasing the pelvic floor trifecta: no mesh, no complications, and good long-term anatomic support.

Funding None **Clinical Trial** No **Subjects** None **Ethics not Req'd** I\

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FEMALE ARTIFICIAL URINARY SPHINCTER IMPLANTATION: A NON-BLIND LAPAROSCOPIC APPROACH

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INTRODUCTION

The classical technique of laparoscopic artificial urinary sphincter (AUS) implantation in not widely spread because of its complexity. There is a blind dissection of the dorsal side of the bladder neck, which increase the risk of erosion and cuff migration. We propose to start surgery with vesicovaginal space dissection, which allows to place the cuff around the bladder neck under direct view.

DESIGN

We describe the technique of AUS implantation with the vesicovaginal approach in a 75-y.o woman who underwent a sling implantation in 2010. She did not recover complete continence, showed incontinence with minimum movements, and a negative Ulmsten test. Cystoscopy revealed no sling extrusion and videourodynamics suggested intrinsic sphincter deficiency.

The patient is placed in a 30^0 Trendelenburg position and surgery is performed using a transperitoneal approach. First, the vesicovaginal space is created. A vaginal valve is essential in order to identify the anterior vaginal wall. Dissection is extended distally until the dorsal side of the bladder neck is identified. Now, the peritoneum is opened in its anterior part and the dissection is extended at both lateral sides of the bladder till the endopelvic fascia is reached. At this moment, we are able to perform the main step of the procedure, which is connecting the vesicovaginal space to the laterovesical spaces. Then, the anterior side of the bladder neck is dissected trying to preserve the maximum length of pubovesical ligament.The bladder neck diameter is measured and a cystoscopy is performed to check that the bladder neck was not injured. The cuff is placed and the pressure-regulating balloon is inserted. A 2 cm left suprapubic incision is made and a 5 mm port is placed through it. Then, the balloon and the cuff tubes are externalised. A subcutaneous passage is created from the suprapubic incision to the ipsilateral labia majora where the pump is placed. The balloon is inflated with 23 cc of saline and the components are connected. Finally, peritoneum is closed with a barbed suture. No drain is left in place. AUS is left deactivated and will be activated at 6 weeks after surgery.

RESULTS

Operative time was 140 minutes. No intraoperative complications occurred. Bladder catheter was removed 72 hours after surgery. The patient had a post-void residual volume of 100 cc, which was managed conservatively. Hospital stay was 72 hours. After six months the patient is pad-free and satisfaction with the procedure was 9/10.

CONCLUSION

Laparoscopy provides a magnified view, which allows a better dissection of the urethrovaginal space and the bladder neck. And most importantly, the dissection of the dorsal side of the bladder neck similarly to laparoscopic sacrocolpopexy, allows a non-blind implantation of the cuff which could avoid potential complications. This might allow the AUS implantation technique to become more reproducible.

Funding Non **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Is a Video **Helsinki** not Req'd Is a Video **Informed Consent** Yes

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LAPAROSCOPIC TRANSVESICAL EXCISION AND RECONSTRUCTION IN THE MANAGEMENT OF ANTERIOR COLPORRHAPHY MESH EROSION AND STONES AROUND THE BLADDER NECK: VIDEO ABSTRACT

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INTRODUCTION

Perforation of the bladder or urethra and erosion of the mesh after cystocele repair surgery are not uncommon and have potentially serious complications. Traditionally, surgical

management of such complications has involved excision of the mesh using either a transurethral approach or open surgery. However, incomplete excision can cause erosion, stone recurrence, and bladder wall scarring. In this video, we present our experience of laparoscopic transvesical surgery for exposed mesh and stone.

DESIGN

Patient was placed in the lithotomy position under general anesthesia and a 30° operating cystoscope was inserted under direct vision. After filling the bladder with 300 mL normal saline, a 5-mm VersaStepTM bladeless trocar was placed 2 cm above the pubic symphysis. Two more 5-mm trocars were placed bilaterally at 3-cm intervals from the initial trocar site. The pneumovesicum state was maintained at 8–12 mmHg and a 5-mm telescope was introduced. Using a curved dissector and curved Mayo scissors, the exposed mesh was mobilized from the paravesical tissue and removed, including the muscle and mucosa layer. Interrupted 4-0 Vicryl sutures were used to close the defect in a single layer. To localize the ureteral orifice, intravenous Indigo Carmine was used. The bladder stones were removed through the urethra using a stone basket, guided using a ureteral stent pusher.

RESULTS

Total operation time was 55 min and the Foley catheter was removed 5 days after surgery.

CONCLUSION

Excellent visualization of mesh exposure and ureteral orifice was possible in laparoscopic transvesical surgery, and reconstruction with interrupted sutures, including the mucosa and muscle layer was able to be achieved.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Korea University Ansan Hosiptal institutional review board **Helsinki** Yes **Informed Consent** No

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LAPAROSCOPIC APPROACH OF ENTEROCELE AND UTERINE PROLAPSE REPAIR USING NATIVE TISSUE

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INTRODUCTION

After giving birth a resulting uterine prolapse with a concomitant enterocele can lead to decreased quality of life and big discomfort.

Especially in young women with pelvic floor disorder native tissue repair with uterus-sparing surgery is crucial. But it might also be of interest in older patients wanting to retain their uterus and avoiding a change of their physical integrity.

To restore the pelvic support the peritoneum alone is not a sufficient structure. The best results can be obtained by obliteration of the pouch of Douglas combined with a support of the uterus. In our case this was achieved by native tissue repair with uterosacral ligament fixation.

DESIGN

Our video presents the case of a 28-year-old patient. One year before she had a caesarean section and three years before she had had a spontaneous delivery with damage of the musculus levator ani on the right side. Up to now she has been suffering from prolapse symptoms because of pelvic floor defect with an enterocele formation and uterine prolapse, POP-Q stage II. Preoperatively MRI defecography confirmed the defect.

RESULTS

Laparoscopy was performed using an umbilical port to insert the laparoscope and three other ports for the instruments. The laparoscopic view showed a deep and wide pouch of Douglas with a lack of prominent uterosacral ligaments. To obliterate the pouch of Douglas three non-absorbable 2-0 polyester sutures were placed through the right uterosacral ligament including the rectosigmoid serosa and incorporation of the posterior vaginal wall and the cervix. These three stitches must not be too close and before knotting the threads they were temporarily placed at the right abdominal wall. Then another two sutures were made in the same way but starting on the left side. These two stitches included the left uterosacral ligament, the rectosigmoid serosa, the posterior vaginal wall and the cervix on the left. Again after a temporary placement of the threads at the left abdominal wall all the stitches were knotted.

The result was the desired obliteration of the pouch of Douglas combined with surgery to support the uterus using a uterosacral ligament hysteropexy. Additionally it is often necessary to open the retroperitoneal space on both sides of the rectum to reduce the peritoneal tension to avoid ureteral kinking. A final control rectoscopy is mandatory to exclude a stenosis of the rectum. In our patient the postoperative period was uneventful with a normal bowel function and definite improvement of quality of life.

CONCLUSION

The result of the above mentioned pelvic reconstructive surgery leads to sufficient pelvic support by native tissue repair without implantation of mesh. Uterus-sparing methods of reconstructive pelvic surgery fulfil the desire of uterus preservation in women of all ages. To prevent a recurrent prolapse it is important to maintain the normal vaginal axis.

We consider the combination of obliteration of the pouch of Douglas with uterosacral ligament hysteropexy as an optimal repair of a uterine prolapse combined with posterior vaginal wall prolapse, particularly an enterocele.

REFERENCES
1. Paraiso MF, Falcone T, Walters MD. Laparoscopic surgery for enterocoele, vaginal apex prolapse and rectocele. Int Urogynecol J 1999; 10: 223-229
2. Restaino S, Rossini C, Minelli A, Santarelli A, Sambia G, Fanfani F. Laparoscopic approach for Shull repair of pelvic floor defects. J Minim Invasive Gynecology 2017; Dec 28. pii: S2553-4650 (17)31357-2

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** This is a case report **Helsinki** Yes **Informed Consent** Yes

640 www.ics.org/2018/abstract/640

"STANDARDIZED" APICAL FIXATION - LAPAROSCOPIC BILATERAL UTEROSACRAL LIGAMENT REPLACEMENT: DEFINED MATERIAL OF DEFINED SHAPE AT DEFINED FIXATION SITES.

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INTRODUCTION
In contrast to the established gold-standard (sacrocolpopexy, sacrospinous fixation) for apical fixation, the so called cervicosacropexy and vaginosacropexy (laCESA and laVASA) are clearly defined surgical procedures and restore urinary continence. The uterosacral ligaments (USL) are replaced bilaterally with a minimum of material between the cervix / vaginal vault and the sacral vertebra at the level of S1. Since the bony dimensions in the female small pelvis are nearly identical alloplastic tapes of defined lengths (9cm) and shape (width 0.4cm) were used to replace the USL. Therefore, the results are comparable and can be performed identically by different surgeons.

The objective of this study was the implementation of a laparoscopic apical fixation in the treatment of pelvic organ prolapse and urinary incontinence.

DESIGN
In laCESA, subtotal hysterectomy was performed by dissecting the uterus above the origin of the USL at the cervix. In laVASA, the peritoneum over the vaginal vault was opened along the running scar. The polyvinylidene-fluoride (PVDF) ligament-replacement structure was sutured to the cervix or vaginal vault. The peritoneum over the first sacral vertebra (attachment of the USL) was blunt-opened and the USLs were "tunneld" towards cervix/vault on both sides and the PVDF-structure was placed into the peritoneal fold. The PVDF ligament-replacement structure was attached with three titanium helices to the prevertebral fascia of S1 on each side. The peritoneum above the cervix or vaginal vault was closed.

Urinary incontinence symptoms were documented according to validated questionnaires, objective outcome according to POP-Q system.

RESULTS
So far, 160 patients underwent laCESA and laVASA. Median operating time was 89 minutes (32-194min). At 4 months, in 76% and 100% of patients urinary continence and apical prolapse were restored. No mesh erosion appeared.

The advantage of laCESA and laVASA lies in the comprehensible surgical technique (clearly defined technique) and the minimal amount of material used (no polypropylenes).

The possibility of a short operating time and short hospitalisation depict this laparoscopic bilateral USL replacement as one treatment alternative in patients with apical prolapse suffering from UI.

CONCLUSION
The CESA and VASA surgical techniques are techniques to restore apical vaginal prolapse and urinary incontinence as already described. laCESA and laVASA with fixation at physiological landmarks with a minimum of material contributes to the established surgical treatment options for genital prolapse and urinary incontinence.

Funding None **Clinical Trial** No **Subjects** None

641 www.ics.org/2018/abstract/641

LAPAROSCOPIC APPROACH FOR VESICOUTERINE FISTULA: STEPPED TECHNIQUE

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INTRODUCTION
Vesicouterine fistulas (VUF) are the least common type of urogenital fistulas. They may present with vaginal urinary leakage, cyclic hematuria (menouria), amenorrhea or infertility. Spontaneous healing is reported in 5% of cases. We present a video that shows the stepped technique of transperitoneal laparoscopic repair of vesicouterine fistula.

DESIGN
Laparoscopic repair was performed 3 months after cesarean section in 3 female patients that presented with cyclic hematuria and vaginal urinary leakage. MRI and cystoscopy revealed the vesicouterine fistula. The fistula was repaired through laparoscopic transperitoneal extravesical approach using 4 ports and following the next steps: 1. Positioning: The patient was placed in lithotomy position while also in an extreme Trendelenburg position. 2. Cystoscopy: the ureters and the fistula tract are tutorized using simple ureter-

al catheters and an hydrophilic guidewire. 3. Port position: Pneumoperitoneum was established using a Veress needle in the umbilical region, and a primary 12 mm port was inserted. Another 5 mm port was inserted exactly between the right superior iliac spine and the umbilicus. Two other 5-mm ports were established under laparoscopic guidance in the left iliac fossa and hypogastrium for bladder mobilization. 4. Fistula Tract Dissection: the fistula tract was identified and completely excised using sharp dissection and monopolar energy. Limited cystotomy was performed, and the specific sites of the fistula and the ureteral meatus were identified. The edge of the bladder was excised at the site of fistulas tract. 5. Bladder closure: The urinary bladder was closed in a double layer using single 3-0 barbed continuous suture. 6. Uterine cervix closure: uterine isthmus is tutorized with an hysterometer and the closed with continuous single 2-0 vicryl suture. 7. Omental Flap Interposition: An omental flap was interposed between the bladder and the uterus. 8. End of surgery: Blake like drainage was positioned in the vesicouterine space.

RESULTS
Mean operative time was 150 minutes. Mean blood loss was than 100 ml. There were no intraoperative or postoperative complications. Mean hospital stay was 2 days. Bladder catheter was removed after 14 days in both cases. Clinically, both patients had no more symptoms after 10 months follow up.

CONCLUSION
Laparoscopic repair appears to be a viable alternative for surgeons experienced with laparoscopic suturing techniques. Both ureteral and fistula catheterization and hysterometer insertion, are maneuvers that make the procedure easier and safer.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Patient´s identity is not revealed and she approved to be filmed in the imformed consent form **Helsinki** Yes **Informed Consent** Yes

642 www.ics.org/2018/abstract/642

STARTOPEE: DEVELOPING TECHNOLOGICAL TOOL FOR PEOPLE WHO LIVE AND LIVE WITH INCONTINENCE

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INTRODUCTION
Despite the advances in the area with different approaches to the treatment of incontinence, the impact on the quality of life of people living and living with incontinence remains a challenge for the public health system. The perception of health remains compromised due to the daily disorders secondary to incontinence. However, our hypothesis is that assistive technology strategies can be facilitators to improve the quality of life and well being of people living with incontinence. Our aim was to create a tool to improve the accessibility and social reintegration of people who live and live with incontinence.

DESIGN
Technological development study registered in a technology-based incubator of its origin country in startup format. We proposed 7 steps: (1) conceptual modeling, (2) market analyze, (3) smoke test, (4) validation process, followed by (5) navigation project, (6) design and (7) implementation. The study was registered in the Research Ethics Committee for validation testing.

RESULTS
Conceptual modeling tests were performed by investigating the impact of incontinence on the health perception of the target population. It was observed that emotional and social impact overlaps physical and functional complaints. Among the complaints presented, it was observed the social and family isolation, and the difficulty of access to the bathroom as limiting factors for the conviviality, therefore, the bathroom use strategy was chosen as the central theme of the proposal. Accordingly, the established strategy was the development of a public and private bathroom locator application, which was named StarToPee. Thus, the navigation project was proposed with the following interfaces: (a) geolocalization, (b) classification of the type of bathroom: public/private, individual/collective, family, infant, unisex, adapted for people with special needs, with shower, among others, (c) facilities and hygiene care: cleaning, toilet paper availability, bag holder, pad/tampons dispenser, among others. The design and implementation took place through integration with google platform, with implementation in web format and in the platforms IOS and Android.

StarToPee improves the quality of life of people living with incontinence, besides being of interest to people who intend to include care in their travel routes that promote well-being, quality and hygiene. StarToPee classifies bathrooms as the type and conditions of accessibility, comfort and hygiene; presents to its users the facilities found in each environment, which can be inserted by the user; has the capacity for geolocation, favoring the routes establishment. During the tests performed in the pre-incubation period, the application proved to be acceptable, of great interest by the population and extremely useful for those living and living with incontinence. The process of validation and experimentation can still add value in the improvement of the proposal.

CONCLUSION
StarToPee is a bathroom locator application that aims to improve the quality of life of the population living and living with incontinence, as well as proposing wellness and comfort for its users.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Federal University of Alfenas **Helsinki** Yes **Informed Consent** Yes

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DO ABNORMAL TOILETING BEHAVIORS CONTRIBUTE TO WORSE URINARY SYMPTOMS IN WOMEN?

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HYPOTHESIS / AIMS OF STUDY

Lower urinary tract symptoms are common in women and presumably related to four recognized domains of toileting behaviors, including 1) place, 2) timing, 3) position, and 4) style (1). However, little is still known about the associations between abnormal or dysfunctional toileting behaviors and urinary symptoms. Our aim was to investigate our hypothesis that increased lower urinary tract symptoms, specifically overactive bladder (OAB), are correlated with dysfunctional toileting behaviors in a community-based sample of women.

STUDY DESIGN, MATERIALS AND METHODS

In this cross-sectional study, we recruited community women to complete online, validated questionnaires, including the Toileting Behavior Scale (TBS) and International Consultation on Incontinence Questionnaire-Overactive bladder (ICIQ-OAB). Toileting behavior questions were grouped by place preference, premature voiding (voiding without the need to urinate), delayed voiding, and straining to void. Pearson correlation coefficient was computed to assess the relationship between ICIQ-OAB and toileting behavior scores. Linear regression modeling was performed to analyze the effects of toileting behaviors on OAB, adjusting for age.

RESULTS

A total of 6,695 women aged 18-89 (mean: 41.4 ± 15.1) completed the questionnaires. Ninety-four percent (n=6,282) of women empty their bladder before leaving home at least sometimes, with 12.7% (n=853) always avoiding public toilets. Delaying voiding as long as possible at least sometimes was reported by 53% (n=3,552). To completely empty the bladder, straining to void at least sometimes was reported by 31.4% (n=2,099). There were significant positive correlations between ICIQ-OAB score and all toileting behavior scores (place preference: r= 0.129, p<0.0001; premature voiding: r=0.343, p<0.001; delayed voiding: r=0.07, p<0.0001; straining to void: r=0.221, p<0.0001). Figure 1 displays the correlation between OAB and premature voiding. After adjusting for age, all toileting behaviors were associated with higher ICIQ-OAB scores (Table 1).

INTERPRETATION OF RESULTS

This work demonstrates the first association of toileting behaviors with overactive bladder in adult women. Overall, there was a positive correlation between OAB and toileting behaviors. Worsening severity of OAB symptoms correlated with more abnormal toileting behaviors.

CONCLUDING MESSAGE

Nearly all women in our sample endorsed dysfunctional toileting behaviors with voiding. There was significant correlation of toileting behaviors and lower urinary tract symptoms. Further exploration on the effects of toileting behaviors on the development of worsening of lower urinary tract symptoms in adult women is needed.

FIGURE 1

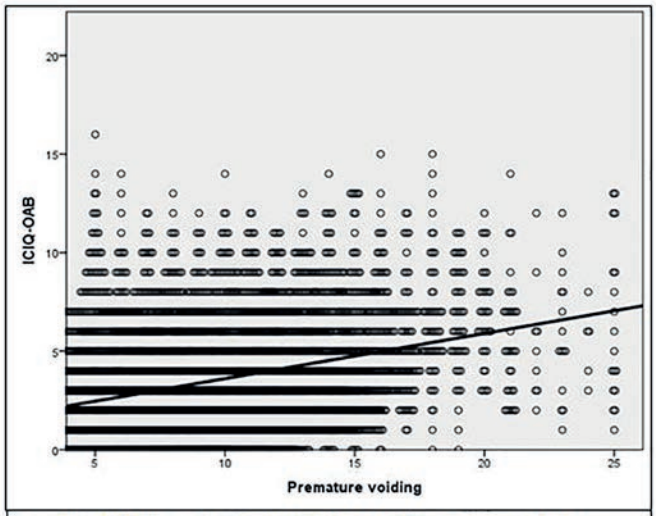

Figure 1. Association between ICIQ-OAB and premature voiding scores showing significant correlation between increasing ICIQ-OAB score and premature voiding (Pearson coefficient r=0.343, p<0.0001).

FIGURE 2

Table 1. Linear regression model for ICIQ-OAB and toileting behaviors

	Coefficient	Std Error	95% CI	P value
Place preference	0.028	0.009	0.011, 0.045	<0.0001
Premature voiding	0.188	0.008	0.173, 0.202	<0.0001
Delayed voiding	0.048	0.011	0.026, 0.069	<0.0001
Straining to void	0.099	0.007	0.085, 0.113	<0.0001

REFERENCES

1. Wang K and Palmer MH. Women's toileting behavior related to urinary elimination concept analysis. J Adv Nurs 2010;66:1874-1884.

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TRENDS IN THE UTILIZATION OF THIRD LINE TREATMENT MODALITIES FOR OVERACTIVE BLADDER

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HYPOTHESIS / AIMS OF STUDY

The purpose of this study is to investigate current trends in third line treatments for Overactive Bladder (OAB) including sacral neuromodulation (NM), percutaneous tibial nerve stimulation (PTNS) and chemodenervation (CD). There is a paucity of data regarding the progression of patients to third line therapy and is reported to be highly variable among providers(1). A more complete knowledge of urologists characteristics associated with usage of these modalities may highlight discrepancies between providers.

STUDY DESIGN, MATERIALS AND METHODS

Data on third line OAB procedures performed between 2010 and 2016 by urologists were obtained from The American Board of Urology annualized case logs. Non-pediatric urologists applying for initial certification, recertification and female pelvic medicine and reconstructive surgery (FPMRS) were included. CPT codes 64581 (NM), 64561 (NM), 64553 (PTNS), 64566 (PTNS) and 52287 (CD) were queried. Summary statistics characterizing trends in the utilization of these procedures were calculated. Statistical analysis was then performed to identify surgeon characteristics that predicted the number of procedures performed using analysis of variance. Characteristics considered included gender, years in practice, specialty, practice size, practice type, certification type, and practice location.

RESULTS

Usage of third line therapies has increased from 1,822 in 2010 to a peak of 6,143 in 2013. NM cases logged peaked in 2013, the year of FDA approval for CD, and has since been declining. CD procedures increased each year after 2013, until declining in 2016 (Table 1). From 2010 to 2016, 5,499 case logs were submitted with 1,224 urologists logging a total of 26,874 NM and/or CD procedures, while only two urologists logged PTNS cases. Practitioners performed an average of 13.35 NM and 4.22 CD procedures per case log. Women performed more CD procedures than men (5.97 vs. 3.79, p=.001). FMPRS physicians performed significantly more procedures than physicians in all other specialty categories (p<.001). Similarly, urologists submitting cases for FMPRS certification performed more procedures than those submitting for initial certification or recertification (all comparisons $p < .001$). The majority of third line OAB therapies are being performed in large urban centers where >1,000,000 patients are served (33.4%, 41.5%, and 35.3% of NM, CD, and total cases) and in private practices (50.8%, 51.2%, and 50.9% of NM, CD, and total cases). Among the eight regions outlined by the American Urological Association, the Southeastern region had the most activity with respect to third line OAB procedures, containing 25.8% of urologists who submitted these cases and 26.4%, 23.6% and 25.8% of NM, CD, and total cases performed respectively. On a per-urologist bases, North Central urologists perform the most NM (16.23 cases/urologist), Northeastern urologists perform the most CD (8.45 cases/urologist), and North Central urologists perform the most total cases (20.69 cases/urologist). ANOVA revealed that region was predictive of variation in the number of NM and total cases performed, but not for the number of CD procedures performed.

INTERPRETATION OF RESULTS

Third line therapies have increased considerably in the past 6 years. The rapid increase in number of CD procedures was inverse to the change in the number of NM cases. Comparison of Stage 1 to PNE procedures remained similar throughout time, suggesting little change to practice patterns over the years. PTNS procedures were likely not logged due to only recent insurance coverage or may not have been submitted since it is not required for credentialing. Overall, neuromodulation and chemodenervation are being utilized more commonly by urologists, specifically those FPMRS certified, re-certifying physicians and in specific regions.

CONCLUDING MESSAGE

Our study summarizes current trends and utilization patterns of tertiary OAB treatments. The results highlight differences in usage between gender, subspecialty, size of practice area, practice setting, certification status, and practice region suggesting the need for additional research as to why certain practitioners are more likely to perform certain procedures. Only 22% of urologists submitting case logs reported the use of one or more of these procedures for this highly prevalent condition. The majority of patients with OAB do not or cannot adhere to medical therapy, and these effective treatments may be underutilized in the large OAB population.

FIGURE 1

All Practioner Case Logs from 2010-2016
Total Number of Practioners (and Percentage of Total) that Submitted Cases for:

Total Case Logs	Third Line Procedures	CD	PNE	Stage 1	Combined SNM
5499	1224 (24%)	501 (9%)	659 (12%)	779 (14%)	889 (16%)

Total Procedures Logged by Year for Each Specific Procedure

Year	CD	PNE	Stage 1	Combined SNM	Total Third line
2010	-	902	920	1822	1822
2011	-	1290	1164	2454	2454
2012	-	1596	1244	2840	2840
2013	18	2810	3315	6125	6143
2014	1854	1723	1763	3486	5340
2015	3123	1194	1629	2823	5946
2016	1455	402	472	874	2329

REFERENCES

1. Moskowitz, D., Adelstein, S. A., Lucioni, A., Lee, U. J. & Kobashi, K. C. Use of Third Line Therapy for Overactive Bladder in a Practice with Multiple Subspecialty Providers-Are We Doing Enough? J. Urol. (2017). doi:10.1016/j.juro.2017.09.102

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645 www.ics.org/2018/abstract/645

THE EFFECTIVENESS OF NURSE-DELIVERED BOTULINUM TOXIN-A INJECTIONS WITH FLEXIBLE CYSTOSCOPY UNDER LOCAL ANAESTHETIC TO TREAT FEMALE IDIOPATHIC OVERACTIVE BLADDER.

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HYPOTHESIS / AIMS OF STUDY

Botulinum toxin A (BoNT-A) improves overactive bladder (OAB) by inhibiting the release of acetylcholine at the neuromuscular junction, thus causing a temporary paralysis. The effects are reversible, hence repeat injections are usually required.

There is paucity of data in the literature regarding the effectiveness, and acceptability of BoNT-A with flexible cystoscopy under local anaesthetic in women with idiopathic OAB.

The objective of this study was to evaluate the effectiveness, safety and acceptability of nurse-delivered intradetrusor botulinum toxin A (BoNT-A) injections for the treatment of refractory female idiopathic OAB within the outpatient setting using a flexible cystoscope under local anaesthetic.

STUDY DESIGN, MATERIALS AND METHODS

Prospective cohort study of 41 consecutive women with idiopathic OAB who had not responded to treatment with at least two antimuscarinics and bladder training, and who had urodynamic confirmation of the diagnosis.

At enrolment, participants completed the electronic Patient Assessment Questionnaire (ePAQ) and a 3-day bladder diary.

They received 200 IU of BoNT-A injected into the bladder in 20 injection sites, avoiding the trigone, using a flexible cystoscope (Storz flexible video-urethroscope, 6.5 F; needle Laborie DIS201 inje TAK adjustable tip needle, 4.8F, 23G) under local anaesthesia (11 ml gel of Lidocaine hydrochloride 2% with Chlorhexidine gluconate 0.05% - Instillagel), which was administered into the urethra prior to cystoscopy.

After treatment, each participant completed a pain visual analogue scale (VAS) and a patient satisfaction questionnaire. Two weeks after treatment they had an assessment of voiding with uroflowmetry and post-void residual (PVR) measurement. Follow up was carried out at 6 months. The post-operative evaluation included completion of the ePAQ questionnaire, a 3-day bladder diary and requirement of CISC.

The primary outcome was change in OAB symptoms as determined by the scores in the OAB item on the urinary domain of the ePAQ questionnaire.

The secondary outcomes included rate of voiding dysfunction, determined by the need to self-catheterise at 6 months; tolerability, determined by a pain visual analogue scale (VAS); changes in the 3-day bladder diary and patient satisfaction.

Changes in the primary outcome (scores in the OAB domain of the ePAQ questionnaire) over time were assessed descriptively (means, median, standard deviations etc.) and inferentially using the paired sample t-test or Wilcoxon signed rank test depending on the distribution of the data.

An a priori power analysis indicated that complete records on a minimum of n = 35 women would be needed in order to obtain 80 percent power (beta = 0.20) in a two-sided test using standard levels of nominal significance (alpha = 0.05) assuming a medium effect size (Cohen's d = 0.5). Forty women were planned to be recruited to allow for a 15% drop out rate.

RESULTS

41 women completed the study. The mean age was 53.4 years (SD 10.6, range 33-81). The mean body mass index (BMI) was 31.56 kg/m2 (SD 6.19, range 22-44).

There was a statistically significant reduction in the ePAQ OAB score after treatment [median (IQR), pre 58 (25); post 33 (45) $P<0.001$].

The rate of voiding dysfunction following treatment, as determined by the need for CISC at 6 months, based on a post-void residual greater than 100 ml, was 24.3% (10/41).

Bladder diary data showed a slight non-significant reduction in urinary frequency [median (IQR), pre 10 (5); post 8 (4)]; as well as an increase in the voided volume (ml) [average (SD), pre 166 (64); post 228 (100) $P=0.01$] and post-void residual (ml) [average (SD), pre 48 (63); post 116 (130) $P=0.02$].

The procedure was well tolerated [median (IQR) VAS 4.5 (4)]. Only 7 participants scored the pain at 6 or more.

Participants completed an un-validated patient satisfaction questionnaire at the end of the study. All participants would have the procedure again; and 40/41 (98%) reported that they would recommend the procedure to a friend.

INTERPRETATION OF RESULTS

This is the first study that reports on the effectiveness and tolerability of a nurse-delivered service of BoNT-A injections for the treatment of female idiopathic OAB in an ambulatory setting using local anaesthetic.

The results show that such a service is effective, well tolerated and acceptable to women.

The effectiveness of BoNT-A in OAB has been previously determined [1]. However many studies have used various types of anaesthetic (within the same study) including none, local anaesthetic, sedation or general anaesthetic; and have used either rigid or flexible cystoscopy accordingly; most included participants with neurogenic bladder, and left the decision as to whether any anaesthetic was required to the treating clinician, based on the degree of bladder sensation for each participant.

Previous studies that have used only flexible cystoscopy under local anaesthetic included either participants with neurogenic bladder exclusively or a mixture of participants with idiopathic and neurogenic bladder.

To our knowledge, the only other study focusing on women with idiopathic OAB, that used local anaesthetic and flexible cystoscopy, was stopped early due to a higher than expected rate of large post-void residual and urinary tract infections [2].

There is no agreement in the literature with regards to the definition of voiding dysfunction. Some studies define it as a PVR of 50 ml, some use 100 ml, and some define it as a PVR greater than 50% of the voided volume. In our unit, we use 100 ml as the cut off for recommending that women do CISC, and this was the criteria used for the study. The rate of voiding dysfunction is in keeping with that reported in the literature.

We chose to use ePAQ for the study, as this is the questionnaire routinely used in clinical practice in our unit. To our knowledge, the minimally important difference (MID) for ePAQ has not been determined, and is therefore unclear as yet whether the statistical significance found in this study translates clinically.

CONCLUDING MESSAGE

Nurse-delivered BoNT-A injections into the bladder via flexible cystoscopy under local anaesthetic in women with idiopathic OAB is effective and well tolerated.

REFERENCES

1. Tincello DG, Kenyon S, Abrams KR, Mayne C, Toozs-Hobson P, Taylor D, et al (2012) Botulinum toxin A versus placebo for refractory detrusor overactivity in women: a randomized, blinded, placebo controlled trial of 240 women (the RELAX study). Eur Urol 62:507-14
2. Brubaker L, Ritcher H, Visco A, et al (2008) Refractory idiopathic urge urinary incontinence and botulinum A injection. J Urol; 180:217-22

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Research **Ethics Committee** North West – Liverpool East (NRES), reference number 14/NW/0209 **Helsinki** Yes **Informed Consent** Yes

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A SINGLE PROCEDURE OF SELECTIVE BLADDER DENERVATION (SBD) OF THE TRIGONE IN PATIENTS WITH OVERACTIVE BLADDER (OAB) APPEARS TO RESULT IN SYMPTOM IMPROVEMENT FOR 12 MONTHS

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HYPOTHESIS / AIMS OF STUDY

To determine

1. If SBD of the trigone results in improvement of OAB symptoms

2. Durability and safety profile of SBD treatment

STUDY DESIGN, MATERIALS AND METHODS

Women with OAB who had failed medical therapy were recruited for this multicenter multinational study using a novel treatment with RF energy to selectively ablate the nerve rich layers of the deep detrusor and adventitial space below the trigone while sparing the bladder mucosa and surrounding pelvic viscera. Patients with ≥3 urgency urinary incontinence (UUI) episodes in 3 days and ≥8 voluntary voids per 24h were eligible. Normal lower urinary tract anatomy was confirmed based on history, physical examination, renal and bladder ultrasound and pre-procedure cystoscopy. After washout of oral OAB medications, OAB diagnosis was confirmed by history and 3-day voiding diary which included the patient perception of intensity of urgency scale (PPIUS) for each void. All patients had prophylactic antibiotics and either a general anesthetic or conscious sedation. SBD treatment consisted of cystoscopically guided 60 sec ablations repeated to cover the span of the trigone (average of 4 ablations per patient). The optimal technique and ablation parameters for SBD were developed in a series of ovine ex-vivo and in-vivo experiments which have been previously reported (in press). A visual analogue scale was used to assess post procedure pain at 4h prior to discharge on the same day. Pre- and post-procedure assessment at 4, 12, 26 and 52 weeks consisted of 3-day diaries, OABq SF and Kings Health Questionnaire (KHQ) and follow up capture of treatment benefit scale (TBS) and adverse events (AE) adjudicated by an independent committee. Total Urgency and Frequency Score (TUFS) per 24h was computed by summing the urgency score of every void and dividing by the number of days of diary capture (1).

RESULTS

Of the 35 patients enrolled, 18 have completed 12-month follow up to date. Efficacy data is presented only on those patients who remained in the study, and had diary data available and who had not had additional therapy (see Table). The average age and duration of OAB was 66.1±8.7 and 9.8±7.7 years respectively. Some patients (n=8) had

previously failed other 3rd line therapies (Botox: 4, SNM 2, PTNS 2). Procedure related adjudicated AEs were all noted within 4 weeks of treatment and the most common was UTI that occurred in 4 patients (11%), all other AEs were single occurrences (<3%). Of note, the treatment did not result in urinary retention requiring catheterization. One device and procedure related SAE occurred in a patient with an undiagnosed ureterocele which after the procedure resulted in transient ureteric obstruction, hydronephrosis, and pyelonephritis that was treated with antibiotics and a double J stent for 10 weeks. Upon removal of the stent, the obstruction was resolved and the patient continues to have improvement of her OAB symptoms.

INTERPRETATION OF RESULTS

These data suggest that SBD is well tolerated and results in durable improvement in OAB symptoms without interfering with normal bladder function. The effect of the procedure appears to last for at least 12 months, and possibly longer.

In this uncontrolled study, a reduction in TUFS measure mitigates against the possibility of defensive voiding resulting in a reduction of urgency and UUI episodes.

The results support the neurogenic hypothesis for the etiology of OAB and suggest that the trigone is an appropriate area of focus for OAB treatments.

CONCLUDING MESSAGE

1. SBD appears to be effective in reducing the cardinal symptoms of OAB: urgency and urgency incontinence.

2. The procedure was well tolerated and appears to be safe in the absence of lower urinary tract abnormalities.

3. A single treatment appears to have durable efficacy without long term side effects.

4. A larger sham controlled study is needed to confirm these results.

5. The results support a neurogenic etiology of OAB.

FIGURE 1

Parameter	Baseline	4 weeks	12 weeks	6 months	12 months
	Mean ± SD (n)	Δ Mean ± SD (n) p value	Δ Mean ± SD (n) p value	Δ Mean ± SD (n) p value	Δ Mean ± SD (n) p value
Mean UUI/day	4.5±2.3 (35)	-2.3±2.4 (32) p<0.0001	-2.7±2.4 (33) p<0.0001	-2.6±2.7 (32) p<0.0001	-2.8±2.5 (17) p=0.0004
Mean UI/day	4.5±2.3 (35)	-2.3±2.4 (32) p<0.0001	-2.7±2.4 (33) p<0.0001	-2.6±2.8 (32) p<0.0001	-2.8±2.5 (17) p=0.0004
UI Responder %	-	53.1%	72.7%	68.8%	70.6%
Dry Rate % (UI = 0)	0%	15.6%	15.2%	28.1%	11.8%
Mean Urgency episodes/day	8.7±2.9 (35)	-3.4±3.5 (32) p<0.0001	-4.3±4.1 (33) p<0.0001	-3.9±3.8 (32) p<0.0001	-3.8±3.5 (17) p=0.0003
Mean frequency/day	12.3±2.7 (35)	-1.2±2.5 (32) p=0.0108	-1.2±2.5 (33) p=0.0103	-1.3±3.1 (32) p=0.0206	-0.8±1.9 (17) p=0.1037
Mean nocturia/24h	2.1±1.4 (35)	-0.4±0.8 (32) p=0.0075	-0.4±1.0 (33) p=0.0231	-0.2±1.1 (32) p=0.3833	-0.2±0.7 (17) p=0.2433
TUFS/day	36.5±8.2 (35)	-10.8±10.7 (32) p<0.0001	-12.4±12.3 (33) p<0.0001	-11.2±11.9 (32) p<0.0001	-10.6±9.8 (17) p=0.0004
Mean volume voided per micturition	155.0±53.5 (35)	0.7±29.9 (31) p=0.9039	5.4±37.9 (32) p=0.4292	2.7±41.1 (30) p=0.7182	-15.4±40.2 (17) p=0.1346
TBS Improvement %	-	68.6%	75.8%	74.2%	70.6%

UI: urinary incontinence, UUI: urgency urinary incontinence, UI responders: ≥50% improvement

REFERENCES

1. Chapple et al. Total urgency and frequency score as a measure of urgency and frequency in overactive bladder and storage lower urinary tract symptoms. BJU Int. 2014; 113: 696–703

Funding Research Grant from Amphora Medical **Clinical Trial** Yes **Registration Number Clinical Trial**s.gov **RCT** No **Subjects** Human **Ethics Committee** WIRB **Helsinki** Yes **Informed Consent** Yes

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UNDERSTANDING THE RELATIONSHIP BETWEEN ANTERIOR VAGINAL COMPARTMENT PROLAPSE AND OVERACTIVE BLADDER

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HYPOTHESIS / AIMS OF STUDY

The relationship between anterior vaginal compartment prolapse and overactive bladder (OAB) symptoms has been stablished in the literature, but data correlating the severity of prolapse with these symptoms are very sparse (1). Published studies only consider the most advanced point of anterior prolapse and do not assess its relationship with urethral position. The anatomy of anterior wall prolapse is defined not only by the most descended point, but also by the possibility of urethral kinging. The Pelvic Organ Quantification (POPQ) system allow us to describe anterior vaginal wall prolapse more correctly. Using both anterior compartment points, we can identify if the is any degree of kinking in the urethra. Obviously, when point Aa reach maximum descent (+3) there is no possibility of kinking, even if point Ba has a greater value. A smaller descent of point Aa com-

bined with a greater one of point Ba raises the possibility of urethral kinking.

The aim of the study was to evaluate if there is any relationship between anterior vaginal compartment anatomy and OAB symptoms in women with prolapse. Our hypothesis is that both urethral kinking and large anterior vaginal compartment prolapse could be associated with an increased risk of OAB.

STUDY DESIGN, MATERIALS AND METHODS

This was a cross-sectional multicentre study including all women with symptomatic anterior compartment prolapse that were evaluated in the pelvic floor units of two different hospitals between May 2015 and September 2017 prior to surgery. Pelvic organ prolapse was described according to the POPQ system. Two gynecologists blinded to symptoms reports performed the examination. Urethral kinking was defined when point Aa was less than + 3 and at least 2 cm higher than point Ba. Symptoms of prolapse and urgency urinary incontinence (UUI) were identified using the validated Spanish version of the Pelvic Floor Distress Inventory short form (PFDI-20). Urinary urgency was identified using the first question of the validated Spanish version of the Bladder Control Self-assessment Questionnaire (B-SAQ). Statistical analysis was done by proportion comparison (Chi-square) and multivariate analysis (multiple logistic regression model).

RESULTS

We included 481 patients with symptomatic anterior compartment prolapse scheduled for surgery. Mean age was 63.2 years (SD:9.7; range:37-86) and mean body mass index (BMI) was 29.8 (SD:5.7; range:16.8-70.4). Of these, 251 (52.2%) reported urinary urgency in the B-SAQ questionnaire and 191 (39.7%) reported UUI in the PFDI-20 questionnaire. Examination of the anterior compartment indicated POPQ stage 2 in 93 (19.3%) patients, stage 3 in 345 (71.7%), stage 4 in 43 (8.9%), and urethral kinking in 173 (36.0%) patients. Maximum urethral descent (point Aa +3) was identified in 86 (17.9%) women. Prolapse examination also identified POPQ stage ≥ 2 in 259 (53.8%) women in the apical compartment and in 157 (32.6%) in the posterior compartment.

The evaluation of the association between urethral kinking and OAB symptoms indicated that patients with this anatomical finding were at greater risk of presenting urinary urgency (OR: 2.29; 95% CI: 1.46-3.57). Patients with urethral kinging were also more at risk for UUI (OR: 1.85; 95% CI: 1.23-2.79). These analyses were adjusted by age, BMI and prolapse in the others compartments as potential confounders (table 1). Maximum anterior prolapse (POPQ stage 4) when compared with POPQ stage 2 was also associated with an increased risk of both OAB (OR: 6.52; 95% CI: 2.43-17.46) and IUU (OR: 3.57; 95% CI: 1.53-8.30): These analyses were also adjusted for potential confounders.

INTERPRETATION OF RESULTS

The pathophysiology of OAB in women with pelvic organ prolapse is still unclear and different theories have been hypothesized (2). Prolapse can cause bladder outlet obstruction, being the most accepted mechanism for developing OAB. Our result shows that patients with some degree of bladder obstruction, represented by urethral kinking, are at greater risk for OAB. Alternatively, two more theories seek to explain the association between large anterior compartment prolapse and OAB. The release of chemical factors due to bladder distension, and urine entering the urethra, open due to traction from a prominent cystocele. Our results also show that women with large anterior vaginal prolapse are more at risk for OAB. Probably, a combination of different pathophysiology mechanisms is necessary to explain the relationship between anterior vaginal prolapse and OAB.

CONCLUDING MESSAGE

In patients with symptomatic anterior compartment prolapse, the identification of urethral kinking and severe anterior compartment prolapse, increase the risk of presenting OAB symptoms.

FIGURE 1

Table 1. Results of the multivariate analysis performed to associate urethral kinking and OAB, adjusted by age, BMI and prolapse in other compartments.

	OAB			Wet OAB / UUI		
	n, %	OR	95% CI	n,%	OR	95% IC
Age		1.03	1.00 – 1.05		1.02	1.00 – 1.04
BMI		0.89	0.85 – 0.92		0.95	0.92 – 0.99
Urethral kinking						
no	131 (42.5)	1		100 (32.5)	1	
yes	120 (69.4)	2.29	1.46 – 3.57	91 (52.6)	1.85	1.23 – 2.79
Apical prolapse						
no	89 (40.1)	1		76 (34.2)	1	
yes	162 (62.5)	1.81	1.18 – 2.78	115 (44.4)	1.17	0.77 – 1.77
Posterior prolapse						
no	187 (57.7)	1		138 (42.6)	1	
yes	64 (40.8)	0.53	0.34 – 0.83	53 (33.8)	0.75	0.49 – 1.15

REFERENCES

1. Espuña-Pons M, Fillol M, Pascual MA, Rebollo P, Mora AM, GISPEM group. Pelvic floor symptoms and severity of pelvic organ prolapse in women seeking care for pelvic floor problems. Europen Journal of Obstetrics and Gynecology and Reproductive Biology 2014; 177; 141-145.
2. de Boer TA, Salvatore S, Cardozo L, Chapple C, Kelleher C, van Kerrebroek P, Kirby MG, Koelbl H, Espuña-Pons M; Milson I, Tubaro A, Wagg A, Vierhout ME. Pelvic organ prolapse and overactive bladder. Neurourol Urodyn 2010; 29: 30-39.

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EFFICACY OF TADALAFIL MONOTHERAPY AND ASSOCIATIONS BETWEEN CHANGES IN SUBJECTIVE OVERACTIVE BLADDER SYMPTOMS AND CHANGES IN OXIDATIVE STRESS IN PATIENTS WITH LOWER URINARY TRACT SYMPTOMS

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HYPOTHESIS / AIMS OF STUDY

Tadalafil (phosphodiesterase type 5 [PDE5]) has many different effects such as smooth muscle relaxation in the prostate and bladder neck, increased vascular flow in the tissues of the lower urinary tract, and inhibition of bladder afferent nerve activity. Thus, it is being widely used in male patients with lower urinary tract symptoms (LUTS) globally.

Recent studies have suggested an association between excessive increase in oxidative stress and LUTS, especially overactive bladder (OAB). Although the mechanisms of action of tadalafil described above may reduce oxidative stress, few studies have reported on tadalafil-derived changes in LUTS, including OAB, and changes in oxidative stress, as well as their associations. Hence, the aim of this present study was to examine the changes in OAB symptoms and oxidative stress with tadalafil monotherapy and assess their associations in male patients with LUTS.

STUDY DESIGN, MATERIALS AND METHODS

This 12-week prospective study was performed at a single institution. The study included male patients with LUTS, who met the criteria for OAB (≥2 points for question 3 [urinary urgency] in the OAB symptom score [OABSS] assessment and ≥3 points for the total score).

We orally administered tadalafil (Zalutia®, Nippon Shinyaku, Kyoto, Japan) at 5 mg once a day to the patients and assessed their symptoms and signs before the administration and at 12 weeks after the administration.

Patients who had already received medication to improve urinary function (e.g., α1-adrenergic receptor blockers, anticholinergic drugs, and 5α-reductase inhibitors) were excluded from this study. In addition, patients who developed apparent neurogenic bladder, those with a prostate volume 30 mL or more, those who had received nitric acid agents, and those who developed severe liver failure and renal dysfunction were excluded from this study.

The OABSS was used for the end-point of subjective symptoms. Objective findings were assessed using uroflowmetry and post-residual urine volume. The changes in oxidative stress were assessed using urinary 8-hydroxy-2'-deoxyguanosine (8-OHdG). For assessing urinary 8-OHdG, the first morning urine sample was used, and the 8-OHdG value was determined using ELISA (New 8-OHdG Check®, Japan Institute for the Control of Aging, Nikken Seil Co., Ltd., Shizuoka, Japan). The value was adjusted for urinary creatinine (Cr) concentration (Cayman Chemical, Ann Arbor, MI, USA).

RESULTS

The study included 29 patients, and their mean age was 71.6 ± 8.1 years old. After tadalafil administration, all items of the OABSS assessment showed significant improvement, and the total OABSS showed significant improvement from 6.8 ± 2.0 points to 3.0 ± 1.9 points ($P < 0.001$). Additionally, the voided volume improved from 111.7 ± 78.8 ml to 163.4 ± 100.2 ml ($P = 0.031$), and the maximum flow rate improved from 8.1 ± 3.6 ml/s to 10.5 ± 5.3 ml/s ($P = 0.008$) after tadalafil treatment. Urinary 8-OHdG/Cr decreased from 12.2 ± 9.7 ng/mg Cr to 7.2 ± 11.3 ng/mg Cr ($P = 0.002$). In patients who showed OAB improvement with tadalafil treatment and did not meet the criteria for OAB after treatment (22 patients, 75.9%), urinary 8-OHdG/Cr significantly decreased from 11.6 ± 8.7 ng/mg Cr to 6.1 ± 10.0 ng/mg Cr ($P = 0.004$). On the other hand, in patients who did not show OAB improvement (7 patients, 24.1%), there was no significant decrease in urinary 8-OHdG/Cr ($P = 0.438$).

INTERPRETATION OF RESULTS

Tadalafil monotherapy for 12 weeks resulted in improvement in OAB symptoms and significant improvement in objective findings of male non-neurogenic OAB patients. In patients who showed disappearance of OAB symptoms, urinary 8-OHdG, as a marker of oxidative stress, showed a significant decrease, suggesting that there were associations between changes in subjective OAB symptoms and changes in oxidative stress.

CONCLUDING MESSAGE

Tadalafil administration treatment may improve LUTS, including OAB, by reducing oxidative stress in male patients.

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EARLY AND CONSISTENT IMPROVEMENTS IN URINARY SYMPTOMS AND QUALITY OF LIFE IN IDIOPATHIC OVERACTIVE BLADDER PATIENTS FOLLOWING REPEAT TREATMENT WITH ONABOTULINUMTOXINA: RESULTS OF A MULTICENTER, RANDOMIZED, PLACEBO-CONTROLLED, PHASE 4 TRIAL

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HYPOTHESIS / AIMS OF STUDY

OnabotulinumtoxinA 100U has been demonstrated to reduce urinary incontinence (UI) and significantly improve quality of life (QOL) in patients with idiopathic overactive bladder (OAB) in 2 large, randomized, placebo-controlled, phase 3 trials [1,2]. However, the time to onset of response, as well as efficacy and safety following repeat treatment, requires further characterization. This randomized, multicenter, placebo-controlled, phase 4 study evaluates the efficacy and safety of onabotulinumtoxinA as early as within 1 week post-treatment and also after retreatment.

STUDY DESIGN, MATERIALS AND METHODS

This phase 4 study enrolled patients with OAB who had experienced ≥3 urgency UI episodes in a 3-day bladder diary and ≥8 micturitions per day. All patients were inadequately managed by an anticholinergic. Patients were randomized 1:1 to receive onabotulinumtoxinA 100U or placebo. Three-day bladder diaries were completed prior to each visit (ie, for week 1, diary entries would have commenced as early as the first 4 days post-treatment). Patients could request and receive retreatment with open-label onabotulinumtoxinA ≥12 weeks after the previous treatment if they met the following criteria: ≥2 urgency UI episodes and ≤1 urgency UI–free day according to a 3-day bladder diary in the week prior to qualification and a post-void residual urine volume <200 mL. Post-treatment assessments following the first treatment at weeks 1 and 12 (primary timepoint) and following the second treatment at week 12 in patients who requested and received retreatment with onabotulinumtoxinA included mean change from baseline in UI episodes/day (co-primary endpoint); proportion of patients who achieved UI reductions of 100% (co-primary endpoint); proportion of patients who achieved UI reductions of ≥50%; and mean changes from baseline in micturition frequency, nocturia, Incontinence-QOL (I-QOL) score, King's Health Questionnaire (KHQ) role and social limitations domains, and International Consultation on Incontinence Questionnaire-UI (ICIQ-UI) score. Adverse events (AEs) and the incidence of clean intermittent catheterization (CIC) were recorded. Efficacy and QOL outcomes were analyzed in the intent-to-treat population (all randomized patients), and the incidence of AEs and CIC use was analyzed in the safety population (all patients who received treatment).

RESULTS

Significant reductions from baseline were seen with onabotulinumtoxinA (n=129) vs placebo (n=125) in UI episodes/day as early as within week 1 post-treatment (least squares [LS] mean: -2.9 vs -2.0, respectively; P=.005) and continued to week 12 (LS mean: -3.5 vs -1.6, respectively; P<.001). Significantly higher proportions of onabotulinumtoxinA-treated patients achieved a 100% reduction in UI episodes/day vs placebo after treatment 1 at weeks 1 (24.2% vs 4.8%; P<.001) and 12 (32.0% vs 7.2%; P<.001). Similarly, more onabotulinumtoxinA-treated patients achieved a ≥50% reduction in UI episodes/day vs placebo after treatment 1 at weeks 1 (59.4% vs 36.0%; P<.001) and 12 (67.2% vs 37.6%; P<.001). Decreases in micturition frequency and nocturia were also seen within 1 week following the first treatment with onabotulinumtoxinA vs placebo that continued to, and were significant at, week 12. The proportions of patients in the onabotulinumtoxinA and placebo groups using no incontinence pads in the past 24 hours at baseline were 23.4% and 19.2%, respectively, and the proportions using no pads post-treatment were 35.2% and 26.2% at week 1 and 46.7% and 31.9% at week 12. Improvements in total I-QOL score with onabotulinumtoxinA were consistently higher than the minimally important difference (10 points) and significantly higher than placebo following treatment 1 at weeks 1 and 12 (14.3 vs 5.6 and 27.1 vs 9.8, respectively; P<.001 for both). Significant improvements were also observed within 1 week following treatment 1 for the other QOL measures (KHQ role and social limitations domains and ICIQ-UI) and were sustained to week 12.

Improvements in urinary symptoms and QOL seen 12 weeks following retreatment with open-label onabotulinumtoxinA were consistent with those seen with onabotulinumtoxinA following treatment 1. The mean reduction in UI episodes/day observed 12 weeks following retreatment in patients receiving onabotulinumtoxinA for the first time and who had received placebo at treatment 1 (n=107) was -4.1, and was -4.0 in those administered onabotulinumtoxinA for a second time (n=88). Following treatment 2, proportions of patients who achieved a 100% reduction in UI episodes/day were similar between those receiving onabotulinumtoxinA for a first or second time (37.4% vs 33.0%, respectively). Following retreatment, the proportions of patients who achieved a ≥50% reduction in UI episodes/day were also similar between patients receiving onabotulinumtoxinA for a first or second time (79.4% vs 69.3%). In addition, improvements observed in micturition frequency and nocturia 12 weeks following retreatment were consistent with those observed following treatment 1 with onabotulinumtoxinA. The proportion of patients using no incontinence pads 12 weeks following retreatment was 55.7% and 48.8% in those receiving onabotulinumtoxinA for the first and second times, respectively. Total I-QOL scores were 35.4 and 33.8 twelve weeks after the second treatment in patients receiving onabotulinumtoxinA

for a first and second time, respectively. There were no unexpected safety signals in the first 12 weeks of either treatment cycle, and urinary tract infection was the most common AE reported. CIC rates for urinary retention only were 6.3% and 0% in onabotulinumtoxinA- and placebo-treated patients, respectively, in the 12 weeks following the first treatment. In the 12 weeks following the second treatment, CIC rates were 10.3% in patients receiving onabotulinumtoxinA for a first time (11/107) and 3.4% in those receiving onabotulinumtoxinA for a second time (3/88).

INTERPRETATION OF RESULTS

In patients with OAB who were inadequately managed by an anticholinergic, a robust early treatment response was observed with onabotulinumtoxinA treatment within 1 week that continued to at least week 12 and was consistent following a second treatment. Improvements were similar to those reported in prior phase 3 randomized controlled clinical trials. In addition, onabotulinumtoxinA-treated patients reported early and sustained decreases in the use of incontinence products and significant improvements on a number of disease-specific QOL measures. There were no new safety signals observed.

CONCLUDING MESSAGE

OnabotulinumtoxinA was well tolerated, and improvements in urinary symptoms and QOL observed with onabotulinumtoxinA were seen as early as within 1 week of treatment. Early improvements were sustained for at least 12 weeks and for at least an additional 12 weeks following retreatment.

REFERENCES

1. Nitti VW, et al. J Urol. 2013;189(6):2186–2193.
2. Chapple C, et al. Eur Urol. 2013;64(2):249–256.

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IS THE ICE WATER TEST ASSOCIATED WITH ANTICHOLINERGIC RESISTANCE IN PATIENTS WITH IDIOPATHIC OVERACTIVE BLADDER?

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HYPOTHESIS / AIMS OF STUDY

The Ice-Water Test (IWT) is a urodynamic test assessing the bladder's response to the infusion of ice-cold water. This test evokes a reflex detrusor contraction in patients with upper, but not with lower motor neuron lesions (1)(2). In this prospective exploratory study, we tested the presence of a bladder cooling reflex (BCR) using the IWT, in patients with Neurogenic Detrusor Overactivity (NDO), Stress-Urinary Incontinence (SUI) and patients with idiopathic OverActive Bladder (iOAB). The primary aim of the study was to determine the presence of a positive IWT in patients with iOAB, NDO and SUI. Secondly, we aimed to investigate whether a positive IWT is associated with responsiveness to anticholinergics in iOAB patients.

STUDY DESIGN, MATERIALS AND METHODS

Patients with NDO, SUI or IOAB planned to undergo a Uro-Dynamic Study (UDS) were prospectively enrolled. After standard UDS, the bladder was emptied by means of spontaneous voiding or catheterization. Subsequently, the bladder was rapidly filled with 60 ml ice-cold saline (0-4°C) for 30 seconds. A positive IWT was defined as the occurrence of a detrusor contraction of 15cm H20 or more (3). The instillation of ice-cold saline was repeated up to 3 times with a break of 30 seconds between each instillation or until the IWT was positive. Furthermore, all patients were asked to fill in the validated Urogenital Distress Inventory (UDI-6) questionnaire to quantify the impact of their urological condition on health-related quality of life.

RESULTS

Sixty-two patients (15 men and 47 women) between 20 and 85 years of age underwent an UDS: Group 1: Patients with NDO: 2 patients with a neural tube defect, 4 paraplegic patients and 1 patient with Parkinson's disease (N=7). Group 2: Patients with Stress Urinary Incontinence (SUI) (N=21). Group 3: Patients with iOAB (N= 34).

All patients with NDO had a positive IWT (100%), whereas only one out of 21 patients with SUI presented a positive IWT (4,8%). Within our study group with iOAB, the IWT was positive in 13 of the 34 patients (38%).

None of the patients in the NDO and SUI groups were using anticholinergics. In contrast, 14 out of 34 patients with iOAB (41%) used anticholinergics at the moment of the UDS. Ten out of the 14 patients (71%) taking anticholinergics had a negative IWT, whereas half of the patients (11/20) not taking anticholinergics showed a negative IWT

(p= 0.30).

The relationship between the result of the IWT and the symptomatic response to anticholinergics could be assessed in 20 out of 34 patients in the iOAB group not taking anticholinergics at the moment of the IWT. Seven out of 8 patients (87.5%) with a positive IWT, showed resistance to anticholinergics, whereas 10 out of 12 patients (83%) with a negative IWT responded well to anticholinergics (p = 0.0045) (Figure I).

The UDI-6 questionnaire was used to divide patients in the iOAB-group in two subgroups, based on severity of urgency and frequency symptoms. 16 out of 34 patients with subjective scores of at least 'moderate' (2 or 3 points) on both questions and a minimal score of 4 points were categorized in the group with severe OAB. Out of these 16 patients, 11 had a positive IWT (69%). The other 16 patients were considered to have limited symptoms (1 or 2 points) on both questions with a maximum score of 3. In this subgroup only 2 out of 16 patients had a positive IWT (13%). This difference was statistically significant with Fisher's exact test

(p = 0.0032).

INTERPRETATION OF RESULTS

An important subgroup of iOAB patients (38%) present with a positive IWT. In contrast in patients with SUI, less than 5%, presents with a positive response. Moreover, a higher proportion of patients with a positive IWT presented with a higher symptom severity score using the UDI-6 questionnaire. These data suggest there might be an OAB subgroup with a distinct pathophysiology that needs a different treatment strategy. Therefore, we correlated the use of and response to anticholinergics with the results of the IWT. In the preliminary study, almost 87% of patients with a positive IWT were resistant to therapy with anticholinergics, in comparison to only 17% in the negative IWT group.

These data suggest that the prescription of multiple anticholinergic agents in iOAB patients with a positive IWT has little chance of succeeding. It seems therefore justified in these patients to consider earlier pharmacotherapeutic alternatives such as mirabegron or more invasive treatment.

CONCLUDING MESSAGE

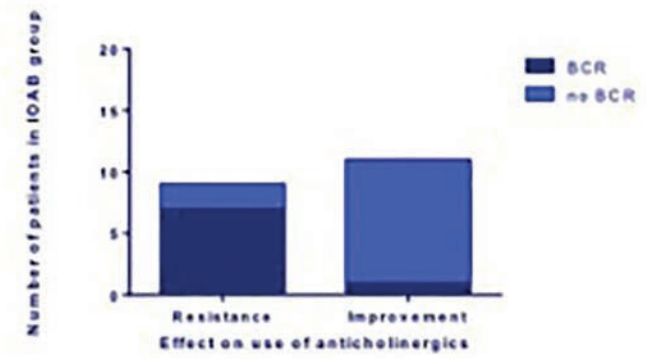
Thirty-eight percent of iOAB patients present with a positive IWT. These patients presented with more severe storage symptoms and were more likely to be resistant to anticholinergics than iOAB patients with a negative IWT. As such, anticholinergics may not be the best option for first line treatment in this patients subgroup.

FIGURE 1

Clinical Presentation	N N° cases	Total DO (%)	DO with BCR (%)	DO (%) No BCR	No BCR (%)	BCR (%)	1st	2nd	3th Times of instillations (%)
NB	7	7(100)	7 (100)	0 (0)	0 (0)	7 (100)	6 (86)	1 (14)	0 (0)
SUI	21	0 (0)	0 (0)	0 (0)	20 (95)	1 (5)	0 (0)	1(100)	0 (0)
IOAB	34	10 (29)	6 (18)	4 (12)	21 (62)	13 (38)	7 (54)	3 (23)	3(23)

Table I. The in vivo bladder cooling reflex in 3 subpopulations.

FIGURE 2



REFERENCES

1. Bors E, Blinn K. Spinal reflex activity from the vesical mucosa in parapl patients. AMA Arch Neurol Psychiatry. 1957.
2. Geirsson G, Lindström S, Fall M, et al. Positive bladder cooling test in neurologically normal young children. The Journal of urology. 1994;151(2):446-8.
3. Geirsson G, Lindström S, Fall M, et al. Pressure,volume and infusion speed criteria for the ice-water test. British journal of urology. 1994; 73, 498-503.

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DO OVERACTIVE BLADDER SYMPTOMS EXHIBIT A GAUSSIAN DISTRIBUTION? IMPLICATIONS FOR REPORTING OF CLINICAL TRIAL DATA

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HYPOTHESIS / AIMS OF STUDY

To assess symptom severity of patients suffering from overactive bladder syndrome (OAB) voiding diary variables urgency, frequency, nocturia and incontinence are recorded at baseline and upon treatment. While some investigators report such variables as means with standard deviations (SD), others report medians with confidence intervals or inter-quartile ranges (IQ). However, this is not a discretionary question but should be determined based on whether

the variable is exhibiting a Gaussian (normal) distribution. Large datasets could clarify this question but have not been reported, particularly based on real-life treatment settings. Therefore, we have examined distribution of OAB symptoms in two large non-interventional studies. Analyses were performed both for baseline symptoms and for treatment-associated changes thereof; the latter was assessed concomitantly as absolute and as relative changes (% reduction).

STUDY DESIGN, MATERIALS AND METHODS

Two non-interventional studies of similar design were analyzed. Neither had specified inclusion or exclusion criteria other than the recommendations from the prescribing information. Rather patients were invited to participate if they started treatment with propiverine ER (30-45 mg/day; dose adjustment during the study was permitted) at the recommendation of their physician. Diary parameters of urgency, frequency, nocturia and incontinence were analyzed at baseline and after 12 weeks of treatment.

For the analysis of baseline symptoms, all patients were included except for those not exhibiting a given symptom at baseline. This exclusion was made because including patients e.g. being continent certainly would have skewed the analysis. Treatment-associated changes were only evaluated in patients with a recorded value after 12 weeks and had started and stayed on the 30 mg/day dose. The latter choice was made as dose and dose adjustment may be a confounding factor, and the 30 mg/day dose group was the largest in both studies.

Normality was tested by the D'Agostino and Pearson K2 omnibus test, which calculates the skewness and kurtosis and the values differ from the Gaussian distribution. Given the size of the underlying studies and the post-hoc character of the analysis, a $P < 0.01$ was defined as statistically significant. As true Gaussian distribution is rarely observed in large datasets, we also assessed whether deviation from a normal distribution was sufficiently substantial to have means and medians differ to a degree deemed to be of clinical relevance.

RESULTS

Studies 1 and 2 included 1335 and 745 patients, respectively, but not all participants reported data for each of the four OAB symptoms in their voiding diary and some did not exhibit one or more of the symptoms. Specific numbers for each symptom as well as calculated mean and median are shown in Table 1. All deviated significantly from a Gaussian distribution, and mean values overestimated symptom severity, except for urgency in study 2, but differences were small in some cases.

Treatment-associated improvements of OAB symptoms also differed significantly from a Gaussian distribution, regardless whether expressed as delta of episodes (Table 2) or as % reduction (Table 3). Except for nocturia, means generally overestimated absolute improvements. However, differences between mean and median relative improvements were only small and not consistent across symptoms.

INTERPRETATION OF RESULTS

Two non-interventional studies consistently found that neither OAB symptoms nor their improvement upon treatment exhibit a Gaussian distribution. Ignoring this and reporting means leads to an overestimation of symptom severity at baseline and of absolute treatment responses. Relative (%) improvements are less affected.

CONCLUDING MESSAGE

Except for relative improvements, OAB symptoms should be reported as medians and non-parametric tests should be applied in their statistical analysis.

FIGURE 1

Table 1: Baseline severity of OAB symptoms (episodes per 24 h). Patients not exhibiting urgency, nocturia or incontinence were excluded for that parameter. All four parameters differed from a Gaussian distribution in the K2 test at $P < 0.0001$.

	Study 1			Study 2		
Symptom	n	Mean ± SD	Median (IQ)	n	Mean ± SD	Median (IQ)
Urgency	1136	10.7±6.6	10 (6;14)	621	10.0±5.5	10 (6; 13)
Frequency	1309	13.7±4.5	13 (11;16)	730	13.2±4.2	13 (10; 15)
Nocturia	1270	3.5±1.9	3 (2;4)	706	3.5±1.7	3 (2; 4)
Incontinence	785	5.1±3.9	4 (2;7)	418	5.5±3.9	5 (2;7)

Table 2: Absolute reductions of OAB symptoms (delta of episodes per 24 h) after 12 weeks of treatment in the subgroup continuously receiving 30 mg/day. All four parameters differed from a Gaussian distribution in the K2 test at $P < 0.0001$.

	Study 1			Study 2		
Symptom	n	Mean ± SD	Median (IQ)	n	Mean ± SD	Median (IQ)
Urgency	627	7.1±5.2	6 (3;10)	335	6.5±4.6	6 (3; 9)
Frequency	740	5.8±3.7	5 (3;7)	415	4.8±3.5	4 (3; 6)
Nocturia	727	2.0±1.9	2 (1;3)	401	1.7±1.5	2 (1; 2)
Incontinence	414	3.7±3.0	3 (2;5)	218	3.9±3.3	3 (1;5)

FIGURE 2

Table 3: Relative reduction of OAB symptoms (% reduction of episodes per 24 h) after 12 weeks of treatment in the subgroup continuously receiving 30 mg/day. All four parameters differed from a Gaussian distribution in the K2 test at $P < 0.0001$.

	Study 1			Study 2		
Symptom	n	Mean ± SD	Median (IQ)	n	Mean ± SD	Median (IQ)
Urgency	627	71±29	75 (56;92)	335	65±30	67 (50; 90)
Frequency	740	41±17	42 (30;50)	415	36±20	36 (25; 46)
Nocturia	727	59±29	60 (50;75)	401	48±39	50 (33; 67)
Incontinence	414	82±30	100 (67;100)	218	70±39	78 (50;100)

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PATIENTS HAVE POOR COMPLIANCE WITH REPEAT ONABOTULINUMTOXINA INJECTIONS FOR OVERACTIVE BLADDER

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HYPOTHESIS / AIMS OF STUDY

Intra-detrusor onabotulinumtoxin A (Botox®) injection is an efficacious treatment for overactive bladder (OAB). There is a lack of literature characterizing compliance with Botox therapy. We report the outcomes of Botox injection treatment at our institution and evaluate factors which correlate with continuation of maintenance injections.

STUDY DESIGN, MATERIALS AND METHODS

A retrospective chart review was performed on all patients who received Botox injections from April 2013 to October 2017. Patients who received one injection of Botox were compared to those who received more than one. All data analysis was performed with SPSSv24.

RESULTS

We identified 175 patients who received at least one Botox injection. After the first injection, 86% (150/175) reported subjective symptom improvement. Of those who reported improvement, 54% (81/150) followed up for a second injection. Of those who reported no improvement 24% (6/25) also received a second injection. In total, 50% (87/175) returned for a second injection. Patients who received multiple injections were more likely to have perceived symptomatic improvement (p=0.034), and neurological disorders (p=0.011); those who received multiple injections were less likely to have side effects (p=0.027) (Figure 1). There was no significant difference in age, gender, BMI, or distance to clinic between these groups. Even among patients who reported improvement after Botox injection, compliance for subsequent injections was low (Figure 2).

INTERPRETATION OF RESULTS

Our data suggest that the presence of neurological disorders may influence the continuation of Botox therapy. Additionally, we found that despite reported symptomatic improvement, a significant proportion of patients did not follow up for repeat injection. This may be related to the presence of side effects which were less common in patients who chose to continue therapy.

CONCLUDING MESSAGE

There is a paucity of literature regarding the factors associated with maintenance of Botox injections to treat OAB. Our data shows that despite symptomatic improvement reported by 86% of patients in our study, there is a lack of continuation with onabotulinumtoxin injections. Further investigation is required to delineate the factors leading to discontinuation of Botox therapy for treatment of OAB.

FIGURE 1

Demographic and Clinical Data				
	Multiple Botox Injections	One Botox Injection	p-value	Multivariate Regression p-value
Number, N	87	88		
Age mean, years (SD)	61.02 (18.71)	60.77 (17.22)	0.927	0.375
Gender Male Female	18 69	23 65	0.395	0.504
Distance to clinic, mean (SD)	19.37 (27.24)	13.94 (11.82)	0.092	0.071
BMI (SD)	29.35 (7.45)	30.43 (7.53)	0.34	0.33
Neurologic Disorder	31	17	0.016	0.011
Smoking History	26	40	0.034	0.062
Side Effects after First injection	17	31	0.02	0.027
Subjective Symptom Improvement after First injection	81	69	0.005	0.034

FIGURE 2

Maintenance Therapy Rates	
improvement after 1st injection + received 2nd injection	81/150 (54%)
improvement after 2nd injection + received 3rd injection	35/59 (59%)
improvement after 3rd injection + received 4th injection	19/31 (61%)
improvement after 4th injection + received 5th injection	11/13 (85%)
improvement after 5th injection + received 6th injection	6/8 (75%)
improvement after 6th injection + received 7th injection	4/4 (100%)

REFERENCES

1. Lindsey Cox and Anne P Cameron. OnabotulinumtoxinA for the treatment of overactive bladder. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4114914/

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Stony Brook University IRB **Helsinki** Yes **Informed Consent** Yes

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OAB SYMPTOMS: MOMENTARY DIGITAL ASSESSMENT, A SOLUTION TO UNMET CLINICAL NEEDS, USING A REAL LIFE SYMPTOM EVALUATION.

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HYPOTHESIS / AIMS OF STUDY

The study aims to emphasize that the overactive bladder syndrome (OAB) as we know it, needs refinement to select adequate individualized treatments and to improve the treatment outcome. Additionally, to introduce a new assessment method, the experience sampling method (ESM), a digital tool, which is capable of measuring OAB complaints in a real life context, in order to gain insight in the multifactorial character of OAB (1).

STUDY DESIGN, MATERIALS AND METHODS

Current assessment tools used to assess the OAB symptom complex were evaluated. A search on OAB guidelines and assessment tools was conducted in Pubmed and Google. The collected assessment tools were evaluated with respect to potential biases and restrictions, using the Cochrane handbook collaboration's 'Risk of bias' tool. Then, the new ESM assessment tool (a smartphone app), was compared with the currently used assessment methods.

RESULTS

Biases in assessment tools

An overview of the different types of biases related to current assessment methods in OAB is presented in table 1. The most common biases in the questionnaires were: ecological bias, information bias, confirmation bias, wording bias and social desirability bias.

Symptom assessment

Not all symptoms of OAB are assessed in the different evaluated diagnostic tools, as schematized in table 2. All symptoms of OAB: urgency, frequency, incontinence and nocturia are measured in 7 of the 12 (58%) evaluated questionnaires. OAB complaints are bothersome urological complaints, but only 33% of the tools measure symptom bother. Non urological complaints, such as psychiatric complaints, sexuality and the presence of other somatic complaints are evaluated by 3 of the 12 (25%), 6 of the 12 (50%) and 2 of the 12 (<20%) questionnaires, respectively.

Experience Sampling Method

The ESM has a high risk for selection bias and attrition bias, but little risk for information, confirmation, social desirability or ecological bias. There is a moderate risk for wording bias compared to the retrospective questionnaires and bladder diaries. A urological ESM has the potential to momentarily assess all OAB symptoms included in the ICS definition (2) in context with the occurrence of other symptoms, such as psychological, psychiatric, gastro-intestinal, gynaecological and muscular complaints. Moreover, the individual complaint pattern is assessed in the context of everyday life, including patient's location, occupation and social contacts at the time of the assessment. Additionally, quality of life, possible limitations in activities and symptom bother are assessed. Satisfaction of therapy is not assessed with the ESM specifically, but ESM can certainly be used to evaluate treatment response.

INTERPRETATION OF RESULTS

Numerous assessment tools have been developed to help assess OAB symptoms. The difficulty about most of the currently available assessment tools is that each different tool measures only a small part of OAB (i.e. one symptom), even though recently, there is growing evidence on the multifactorial character (3), including triggers of symptoms and comorbidities.

CONCLUDING MESSAGE

Today's retrospective assessment methods are biased, indicating a need for momentary assessment in OAB, that is able to capture the multifactorial character of OAB and pleiotropic presentation of a potential broader but undetected hypersensitivity syndrome. The digital ESM may fulfill this need, and might guide the way to an aetiologically driven classification of OAB.

FIGURE 1

Table 1. Evaluation of the biases in assessment methods on OAB

	Voiding diaries	SR-BDs	ICIQ- OAB	BFLUTS	I-QOL	SUIQQ	UISS	SEAPI-QMM	ISI	KHQ	OAB-q	OABSS	ESM
Selection bias													
Performance bias													
Detection bias													
Attrition bias													
Reporting bias													
Information bias													
Confirmation bias													
Wording bias/ leading questions													
Social desirability bias													
Ecological bias													

HIGH RISK | LITTLE RISK | MODERATE RISK | NOT APPLICABLE

White: recommended tools

ESM: Experience Sampling Method

FIGURE 2

Table 2. Evaluation of the assessment methods on OAB

	Voiding diaries	SR-BDs	OAB	ICIQ-	BFLUTS	I-QOL	SUIQQ	UISS	QMM	SEAPI-	ISI	KHQ	OAB-q	OABSS	ESM
Urgency															
Nominal						x									
Ordinal		x	x		x		x		x			x	x	x	x
Frequency	x	x	x		x	x						x	x	x	x
Incontinence	x	x	x		x	x	x	x	x		x	x	x	x	x
Nocturia	x	x	x		x	x						x	x	x	x
Quality of life					x	x	x	x	x			x	x		x
Psychological items*						x						x	x		x
Psychiatric items**						x			x			x			x
Satisfaction therapy							x								
Other complaint ***								x				x			x
Bother			x		x	x	x								x
Sexuality					x	x	x	x	x			x			x

White: recommended tools | ESM: Experience sampling method

* items on psychological well-being

** items on psychiatric well-being | *** other non-urological somatic complaints

REFERENCES

1. Leue C, Kruimel J, Vrijens D, Masclee A, van Os J, van Koeveringe G. Functional urological disorders: a sensitized defence response in the bladder-gut-brain axis. Nature Reviews Urology. 2016.
2. Abrams P, Cardozo L, Fall M, et al. The standardisation of terminology of lower urinary tract function: report from the Standardisation Sub-committee of the International Continence Society. Neurourology and urodynamics. 2002;21(2):167-178.
3. Altman D, Iliadou AN, Lundholm C, Milsom I, Pedersen NL. Somatic comorbidity in women with overactive bladder syndrome. The Journal of urology. 2016;196(2):473-477.

Funding None **Clinical Trial** No **Subjects** None

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EVIDENCE-BASED MANAGEMENT OF OVERACTIVE BLADDER PATIENTS: EXPECTATION TO BECOME SYMPTOM-FREE

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HYPOTHESIS / AIMS OF STUDY

Muscarinic receptor antagonists are the mainstay of pharmacological treatment of the overactive bladder syndrome (OAB) but long-term adherence is poor. Other than issues of tolerability, unmet expectations on treatment outcomes are one of the key reasons for limited adherence. Two reasons make evidence-based counseling of patients on realistic treatment outcomes of randomized controlled trials troublesome. Firstly, their formal inclusion and exclusion criteria as well as the knowledge to be a participant of a study make it difficult to extrapolate findings to a routine treatment setting. Secondly, randomized studies typically report group means for outcomes that provide little information on the probability to become free of a given symptom. Therefore, we have analyzed two large non-interventional studies to explore the probability of becoming symptom-free.

STUDY DESIGN, MATERIALS AND METHODS

Two non-interventional studies of similar design were analyzed. Neither had specified inclusion or exclusion criteria other than the recommendations from the prescribing information. Patients were invited to participate if they started treatment with propiverine ER (30-45 mg/day; dose adjustment during the study was permitted) at the recommendation of their physician. Diary parameters of urgency, frequency, nocturia and incontinence were analyzed at baseline and after 12 weeks of treatment.

Patients were included in the analysis if they had a pathological value for a given symptom at baseline (at least 1 episode of urgency, nocturia or urinary incontinence or at least 8 micturitions per 24 h) and a recorded value after 12 weeks. Moreover, these analyses were repeated in subgroups with smaller and greater symptom intensity at baseline. Symptom-free was defined as no episodes at week 12 for urgency, nocturia and incontinence and ≤7 voids (all per 24 h). Due to the exploratory and post-hoc character of the evaluation, no statistical analysis was performed. Instead, we used the data from two studies to test robustness of the results.

RESULTS

Studies 1 and 2 included 1335 (median age: 68 years, 66% female, treatment naïve: 32%) and 745 (median age: 69 years, 63% female, treatment naïve: 36%) patients, respectively. Median episode frequency in both studies was 10 for urgency, 13 for frequency, 3 for nocturia and 4 and 5 for incontinence in studies 1 and 2, respectively. Median reduction after 12 weeks in both studies was 6 for urgency (-60%), 2 for nocturia (- 67%), 3 for incontinence (-60 to -75%) and 6 and 5 for frequency in studies 1 and 2 (-54 to -62%), respectively.

The probability to become free of a given symptom after 12 weeks of treatment is shown in Table 1.

INTERPRETATION OF RESULTS

The probability to become free of a given symptom was greatest for frequency and incontinence, smallest for nocturia and intermediate for urgency. Patients with a lower symptom incidence at baseline had a greater chance of becoming symptom-free, but even those with at least 14 voids or 4 incontinence episodes had a considerable chance of becoming symptom-free.

Of note, becoming free of one given symptom did not necessarily predict becoming free of the other symptoms. Moreover, this analysis only applies to those who stayed on treatment for 12 weeks.

Although the two non-interventional studies used for this analysis have been based on propiverine ER, we have no reason to believe that very different results would be obtained with other muscarinic antagonists. Nonetheless, analysis of similar datasets obtained with other OAB drugs appears desirable.

CONCLUDING MESSAGE

These data can be used in the counseling of OAB patients to set realistic treatment expectations. This may help to improve long-term adherence to treatment.

FIGURE 1

Table 1: Probability to be symptom-free after 12 weeks of treatment for urgency, frequency, nocturia and incontinence. Data are shown for all patients having that symptom at baseline and reporting data for it at week 12, and as absolute numbers. Subgroups of patients with more and less severe symptoms at baseline are also shown.

	Study 1		Study 2	
	%	n	%	n
Urgency				
All	21.2	214	17.6	97
1-8 episodes	28.3	123	24.9	58
≥9 episodes	15.9	91	12.3	39
Frequency				
All	48.0	548	43.0	271
8-13 voids	60.3	365	57.9	201
≥14 voids	34.1	183	24.7	70
Nocturia				
All	13.9	161	7.7	50
1-3 episodes	19.5	130	11.8	45
≥4 episodes	6.4	31	1.9	5
Incontinence				
All	52.3	359	37.8	138
1-3 episodes	68.0	200	59.9	88
≥4 episodes	40.6	159	22.9	50

Funding Apogepha **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics Committee** Sächsische Landesärztekammer EK-BR-14/12-1 and EK-BR-18/14-1 **Helsinki** Yes **Informed Consent** Yes

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BEST IN CATEGORY PRIZE "ANORECTAL / BOWEL DYSFUNCTION"

IS A RESTRICTIVE USE OF EPISIOTOMY FOR INSTRUMENTAL DELIVERY ASSOCIATED WITH AN INCREASE OF OBSTETRIC ANAL SPHINCTER INJURIES?

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HYPOTHESIS / AIMS OF STUDY

Obstetric Anal Sphincter Injuries (OASI) represent severe perineal tears involving at least a partial rupture of the external anal sphincter which occurs for 0.4-5% of deliveries and could strongly impact women's health. It corresponds to stage 3 or more of the Royal College of Obstetricians and Gynaecologists (RCOG) classification. Several risk factors are well described in the literature such as: nulliparity, short perineal body, increased fetal weight, posterior fetal presentation, prolonged second stage of labor, medial episiotomy and instrumental delivery [1]. It is also well reported that a liberal use of a mediolateral episiotomy in vaginal delivery has no benefit in order to avoid an OASI. Nevertheless, the potential protective effect of mediolateral episiotomy during instrumental vaginal delivery remains unclear. Instrumental delivery is a high-risk situation for OASI occurrence, especially when other risk factors co exists (posterior presentation, nulliparity). The literature in this thematic is contradictory but there are several studies reporting an increase in OASI occurrence when there is an instrumental delivery without episiotomy [2]. These studies are difficult to interpret since they often deal with teams having a liberal use of episiotomy. This considered it remains unclear if a restrictive use of mediolateral episiotomy during an instrumental delivery is associated with a higher risk of OASI.

Since 2005, according to the French guidelines, our institution introduced a restrictive use of mediolateral episiotomy for all vaginal deliveries including instrumental deliveries. We hypothesize that this change in our practices may have been affect our OASI incidence.

The main endpoint of this study was to assess if there is an increased risk of OASI associated with a restrictive use of mediolateral episiotomy during instrumental delivery.

STUDY DESIGN, MATERIALS AND METHODS

This is a retrospective study based on a French university maternity register. We collected and entered into the register at the time of birth data about women characteristics

(age, body mass index, parity), mode of delivery: epidural analgesia, term, second stage of labor length, expulsive phase length, mediolateral episiotomy use and type of instrument used, OASI occurrence with the RCOG classification and birthweight. We analyzed all the instrumental deliveries at more than 34 weeks of gestation for singleton in cephalic presentation between January 2005 and December 2015.

Continuous variables were compared using a Student t test and categorical variables were compared using a $\chi 2$ test. We performed a multivariate analysis using a logistic regression in order to investigate the effect of mediolateral episiotomy during an instrumental delivery for OASI occurrence. For all analyses, significance was considered for $p<0.05$ and we calculated Odd Ratios (OR) with 95% confidence interval when it was appropriate. When admitted in our institution, each patient receive the hospital chart that specifically mentions the possibility that anonymized medical data collected during hospitalization could be used for medical research. Considering French regulations, ethical committee approval was not required for this retrospective study.

RESULTS

Among 19792 vaginal deliveries of singleton in cephalic presentation upon 34 weeks of gestation, 2357 were instrumental deliveries (11.9%). These 2357 instrumental deliveries were associated with a mediolateral episiotomy in 950 cases (40.3%) and an OASI occurred in 174 cases (7.4%). Characteristics of women and mode of delivery are reported in table 1. Between 2005 and 2015, we observed a significant reduction of our rate of episiotomy for instrumental delivery from 78.5 to 16.2% ($p<0.05$) whereas our rate of OASI increased from 3.1 to 12.7% ($p<0.05$) (Figure 1). We found an OR at 3.66 [2.5-5.5] for OASI occurrence in case of instrumental delivery without episiotomy.

INTERPRETATION OF RESULTS

In our experience a restrictive use of mediolateral episiotomy for instrumental delivery was associated with an increase of OASI occurrence in a 11-year period.

The main strength of this study is that it provides data about the effect of episiotomy in instrumental delivery in a team with a restrictive use of episiotomy whereas most of the papers available came from teams with a liberal use of episiotomy. The main limitation is that it was a retrospective and mono centric study. This considered, our study is not able to demonstrate the protective effect of mediolateral episiotomy in instrumental delivery. The increase of OASI incidence that we reported may have two origins. The first one is a potential protective effect of episiotomy in this specific indication and the second is that since 2010 our team implement a standardized description of OASI using the RCOG classification whereas before 2010 we used the French classification. This might have induced more diagnosis of OASI with tears that would not have been classed as OASI with the French classification (especially stage 3A). Finally, the potential protective effect of episiotomy might be interesting in cases where multiple risk factors exist (nulliparous, posterior presentation, forceps) with a very high risk of OASI. In such conditions, the use of mediolateral episiotomy should be considered to avoid OASI.

CONCLUDING MESSAGE

A restrictive use of episiotomy during instrumental delivery seems associated with an increased risk of OASI. Mediolateral episiotomy should be considered when instrumental delivery is associated with several risk factors for OASI

FIGURE 1

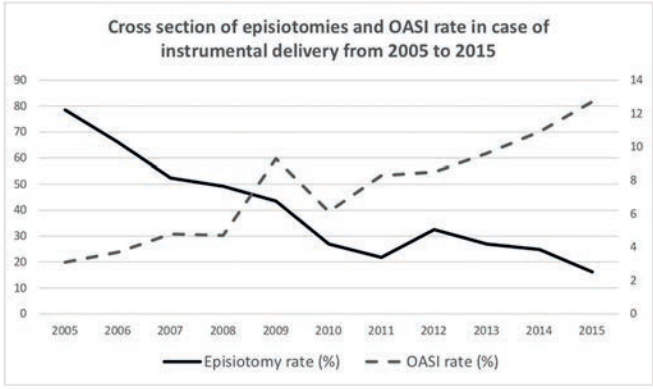
Table 1: Women and instrumental deliveries characteristics (N=2357)

	Mean (SD) or N (%)
Women characteristics	
Age (years)	29 (3.5)
Body mass index (kg.m^{-2})	22.7 (2.1)
Primiparous	1870 (79.3)
Delivery characteristics	
Term (weeks)	40 (2.1)
Epidural analgesia	2048 (86.9)
Second stage length (min)	102.5 (109.6)
Expulsive phase length (min)	25.5 (19.1)
Forceps	1350 (57.3)
Vacuum	847 (35.9)
Spatulas	160 (6.8)
Birthweight (g)	3337 (587)

SD: Standard Deviation

FIGURE 2

Figure 1 – Cross section of episiotomy and OASI rate in case of instrumental delivery from 2005 to 2015



REFERENCES

1. Gynecol Fertil Obstet Senol. 2018. DOI:10.1016/j.gofs.2018.01.004
2. Int Urogynecol J. 2018. DOI:10.1017/s00192-017-3422-4

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Upon admission, each patient at our institution receives a document that specifically mentions the possibility that anonymized medical data collected during hospitalization could be utilized for medical research. Considering French regulations, ethical committee approval was not required for this retrospective study. **Helsinki** Yes **Informed Consent** Yes

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CLINICAL EVALUATION OF A VAGINAL BOWEL CONTROL SYSTEM FOR THE TREATMENT OF FECAL INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

A previous proof of efficacy and safety study showed short-term benefit for a vaginal bowel control device for fecal incontinence (FI). This study evaluated the longer-term clinical effectiveness and impact on quality of life for women with FI.

STUDY DESIGN, MATERIALS AND METHODS

Women with > 4 fecal incontinence episodes over 2 weeks were fit with the intra-vaginal device. In this responder analysis, subjects achieving a 50% reduction in FI episodes over a 2-week testing period were included in this trial. Treatment success was defined as achieving a >50% reduction of incontinent episodes, and was assessed at the primary endpoint of 3 months, and 6 and 12 months. The sample size for the study was selected to provide >90% power to detect a response rate of >40% of subjects achieving treatment success, and an exact binomial test was used to determine if this response rate was met at the 3, 6 and 12 month time points. Secondary outcomes included symptom impact measured by the Fecal Incontinence Quality of Life, symptom distress using the St Mark's (Vaizey) questionnaire, Patient Global Impression of Improvement (PGI-I) and device satisfaction. Adverse events were collected. Intention-to-treat analysis included subjects who were successfully fit, responded to initial testing and entered treatment. Per protocol analysis included subjects with valid treatment diaries, no major protocol deviations and completion of the 3-month visit.

RESULTS

73 subjects from eleven clinical sites were successfully fit and entered treatment. At 3 months, intention-to-treat success was, 72.6% (53/73, p<.0001) and per protocol success, 84.1% (53/63, p<.0001) (Table). Per-protocol success rate at 6 and 12 months was 89.5% (51/57), (95% CI, 78.5 – 96.0%) and 94.4% (51/54), (95% CI, 84.6 – 98.8%), respectively (Table). ITT success rate at 6 and 12 months was 71.2% (52/73) (95% CI, 59.4 – 81.2%) and 69.9% (51/73) (95% CI, 58.0 – 80.1%), respectively. Subjects counted in the ITT, but not in the PP, include those lost to follow-up, early study exits, and an incomplete study diary. Among study completers, the average reduction in FI episodes improved over time from 77.3%, to 82.6%, to 85.4% at 3, 6, and 12 months, respectively. There was significant improvement in all Fecal Incontinence Quality of Life (p<.0001) subscales (Figure). There was significant improvement of all time-points from baseline in the St Mark's questionnaire (Table). Satisfaction was noted to be 90.3% (56/62), 89.3% (50/56) and 94.4% (51/54) at the 3, 6 and 12-month time-points, respectively; and 77.4% (48/62) vs 77.6% (45/58) vs 79.6% (43/54) of subjects were very much or much better on the PGI-I at 3, 6 and 12 months, respectively. There were no serious adverse events; the most common study-wide device-related adverse event including all enrolled subjects was vaginal abrasion (26/137 subjects, 19%), the majority of events (19/26, 63%) occurring during the fitting period.

INTERPRETATION OF RESULTS

For women with FI, the use of a transvaginal device with adjustable balloon resulted in a significant reduction in FI episodes and high treatment efficacy at 3 months, sustained to 12 months. Satisfaction with the device use was high and global impression of improvement of incontinence was found to be better or very much better in the majority of women. Adverse events are low and mainly noted in the fitting period.

CONCLUDING MESSAGE

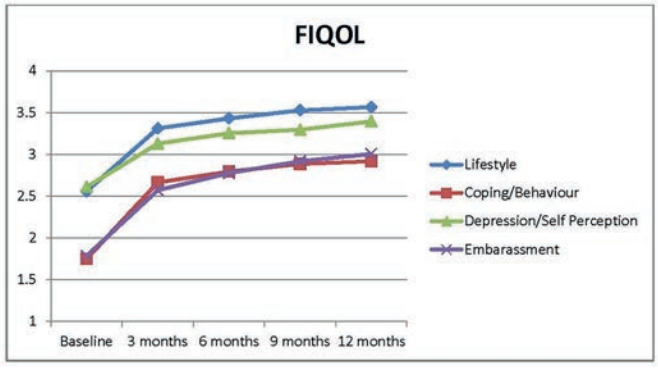
A successfully fit vaginal bowel control device is an effective non-surgical treatment option for FI with effectiveness at 3, 6 and 12 months by objective and subjective measures.

FIGURE 1

Value	Results		p-value*,**	95% Confidence Interval
ITT subjects with ≥50% reduction, 3-months	53/73 (72.6%)		<.0001	60.9% - 82.4%
PP subjects with ≥50% reduction, 3-months	53/63 (84.1%)		<.0001	72.7% - 92.1%
PP subjects with ≥50% reduction, 6-months	51/57 (89.5%)		<.0001	78.5% - 96.0%
PP subjects with ≥50% reduction, 12-months	51/54 (94.4%)		<.0001	84.6% - 98.8%
Mean number of weekly FI episodes, PP subjects, Mean (SD):	Baseline: 7.1 (6.40)	3 months: 1.5 (1.77)	<.0001	1.0 - 1.9
		6 months: 1.1 (1.61)	<.0001	0.7 – 1.5
		12 months: 0.9 (1.39)	<.0001	0.5 – 1.3
Mean Vaizey (St. Marks) score, PP subjects, Mean (SD)	Baseline: 16.5 (3.95)	3 months: 9.2 (5.04)	<.0001	7.9 – 10.5
		6 months: 8.9 (5.26)	<.0001	7.5 – 10.3
		12 months: 9.8 (5.54)	<.0001	8.3 – 11.3

* Comparing whether the proportion of responders (≥ 50% reduction) is greater than 40% of subjects; based on exact binomial test. ** p-values for mean scores (FI episodes, Vaizey) are based on a repeated measures analysis of the percent change from baseline with baseline averages as a covariate.

FIGURE 2



Funding Pelvalon Research Grant **Clinical Trial** Yes **Registration Number** NCT02428595 **RCT** No **Subjects** Human **Ethics Committee** Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

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THE IMPACT OF ACCIDENTAL BOWEL LEAKAGE ON PHYSICAL PERFORMANCE AMONG OLDER ADULTS

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HYPOTHESIS / AIMS OF STUDY
Accidental bowel leakage (ABL) is a stigmatizing condition and may result in self-limited physical activity and potentially impacting overall physical function among older adults. The association between ABL and age-related changes in physical function is unknown. We aimed to investigate the relationship between ABL and physical performance and sarcopenia among older adults. We hypothesize that older initially well-functioning adults with ABL at baseline will have a greater decline in their physical function by year 4.

STUDY DESIGN, MATERIALS AND METHODS
We analyzed a retrospective cohort of well-functioning, white and black women and men ages 70-79 years enrolled in the prospective longitudinal cohort of the Health, Aging, and Body Composition (Health ABC) study. ABL was characterized at baseline using a validated question assessing the symptom and severity of ABL. Participants with ABL were included in the exposed group and those without were controls. Physical function was measured by the Short Physical Performance Battery (SPPB) and the Health ABC physical performance battery (PBB) that includes an assessment of usual and fast walking speed and balance measures (timed chair stands and standing balance). Sarcopenia was determined using grip strength, gait speed, and appendicular skeletal muscle mass index parameters. Univariate and multivariate analyses were performed to compare physical function and sarcopenia measures between exposed and control groups accounting for age, gender, race, BMI, study site, diabetes, hypertension, and cardiovascular disease and using a significance level of 0.05.

RESULTS
Of the 3,075 participants in the Health ABC cohort, 1,262 answered the question on ABL and were included in the analysis: 106 (8%) had ABL and 1156 (92%) did not. Mean age and BMI of this cohort was 73 years and 27 kg/m2, respectively. There were no demographic differences based on gender or presence of ABL. ABL was most prevalent among Non-Hispanic whites in comparison to Blacks (p=0.005) and women compared to men (p=0.04). Higher parity was significantly associated with ABL (p=0.009) as was more impactful depression scores, p<0.0001. Participants with ABL had poorer physical performance (PPB) scores compared to those without ABL, mean(SD) 1.95(0.04) and 2.02(0.02), p=0.037, respectively. While SPPB scores were similar between participants with and without ABL (p=0.23), repeated chair stand speed and standing balance time was lower among participants with ABL [mean(SD) repeated chair stands, 58.8(1.78) seconds compared to 61.8(0.85) seconds, p=0.08; mean(SD) standing balance 0.31(0.01) seconds vs 0.33(0) seconds, p=0.046, respectively].

INTERPRETATION OF RESULTS
Sarcopenia measures were present among 884/1262 participants; 47% (47/99) of women with ABL and 31% (22/70) of men with ABL without a significant difference based on gender, p=0.94. There were no significant differences in usual or fast gate speed, or grip strength.

CONCLUDING MESSAGE
We present a novel observation that physical performance declined more significantly among older women and men with ABL. Balance measures such as timed chair stands and standing balance may be important markers of weakness impacting this observation. Robust prospective studies are needed to characterize the relationship between ABL and poor physical performance.

Funding None **Clinical Trial** Yes **Public Registry** No **RCT** No **Subjects** Human **Ethics not Req'd** It was a retrospective studt **Helsinki** Yes **Informed Consent** Yes

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CHARACTERIZATION OF SYMPTOM SEVERITY AND IMPACT OF FOUR FECAL INCONTINENCE PHENOTYPES IN WOMEN PRESENTING FOR EVALUATION AND TREATMENT

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HYPOTHESIS / AIMS OF STUDY
Despite fecal incontinence (FI) having a major impact on quality of life, a paucity of data exists comparing characteristics of individual FI phenotypes: urge FI, passive FI and combined urge/passive FI. The primary aim of this study is to characterize symptom specific distress and quality of life among women with these FI phenotypes. The secondary aim is to characterize FI symptom specific distress and quality of life in women with a fourth phenotype, stress FI.

STUDY DESIGN, MATERIALS AND METHODS
Women presenting to a single academic institution for the evaluation of anal incontinence symptoms from 2003-2017 were included in this retrospective study. IRB approval was obtained. All participants completed the Modified Manchester Health Questionnaire (MMHQ) which consists of the validated Manchester Health Questionnaire (MHQ)

measuring symptom specific impact and the Fecal Incontinence Severity Index (FISI) measuring symptom distress. General health-related quality of life was assessed with the Short Form-12 (SF-12). Patients were included in this study if they had at least monthly FI as reported by their responses on the MMHQ. Patients were divided into 4 groups: urge FI, passive FI, combined urge/passive FI and stress FI based on responding "most of the time" or "all of the time" to the urge, passive and stress symptom specific questions of the MMHQ. The urge question asks, "Can you hold solid/liquid stool long enough to get to the bathroom." The passive question asks, "Do you lose any solid/liquid stool when walking?" The stress question asks, "Do you lose any solid /liquid stool when coughing or sneezing?" Anorectal physiology was assessed using anorectal manometry and endoanal ultrasound. Demographic data and clinical medical history were collected. Patient characteristics and symptoms were compared across FI subtypes using one-way ANOVA (and Kruskal-Wallis tests as appropriate) for quantitative measures and chi-squared tests (and Fisher's exact test as appropriate) for categorical measures. Analysis of covariance (ANCOVA) was performed to evaluate associations between patient symptoms and FI subtypes while controlling for pertinent baseline characteristics. Level of significance was assessed at 0.05.

RESULTS

In the total cohort of 404 subjects, the majority of patients were Caucasian (88%) with a mean age of 58 ± 12 years. Baseline demographics and medical history were similar in all 3 groups except for age (p=0.02), diabetes, presence of inflammatory bowel disease and urinary incontinence (all p<0.01). Total MMHQ scores were significantly different among the 3 main subtypes with combined urge/passive FI having the most impact and urge FI alone having the least impact (p<0.01) (Table 1). FISI scores were also significantly different among the 3 main subtypes with combined urge/passive FI having the greatest distress and urge FI having the least (p<0.01). SF-12 subscales were similar across the 3 main subtypes. No differences were observed in anorectal manometric measurements or anal sphincter integrity among the 3 groups (Table1). The differences in total MMHQ and FISI scores remained statistically significant (both p<0.01) when controlling for relevant patient characteristics in multivariable models. FI symptom distress and condition specific impact among women with stress FI compared to urge and passive FI were then explored (Table 2). Baseline demographics and medical history were similar in all 3 groups except for smoking status and urinary incontinence (both p<0.01). No differences among the 3 groups were observed for total MMHQ scores. FISI scores were greater in the stress FI group compared to the urge FI and passive FI groups (p<0.01). No differences were observed in the SF-12 subscales. Rectal capacity was greater in the in the passive FI group followed by stress FI and urge FI (p=0.01). No differences were observed in the remaining anorectal manometric measurements or anal sphincter integrity among the 3 groups (Table 2). In multivariable analyses, there continued to be no statistically significant difference in MMHQ (p=0.31) and the observed differences in FISI were nullified (p=0.26).

INTERPRETATION OF RESULTS

Among the 3 main subtypes studied, combined urge/passive FI has a greater symptom distress and impact on quality of life than urge FI and passive FI alone.. There were no differences in anorectal manometric measurements or anal sphincter integrity among these 3 main subtypes. Symptom distress and impact for stress FI did not differ from urge or passive FI, but this may be due to the relatively small sample size in this study.

CONCLUDING MESSAGE

In conclusion, combined urge/passive FI has a higher symptoms distress and impact on quality of life than either urge or passive fecal incontinence alone despite similar anorectal testing results. Further research is needed to determine the significance of stress FI as a potential subtype and its response to treatment.

FIGURE 1

Table 1. Symptom Distress, Impact and Anorectal Testing Results in Women with Urge FI, Passive FI and Combined Urge/Passive FI

	Urge FI (n=220)	Passive FI (n=67)	Combined Passive/Urge FI (n=113)	P (global)
Total MMHQ, mean ± SD	57.9 ± 19.5	64.9 ± 17.2	68.5 ± 16.1	<0.01
Subscales of MHQ				
1. Impact	63.4 ± 23.2	61.9 ± 27.0	69.9 ± 22.2	0.03
2. Role	56.7 ± 26.4	65.9 ± 20.6	67.8 ± 22.0	<0.01
3. Physical	57.2 ± 27.7	71.8 ± 18.9	70.7 ± 22.8	<0.01
4. Social	51.5 ± 30.9	60.1 ± 30.5	66.2 ± 24.5	<0.01
5. Relationship	50.1 ± 32.4	62.3 ± 31.3	62.5 ± 29.2	<0.01
6. Emotion	66.3 ± 25.0	72.3 ± 25.9	76.3 ± 22.0	<0.01
7. Sleep/Energy	44.2 ± 31.3	46.5 ± 33.2	55.8 ± 32.0	<0.01
8. Severity	73.6 ± 18.2	78.5 ± 13.8	79.0 ± 15.4	<0.01
FISI	31.1 ± 11.3	36.9 ± 11.6	38.1 ± 12.5	<0.01
SF-12 Subscale Score, mean ± SD				
PCS	39.7 ± 12.5	42.0 ± 11.5	37.2 ± 11.7	0.05
MCS	39.1 ± 12.7	37.1 ± 12.9	35.6 ± 11.5	0.06
Anorectal Manometry, mean (std)				
Resting Pressure mmHg	34.4 (18.3)	31.0 (14.4)	31.1 (17.4)	0.18
Squeeze Pressure, mmHg	67.4 (30.0)	70.6 (33.1)	64.3 (31.9)	0.43
Rectal Capacity, mL	112.2 (55.8)	130.9 (70.4)	112.8 (60.1)	0.09
Endoanal Ultrasonography, n (%)				
EAS Defect	36 (17%)	14 (22%)	29 (27%)	0.13
IAS Defect	51 (24%)	16 (25%)	34 (31%)	0.40

FIGURE 2

Table 2. Symptom Distress, Impact and Anorectal Testing Results in Women with Urge FI, Passive FI and Stress FI

	Urge FI (n=179)	Passive FI (n=39)	Stress FI (n=29)	P (global)
Total MMHQ, mean ± SD	56.4 ± 19.1	62.3 ± 16.9	56.0 ± 11.7	0.20
Subscales of MMHQ				
1. Impact	62.4 ± 23.6	58.3 ± 25.2	64.7 ± 20.6	0.50
2. Role	55.1 ± 26.2	65.4 ± 22.1	55.2 ± 26.4	0.07
3. Physical	55.4 ± 27.6	68.9 ± 20.0	53.4 ± 32.5	0.02
4. Social	49.3 ± 31.1	56.7 ± 28.8	50.0 ± 28.1	0.38
5. Relationship	48.3 ± 31.6	61.5 ± 29.3	34.1 ± 35.2	<0.01
6. Emotion	65.3 ± 24.9	70.2 ± 23.5	65.4 ± 23.5	0.52
7. Sleep/Energy	43.0 ± 31.4	42.0 ± 33.3	49.6 ± 26.4	0.54
8. Severity	72.5 ± 18.7	75.2 ± 14.8	75.4 ± 18.6	0.56
FISI	29.9 ± 11.3	34.9 ± 11.3	35.0 ± 11.8	<0.01
SF-12 Subscale Score, mean ± SD				
PCS	39.8 ± 12.7	42.8 ± 11.6	35.4 ± 10.7	0.08
MCS	40.3 ± 12.5	37.9 ± 13.5	39.2 ± 12.5	0.56
Anorectal Manometry, mean (std)				
Resting Pressure mmHg	34.9 ± 19.4	29.4 ± 13.3	36.4 ± 20.8	0.24
Squeeze Pressure, mmHg	68.7 ± 31.9	71.6 ± 26.9	72.2 ± 35.9	0.80
Rectal Capacity, mL	111.2 ± 57.1	143.7 ± 72.1	131.7 ± 72.7	0.01
Endoanal Ultrasonography, n (%)				
EAS Defect	29 (16.5)	9 (23.7)	4 (14.8)	0.53
IAS Defect	39 (22.2)	9 (23.7)	5 (18.5)	0.88

Funding Partially supported by the National Institutes of Diabetes and Digestive and Kidney Diseases, 2K24-DK068389 to HE Richter **Clinical Trial** No **Subjects** Human **Ethics Committee** The University of Alabama at Birmingham Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

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SDF-1 PLASMID TO REGENERATE THE ANAL SPHINCTER: ARE WE CLOSER TO TRANSLATION?

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HYPOTHESIS / AIMS OF STUDY

In a rat model, we have documented regeneration after a chronic large injury of the anal sphincter muscle at 4 and 8 weeks after treatment with a plasmid encoding stromal cell derived factor -1 (SDF-1) which is a cytokine that is chemotactic for stem cells and is responsible for aiding angiogenesis after injury

Hypothesis: SDF-1 plasmid regenerates muscle and increases pressures after a chronic large anal sphincter injury in a large animal model

Aim : To evaluate regeneration of a chronic large anal sphincter defect in a pig model after treatment with a plasmid encoding SDF-1.

STUDY DESIGN, MATERIALS AND METHODS

Under an institution of animal care and use committee approved protocol 20 19 age and weight matched Sinclair minipigs were subjected to excision of the posterior half of the anal sphincter muscle and left to recover for 6 weeks. They were then randomly allocated to receive either saline treatment 1 ml (Saline, n=5), 1 injection of SDF-1 plasmid 2 mg/ml (1-SDF-1, n=109) or 2 injections of SDF-1, 2 mg/ml each at 2 week intervals (2-SDF-1, n=5) under anesthesia. Injections were made at the two ends of the incision in the region of the severed muscle. Animals were euthanized 8 weeks after the last treatment and subjected to histopathology.

Outcomes included anal manometry and anal ultrasound done pre-injury, at time of first injection and before euthanasia. Unpaired T-test followed by nonparametric testsOne way ANOVA followed Tukey test were used for data analysis (mean±SD), $p<0.05$ was regarded as significant.

RESULTS

There were no treatment related complications. Two pigs in the control group died due to unrelated causes and were replaced.

At pre-injury and post-treatment, no significant difference was found among 3 groups. When comparing the anal pressure among 3 time points within animal groups, there was no significant difference was found in saline group; in 1-SDF-1 group, at post-treatment had there was significantly higher pressure than both pre-injury (*$p<0.001$) and pre-treatment time point (#$p<0.001$); no significant difference was found within 2-SDF-1 group.

Single injection treatment: The pressures in the control group were higher at the pre-injury time point and statistically significant ($p=0.002$). At pre-treatment the pressure in the control group was significantly higher ($p=0.002$). At 8 weeks after treatment, the difference in resting pressures in the control group was negative from pre-treatment pressures indicating that the pressures declined and did not return to pre-injury or pretreatment levels, while those in the SDF-1 treatment group increased significantly from pre – treatment ($p=0.002$) when compared with the control group.

Two injection treatment: After treatment the SDF-1 treatment group had significantly higher posterior anal pressures compared to saline group. ($p=0004$) When comparing the mean resting pressure between 3 time points within the animal group the pressure was not significantly different .

Ultrasound imaging at 8 weeks after treatment revealed disruption of the muscle posteriorly in the control group with more complete muscle in the SDF-1 group compared to pre-injury.

Histology qualitative analysis shows distortion of normal anatomy with patchy regeneration in the control group while muscle was more organized in the treatment group .Quantitative analysis is awaited.

Histological appearance of saline treated group on the left and SDF-1 1 injection on the right. A marks anterior while the defect is posterior

INTERPRETATION OF RESULTS

The pressures in the posterior channel at the site of the injury increased in both the SDF treated groups. The mean resting pressures in the one injection treatment were higher post treatment that at preinjury

The two injection group although much improved did not shot a mean pressure increase that was significant. This may be due to the sample size.

The pigs were also anesthetized and this may have had an effect on the anal manometry .

Histological regeneration however was qualitatively seen in both SDF-1 treated groups that was more organized than the saline group

CONCLUDING MESSAGE

Eight weeks after both a single dose of SDF-1 and 2 doses injected 6 weeks after an excision of 50% of the circumference of the anal sphincter improved resting anal sphincter pressures, and regenerated muscle in the entire area of the defect. SDF-1 plasmid is safe and effective in treating chronic defects of the anal sphincter in a large animal and can be translated.

FIGURE 1

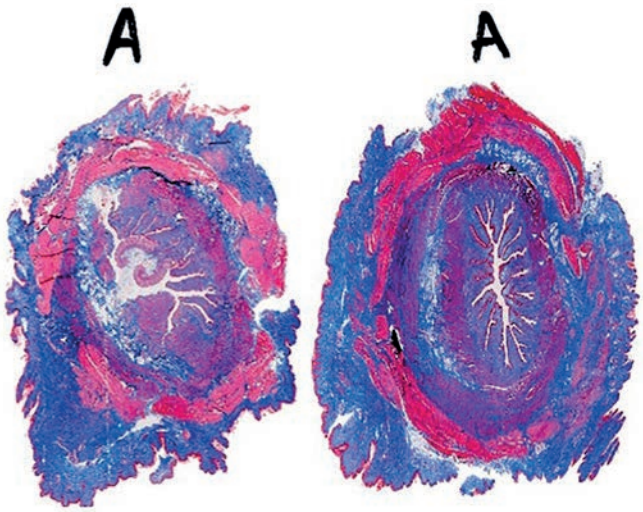

FIGURE 2

Table : Results of anal manometry . Resting pressures

	Pressure Mean± SD (cmH_2O)		
	Pre-injury	Pre-treatment	Post-treatment
Saline (n=5)	10.2±9.44	15.1±4.33	7.3±2.72
SDF-1 I injection (n=9)	*5.7±2.64	#6.9±2.10	15.1±6.64
SDF-1 2 injections(n=5)	9.2±6.64	12.2±5.41	12.5±5.09

REFERENCES

1. Sun L, Kuang M, Penn M,Damaser MS, Zutshi M. Stromal Cell-Derived Factor 1 Plasmid Regenerates Both Smooth and Skeletal Muscle After Anal Sphincter Injury in the Long Term. Dis Colon Rectum. 2017; 60: 1320-1328.

Funding The Armed Forces Institute of Regenerative Medicine (AFIRM-2) W81XWH-13-AFIRMIIRP **Clinical Trial** No **Subjects** Animal **Species** Mini Pig **Ethics Committee** Cleveland Clinic IACUC

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BIOFEEDBACK PLUS TRANSANAL ELECTRICAL STIMULATION IN WOMEN WITH PELVIC FLOOR DYSSYNERGIA

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HYPOTHESIS / AIMS OF STUDY

Constipation is defined as the complaint that bowel movements are infrequent and/or incomplete and/or there is a need for frequent straining or manual assistance to defecate, according to the International Continence Society (ICS) and the International Urogynecological Association (IUGA) it can be due to slow transit or by obstructed defecation (inability to relax the external anal sphincter/dyssynergic defecation)1.

Numerous studies have described the use of biofeedback (BF) therapy for the treatment of pelvic floor dyssynergia, but few describe the combination of BF with electrical stimulation (EST)2. The aims of this study are to demonstrate that biofeedback plus transanal EST can improve bowel symptoms in constipated women with dyssynergic defecation.

STUDY DESIGN, MATERIALS AND METHODS

The design was a retrospective observational study in a Urogynecology referral clinic. Records from August 2011 to July 2017 were included; of women referred to our hospital with the diagnosis of dyssynergic defecation (the diagnoses were based on symptoms, physiologic and radiologic studies). All

of these women had longstanding symptoms unresponsive to laxatives and dietary changes.

History and physical examinations were analyzed to exclude constipation secondary to organic causes.

Exclusion criteria included pregnancy, neurologic diseases and impaired cognizance.

All patients were treated with EMG biofeedback alternated with electrical stimulation (MyoTrac Infiniti™), they underwent a session once a week for six to twelve sessions. The procedure was conducted with the patient in the lithotomy position. The duration of these treatment sessions was 25 minutes and EST was performed using an endoanal probe connected transanally. Stimulatory parameters included a pulse width of 80 msec, a frequency of 10 Hz with the voltage adjusted to each patient´s threshold of pain in response to electrical stimulus. Patients were taught squeeze-relax exercises.

Baseline demographic characteristics included age, parity, vaginal deliveries and BMI. We evaluated the severity of the symptoms with a visual analogue scale (VAS), the number of defecations per week, pain during defecation and use of laxatives, and these parameters were compared before treatment versus session 6, and before treatment versus session 12. Assessment of self-reported improvement was analyzed at the end of each session. All statistical analyses were performed using SPSS version 24.0. Data are expressed as mean ± standard deviation. Student´s t test was used to compare continuous parameters and McNemar test for non-continuous parameters.

RESULTS

We included the records of 34 patients that completed 6 sessions, of these patients 23 had completed 12 sessions. The demographic characteristics are shown on table 1. Results of BF plus transanal EST, baseline versus session 6 and baseline versus session 12 are shown on table 2.

INTERPRETATION OF RESULTS

The main endpoint of the study was the improvement of the constipation at session 6 and at session 12. At session 6 the VAS, the self-reported improvement and the defecations per week changed significantly. Al session 12 the VAS, the self-reported improvement, the defecations per week and the pain during defecation changed significantly. We also compared the self-reported improvement session 6 versus session 12 and we found that the percentage didn't change significantly (p= 0. 089).

CONCLUDING MESSAGE

BF plus transanal EST is an effective treatment for patients with pelvic floor dyssynergia unresponsive to other treatment options and it should be considered as a first line option treatment.

FIGURE 1

Table 1. Demographic characteristics

Parameter	n=34	Range
Age (mean, SD)	45.38±12.99	(20-67)
Parity ((mean, SD)	3.19±1.89	(0-7)
Vaginal deliveries (mean, SD)	2.76±1.52	(0-6)
BMI (mean, SD)	24.57±3.53	(19-33)
Prior surgery		
Hysterectomy n (%)	4(11.76)	
Prolapse surgery n (%)	2(5.9)	
Anorectal surgery n (%)	7(20.6)	

BMI, body mass index.

FIGURE 2

Table 2. Results of BF plus transanal EST. Baseline versus session 6. Baseline versus session 12.

Parameter	Baseline (n=34)	Session 6 (n=34)	P-value	Session 12 (n=23)	P-value
VAS	7.52±2.54	4.97±2.85	**<0.0001**	2.53±2.38	**<0.0001**
Self-reported improvement		60%		72.76	**<0.0001**
Defecations per week(n)	3.2±2.30	9±5.61	**<0.0001**	11.2±5.28	**<0.0001**
Pain during defecation	19 (55.88%)	13 (38.23%)	0.54	3 (13.04)	**0.016**
Use of laxatives	19 (55.88%)	17 (50%)	0.50	11 (47.82%)	1.0

VAS, visual analogue scale.

REFERENCES

1. Sultan AH, Monga A, Lee J, Emmanuel A, Norton C, Santoro G, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female anorectal dysfunction. International Urogynecology Journal. 2016 Oct 24;28(1):5–31.
2. Cadeddu F, Salis F, De Luca E, Ciangola I, Milito G. Efficacy of biofeedback plus transanal stimulation in the management of pelvic floor dyssynergia: a randomized trial. Techniques in Coloproctology. 2015 Mar 6;19(6):333–8.

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PATIENT CHARACTERISTICS ASSOCIATED WITH A CLINICALLY IMPORTANT TREATMENT RESPONSE IN WOMEN UNDER-GOING NON-SURGICAL THERAPY FOR FECAL INCONTINENCE

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HYPOTHESIS / AIMS OF STUDY

To identify clinical and demographic characteristics associated with a clinically important treatment response in women randomized in a 2x2 factorial design to loperamide or placebo and to and anal exercises with biofeedback vs. educational pamphlet for treatment of fecal incontinence (FI).

STUDY DESIGN, MATERIALS AND METHODS

Data were analyzed from the Controlling Anal incontinence by Performing Anal Exercises with Biofeedback or Loperamide (CAPABLe) trial. In this analysis, treatment response was defined in two ways: as a clinically important improvement of -5 points in St. Mark's scores, and as a ≥50% reduction in FI episodes, from baseline to 24 weeks. Multivariable logistic regression models included baseline characteristics and clinical variables significant at p≤0.2 on bivariate analysis, and treatment group. Treatment x predictor interactions were evaluated for one predictor at a time. Adjusted odds ratios (aOR) are presented with 95% confidence intervals (CI).

RESULTS

Overall, mean age was 63.8±11.1 years, 79.3% were White, mean BMI 29.8±7.0 and 85.3% were postmenopausal. Characteristics associated with treatment response on logistic regression analyses are presented in the table. Treatment response by St. Mark's score was independently associated with being overweight (BMI 25 to 29.9) vs normal or underweight (BMI<25), no previous cesarean section (C/S), and higher baseline St. Mark's score. When St. Mark's score was assessed as a continuous variable, there was an estimated improvement at 24 weeks of -0.86 points in the St Mark's score for each 1-point increase in baseline sphincter tone (95% CI -1.42, -0.30) and an improvement of -0.65 points in the St Mark's score for each 1-point increase in baseline score (95% CI -0.80, -0.50). Being in the combined loperamide/biofeedback group vs control (placebo/educational pamphlet) group was independently associated with achieving a 50% reduction in FI episodes.

INTERPRETATION OF RESULTS

Certain clinical and demographic variables were associated with treatment response. Being overweight (compared to normal or underweight), history of C/S and increased clinical severity were associated with a minimally important clinical difference in the St Mark's score. Receiving both active treatments was associated with a 50% reduction in FI episodes.

CONCLUDING MESSAGE

Overweight BMI, no history of C/S, severity of FI symptoms and combined active treatments were associated with treatment response in women randomized to loperamide vs. placebo, and biofeedback vs. education. This information may assist in counseling patients regarding the efficacy and expectations of conservative treatment modalities for women with FI.

FIGURE 1

Multivariable Logistic Regression Analysis Associations of Characteristics Associated With Treatment Response

Characteristic	Adjusted Odds Ratio/Coefficient (95% CI)	P-value: Main predictor effect	P-value: Tx × Predictor
Outcome: St Mark's Clinical Improvement (MID, -5 points)			
Treatment Randomization	-	0.0631	-
Loperamide/Biofeedback vs. Control	2.3 (0.97, 5.6)	0.0595	
Loperamide/Education Only vs. Control	1.0 (0.43, 2.4)	0.9794	
Placebo/Biofeedback vs. Control	1.0 (0.42, 2.4)	0.9978	
BMI (Categorized)	-	0.0659	0.6114
Overweight vs. Normal or Underweight	2.3 (1.1, 4.7)	0.0216	
Obese vs. Normal or Underweight	1.8 (0.90, 3.6)	0.0976	
Cesarean Section: No C-Section vs. Past C-Section	4.5 (1.7, 12.1)	0.0025	0.6906
Vaginal Estrogen Therapy: No vs. Yes	1.5 (0.81, 2.9)	0.1931	0.7033
Anal Sphincter Tone – Squeeze Score at Baseline	1.3 (0.98, 1.6)	0.0755	0.8654
St. Mark's Score at Baseline	1.2 (1.1, 1.3)	<.0001	0.1654
Outcome: 50% Reduction Fecal Incontinence Episodes			
Treatment Randomization	-	0.0004	-
Loperamide/Biofeedback vs. Control	5.0 (1.8, 14.2)	0.0022	
Loperamide/Education Only vs. Control	0.84 (0.34, 2.1)	0.7009	
Placebo/Biofeedback vs. Control	2.0 (0.78, 5.2)	0.1477	
Health Insurance – Other: No vs. Yes	3.2 (1.0, 10.3)	0.0477	0.7590
Connective Tissue Disease: Not Present vs. Present	0.19 (0.02, 1.7)	0.1341	0.9991
Prior Rectal Surgery: No vs. Yes	0.44 (0.16, 1.2)	0.1200	0.9252
Average Leaks/Week	1.0 (0.98, 1.1)	0.3816	0.4791
No Warning Leaks/Week	1.0 (0.92, 1.1)	0.6615	0.7112
St. Mark's Score at Baseline	1.0 (0.96, 1.1)	0.2849	0.0694
MMHQ Severity Score at Baseline	1.0 (0.99, 1.0)	0.7073	0.2303
Fecal Incontinence – Leak Type	-	0.0846	0.6875
Passive vs. Urge	1.1 (0.47, 2.7)	0.7785	
Both vs. Urge	0.48 (0.21, 1.1)	0.0705	

Funding Eunice Kennedy Shriver National Institute of Child Health and Human Development **Clinical Trial** No **Registration Number** ClinicalTrials.gov, NCT01502956 **Subjects** Human **Ethics Committee** Institutional Review Board **Helsinki** Yes **Informed Consent** Yes

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DEVELOPMENT OF THE ICF-INCONTINENCE ASSESSMENT FORM (ICF-IAF) TO IDENTIFY PROBLEMS AND RESOURCES OF PATIENTS WITH URINARY AND / OR FAECAL INCONTINENCE USING THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) OF THE WORLD HEALTH ORGANIZATION: THE FORMAL CONFERENCE FOR THE ADOPTION OF THE 1ST VERSION

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HYPOTHESIS / AIMS OF STUDY

The International Classification of Functioning, Disability and Health (ICF) of the World Health Organization (WHO) is a comprehensive classification with 1454 categories. The ICF is based on the integrative biopsychosocial model of the WHO. This model shows the functioning of the human being as a complex interaction between the state of health and positive and negative influencing factors (facilitators and barriers). The influencing factors of the model are the chapters of ICF: Body Functions, Body Structures, Activities and Participation, as well as Environmental Factors. The chapter Personal Factors has not yet been classified.

The purpose of the use of the ICF in this project was that in addition to the diagnosis, which is classified in the International Classification of Diseases (ICD-10), the state of functional health can also be conceived and gathered.

The ICF based Incontinence Assessment Form (ICF-IAF) will be a disease-specific short form of the ICF and could help to standardize protocols for research and practice. The focus on functional health strengthens the aspect of patient orientation in the examination, planning and evaluation of therapy.

The aim of this consensus conference was to define the first version of the ICF-IAF for individuals with urinary and/ or faecal incontinence, using the results of previous subprojects.

STUDY DESIGN, MATERIALS AND METHODS

The results of preparatory subprojects were analysed in a consensus conference by a panel of six delegates of groupings specialized in pelvic floor therapy of the respective professional associations of physiotherapy from Germany, Austria, and Switzerland, and compiled in consensus into a first version. These studies were integrated into consensus building (Figure 1): An analysis of 27 level-A recommended disease-specific questionnaires (1), a Delphi survey among 262 physiotherapists form 5 German speaking countries (2), as well as the patients' perspectives determined with 8 focus groups (3) and 89 individual interviews (4).

The categories were selected in country-specific groups (Austria, Germany, and Switzerland), each of which created its own list for each chapter of the ICF. Afterwards, joint results were recorded in the plenary session and different points of view were discussed. The final inclusion of the individual categories in the first version of ICF-IAF was decided by consensus.

RESULTS

The six delegates from the three countries reached a consensus and adopted the first version of ICF-IAF with a total of 65 categories. For Body Functions 24 categories were included, for Body Structures 13, for Activities and Participation 18 and for Environmental Factors 10. A consensus was reached in all cases of discussion.

INTERPRETATION OF RESULTS

In this consensus conference a first version of the ICF-IAF for individuals with urinary and/ or faecal incontinence has been developed. It can be used worldwide immediately after publication. The more than 100 existing translations of ICF allow application in many countries.

CONCLUDING MESSAGE

The first version of ICF-IAF will be available after publication and will contribute to the patient-oriented assessment of functional health. It will help to standardize protocols of research and practice.

FIGURE 1

Figure 1: Phases of the development of the ICF – Incontinence Assessment Form (IAF)

REFERENCES

1. Kuhn M, Gass S, Radlinger L, Koehler B. The ICF-Incontinence Assessment Form (ICF-IAF) to identify problems and resources in patients with urinary and / or faecal incontinence: Subproject the patients' perspective. 46th annual meeting of the International Continence Society ICS. 2016;13th-16th September:Tokyo.
2. Koehler B. The International Classification of Functioning, Disability and Health (ICF) as an assessment tool. The Official Newsletter of the International Urogynecological association IUGA. 2016;Volume 11(Issue 2):11.

3. Organization WHO. International Classification of Functioning, Disability and Health: Short Version: ICF. Eds.: 1. Geneva: World Health Organization; 2001.

Funding selffunded and Pelvisuisse e.V. **Clinical Trial** No **Subjects** Human **Ethics not Req'd** Expert oppinion was in focus **Helsinki** Yes **Informed Consent** No

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STIGMA ASSOCIATED WITH PELVIC FLOOR DISORDERS

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HYPOTHESIS / AIMS OF STUDY

Although the impact of stigma is known for women with urinary incontinence, it has not been well studied among the full spectrum of pelvic floor disorders. The goal of this study was to quantify the level of stigma in a population of women presenting for urogynecologic care, using a validated stigma scale. The secondary aim of this study is to test the hypothesis that stigma related to pelvic floor disorders results in a delay in care seeking for these problems.

STUDY DESIGN, MATERIALS AND METHODS

This was a prospective survey study of women presenting for new patient visits in a pelvic floor disorder clinic, including clinics for Female Pelvic Medicine and Reconstructive Surgery and a multidisciplinary bowel control clinic, between May 2017 and February 2018. All new patients were offered an anonymous survey including two validated questionnaires (Stigma Scale for Chronic Illnesses 8-item version (SSCI-8) and Pelvic Floor Bother Questionnaire (PFBQ)) to complete before their visit. The SSCI-8 is an eight item questionnaire measure which assesses multiple aspects of stigma, and scores can range from 8-40. Raw sum scores were calculated for each survey. The Kruskal-Wallis test was used to compare the distributions of stigma scores by response. Logistic regression was used to model factors associated with a delay in seeking care. Spearman correlation was used to determine whether there was an association between SSCI-8 score and PFBQ score.

RESULTS

A total of 523 completed questionnaires were collected within the study period. Women presenting with complaints of urine leakage (UI), accidental bowel leakage (ABL) and constipation had significantly higher SSCI-8 (stigma) scores than those presenting with pelvic organ prolapse (POP). Women presenting with ABL had the highest median stigma score (14) of all the groups (plot 1). Total stigma score had a moderately positive correlation (0.5) with PFBQ score. Additional factors significantly associated with a higher stigma score were age <50 years and seeking medical care in <1 year from symptom onset. Length of time living with the problems, having friends or family with similar problems, and education level were not significantly associated with stigma level. In a logistic regression model, urine leakage was significantly associated with an increase in odds of waiting 1 year or more to seek care (OR=3.02, 95% CI=1.51-6.03) while lower stigma score was associated with a decrease in odds of waiting 1 year of more to seek care (OR=0.92, 95% CI=0.86-0.98).

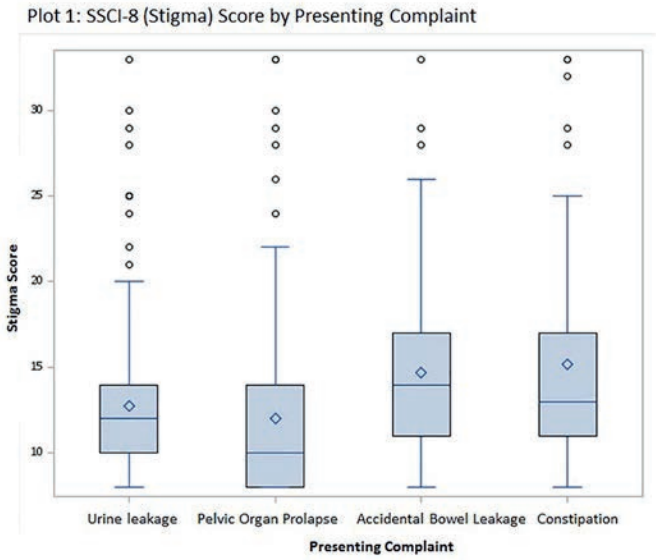
INTERPRETATION OF RESULTS

Pelvic floor disorders carry varying levels of stigma. ABL is associated with the highest level of stigma while POP is associated with the lowest. Median stigma scores among patients with UI, ABL and constipation were similar to published scores for people living with chronic neurological conditions, the population in which the SSCI-8 was developed and validated. Level of stigma was found to have a moderately positive correlation with overall presence and degree of bother of pelvic floor symptoms as measured by the PFBQ. Younger patients were found to have higher levels of stigma; however, having friends or family with a similar condition did not affect stigma level. Our population had a higher level of education than average, but education level was found to not affect stigma level. On logistic regression, the only presenting complaint associated with delay in seeking care was urinary incontinence; moreover, a higher stigma score increased the odds of seeking care earlier.

CONCLUDING MESSAGE

Among women with pelvic floor disorders, those presenting with urine leakage, accidental bowel leakage and constipation report higher levels of stigma than those presenting with pelvic organ prolapse. Younger age is associated with higher stigma, but education level and having friends and family with similar problems do not affect stigma level. These results suggest that we should reject the hypothesis that stigma results in delayed care-seeking; rather, women who feel more stigmatized by pelvic floor disorders appear to seek care earlier.

FIGURE 1



REFERENCES

1. Molina, Y., Choi, S. W., Cella, D., & Rao, D. (2013). The stigma scale for chronic illnesses 8-item version (SSCI-8): development, validation and use across neurological conditions. Int J Behav Med, 20(3), 450-460. doi: 10.1007/s12529-012-9243-4
2. Peterson, T. V., Karp, D. R., Aguilar, V. C., & Davila, G. W. (2010). Validation of a global pelvic floor symptom bother questionnaire. Int Urogynecol J, 21(9), 1129-1135. doi: 10.1007/s00192-010-1148-7

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** This study was IRB exempt (University of Michigan Health Sciences and Behavioral Sciences IRB #HUM00131050) **Helsinki** Yes **Informed Consent** Yes

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PREDICTING OBSTETRIC ANAL SPHINCTER INJURIES (OASIS) IN WOMEN WHO UNDERGO VAGINAL BIRTH AFTER CESAREAN SECTION (VBAC)

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HYPOTHESIS / AIMS OF STUDY

Our objectives were threefold: To (1) identify risk factors associated with obstetric anal sphincter injuries (OASIS) in women undergoing vaginal birth after cesarean section (VBAC), (2) determine if a relationship exists between predicted probability of VBAC success and OASIS and (3) develop a prediction model for OASIS in women who are undergoing VBAC.

STUDY DESIGN, MATERIALS AND METHODS

This was a retrospective case-control study at a single center. Participants had a singleton VBAC between January 2011 and December 2016. Cases were women who sustained OASIS at the time of VBAC. From electronic medical records, we extracted subjects' demographic data, obstetric, and medical history (maternal age, height, body mass index (BMI), reported race or ethnicity, parity, smoking status, indication for prior cesarean section, history of any prior vaginal delivery, history of hypertension and/or diabetes). We also collected data on subjects' intrapartum course and delivery characteristics. Predicted probability of VBAC success was calculated using the Maternal Fetal Medicine Units (MFMU) Network Vaginal Birth After Cesarean calculator [1]. Univariate analyses were performed using statistical analyses as appropriate to identify antepartum and intrapartum variables significantly associated with OASIS. These variables were then used to create the most parsimonious prediction model using a significance threshold of 0.15 for inclusion and backward stepwise logistic regression. A second model was generated by substituting the VBAC success in place of variables used in its generation. Pseudo R2 and AIC values were used to compare models. Data was analyzed using Stata 11.2 (Stata- Corp, TX, USA) and SPSS (Version 20, Chicago IL).

RESULTS

1411 women met inclusion criteria. 73 (5.2%) sustained OASIS at the time of VBAC; 2.8% occurred with spontaneous VBAC, 30.1% with forceps-assisted VBAC and 13.3% with vacuum assisted VBAC, p=0.001 (Table 1). On univariate analysis, OASIS was associated with operative vaginal delivery and episiotomy (OR 12.74, 95% CI 7.72 - 21.03 p<0.001 and OR 3.79, 95%CI 1.71-8.41, p= 0.003 respectively), while African American race and predicted VBAC success probability of >75% were associated with decreased odds of OASIS (OR 0.22, 95% CI 0.71- 0.73 and OR 0.43, 95% CI 0.25- 0.76, p<0.05 respectively). On multivariable logistic regression, African-American race, episiotomy and operative vaginal delivery maintained significance(Table 2). Substitution of the predicted VBAC success did not improve model goodness of fit. The model demonstrated that African American race (OR 0.17, CI 0.05- 0.58) was protective against OASIS. In contrast, episiotomy (OR 3.39, 95% CI 1.34- 8.58), forceps delivery (OR 15.73, 95% CI 9.14-27.05) and vacuum delivery (OR 3.59, 95% CI 1.07-12.0) were significant risk factors for OASIS (Table 2). Our model also demonstrated that the use of forceps increased the probability of OASIS by 10-fold in Caucasian women who undergo VBAC (3.4% vs 35%).

INTERPRETATION OF RESULTS

In women who undergo VBAC the use of forceps conferred the highest odds for OASIS. Forceps delivery at the time of VBAC carries up to a 30% increase risk of OASIS. African American race and predicted probability of VBAC success greater than 75% were protective against OASIS at the time of VBAC.

CONCLUDING MESSAGE

Factors that are predictive of OASIS in women who undergo VBAC were identified. Forceps-assisted vaginal delivery was associated with the highest odds for OASIS.

FIGURE 1

Table 1: Incidence of OASIS in Women Undergoing VBAC

		No OASIS	OASIS
Mode of delivery	Spontaneous VBAC	97.2%	2.8%
	Forceps- assisted VBAC	69.9%	30.1%
	Vacuum- assisted VBAC	86.7%	13.3%

FIGURE 2

Table 2: Factors Associated with OASIS in Women Undergoing VBAC in Multivariable Logistic Regression

Psuedo R2= 0.20

		Adjusted Odds Ratio	p-value	95% Conf. Interval	
Race/Ethnicity	African American	0.17	0.005	0.05	0.58
	Hispanic	0.66	0.205	0.35	1.25
Episiotomy		3.39	0.010	1.34	8.58
Mode of delivery	Forceps Delivery	15.72	0.039	9.14	27.05
	Vacuum Delivery	3.59	0.000	1.07	12.07

MODEL EQUATION: Logit(p)= -3.378-1.753 (African American race)- 0.412196(Hispanic) + 1.223(Episiotomy) + 2.755 (forceps delivery)+ 1.279 (Vacuum delivery)

REFERENCES

1. Grobman, W.A., et al., Development of a nomogram for prediction of vaginal birth after cesarean delivery. Obstetrics and gynecology, 2007. 109(4): p. 806-12.

Funding None **Clinical Trial** No **Subjects** Human **Ethics Committee** Northwestern University Institutional Review Board **Helsinki** Yes **Informed Consent** No

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SEXUAL FUNCTION IN WOMEN AFTER SPINAL CORD INJURIES (SCI)

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HYPOTHESIS / AIMS OF STUDY

Data on female sexual function following spinal cord injury are limited. There are validated questionnaires to evaluate female sexual health but none specifically for SCI patients. Achieving an acceptable level of sexual satisfaction is multi-factorial, with areas highlighted including; sensory loss, impaired bladder and bowel control, orgasm, pain, lubrication, feeling ashamed or less attractive, mobility, low mood.

SCI patients are often dissatisfied with the quantity and quality of information provided to them during rehabilitation. Patient's needs are highly individual, with timing of advice critical to reception. We feel that information and support provided to female SCI patients during rehabilitation could be improved.

The aim of our study was to evaluate the level of satisfaction with our current sexual health service with regard to female SCI patients. Our secondary aim was to analyse what is important to women following their SCI and what impacts upon their sexual health.

STUDY DESIGN, MATERIALS AND METHODS

We invited women with SCI in our unit to complete two questionnaires; one about the information given to them at the time of their SCI and whether they were satisfied with it, and the PISQ-IR: sexual function for women with pelvic organ prolapse, urinary incontinence and/or fecal incontinence, a validated sexual health questionnaire. We excluded women who were in their first year after SCI.

RESULTS

Thirty-four patients completed the questionnaire, with a mean age of 52 years (range 25-83). There were a range of injury levels from C4 to S1. Average length of time from injury was sixteen years (range 1-43). Main methods of managing their bladders; supra-pubic catheters (11/34), intermittent self-catheterisation (11/34), four had undergone bladder augmentation. Three had stomas for bowel management, while the rest used a mixture of manual evacuation and laxatives. Twenty had pregnancies pre-injury, and 6 had pregnancies after SCI, all of them needed medical intervention (such as forceps, ventouse or elective c-section)

14/34 received information after their injury regarding sexual function; nine patients felt they had adequate opportunity to discuss this subsequently. The majority of this information was not received until they reached a specialised spinal unit. The quality of the information they received was rated as 7/10.

28/34 patients resumed sexual activity after SCI, this occurred on average 6-12 months after injury. 9/28 women who did resume sexual activity had no orgasms and 7/28 had less intense orgasms. 14/28 felt usually to almost always sexually fulfilled during sexual activity. 9/28 rated their sexual desire or interest from low to very low or none at all. Satisfaction levels of those that did re-engage was 7/10 on a Likert scale.

Reasons for not engaging in sexual activity included no partner (57%), libido (61%), incontinence (58%), other health problems (50%), and pain (53%). 45% of women were bothered by the fact that they weren't sexually active.

INTERPRETATION OF RESULTS

Several women found the amount of information given to them at the time of SCI was overwhelming, and too much to take in. Many suggested a single point of contact to ring when they were ready to talk about their sexual health, and one suggested regular e-mails with invitations to talk about their sexual health. Overall 44% of patients would have liked more information regarding sexual function after injury and many felt a one-to-one session would have been preferable.

CONCLUDING MESSAGE

Specific advice and guidance for patients regarding sexual function should be dependent upon level of injury and an individualised approach is recommended. Group sessions are not always appropriate due to the sensitive nature of the issues patients may wish to discuss. A women's view to her sexual health will change over the years post SCI, and it is important to revisit their sexual health periodically.

Funding None **Clinical Trial** No **Subjects** Human **Ethics not Req'd** It was part of a quality improvment project in our trust and did not require ethcical approval **Helsinki** Yes **Informed Consent** Yes

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THE INFLUENCE OF COGNITIVE-BEHAVIORAL PSYCHOTHERAPY ON THE SEXUAL FUNCTION AND QUALITY OF LIFE OF WOMEN WITH SEXUAL DYSFUNCTION: PRELIMINARY RESULTS OF THE RANDOMIZED CLINICAL TRIAL USING QUANTITATIVE AND QUALITATIVE METRICS.

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HYPOTHESIS / AIMS OF STUDY

Many initiatives and advances have existed in the world in the attempt to demystify the theme of sexuality, however, it continues to be surrounded by a series of paradigms and taboos that end up influencing the sexual health of all people, especially women because of historical issues , which involves the development of sexuality in this genre. Cognitive-behavioral psychotherapy (CBT) is a psychotherapeutic approach that favors the restructuring of dysfunctional thoughts and beliefs and, although it is indicated as effective in the treatment of female sexual dysfunctions, no research has been found to prove its efficacy when compared to sexual education. Thus, this study raises the hypothesis that CBT can have a positive impact on the treatment of sexual dysfunctions with repercussions on the perception of improvement in the quality of life of the women served in this protocol.

STUDY DESIGN, MATERIALS AND METHODS

Randomized Clinical Trial that made an evaluation of the results using two methods: qualitative (Content Analysis) and quantitative. Women between the ages of 18 and 59 years old were referred by a gynecologist with a diagnosis of Psychogenic Sexual Dysfunction and with a FSFI score of less than or equal to 26. Those with BECK (BDI, BAI and BHS) scores were excluded from moderate to moderate and severe, patients with other diseases of the pelvic floor and with diagnostic suspicion of other psychiatric pathologies.

Protocol of Intervention:

The Control Group protocol consisted of an Initial Individual Evaluation, 8 individual sessions of sex education in which the patients were informed about: physiology of the male and female genital organs, the relevance of positions in sexual relations, the importance of body self-focus, genital self-focusing, masturbation, cultural aspects that interfere with sexuality and sexual function, the difference between sexual function and sexuality, and a Final Individual Evaluation. These encounters occurred weekly and had an average duration of 30 minutes.

The Intervention Group consisted of an Initial Individual Evaluation, 08 sessions of Cognitive-Behavioral Psychotherapy, based on the principles and techniques of CBT

(Psychoeducation, Identification and Restructuring of Automatic Thoughts, Identification and Restructuring of Intermediate and Central Beliefs, Prevention of Relapse) and a Final Individual Evaluation. The sex education procedure was included in the protocol of this group and occurred at the beginning of the CBT sessions. These encounters occurred on a weekly basis and averaged 50 minutes in duration.

Data collect

In the Qualitative Study (content analysis), the semi-structured interview was used as data collection technique, since each session of both groups had pre-established guiding topics to guide the researcher throughout the service.

The Quantitative Study used the FSFI numerical scores and their domains, as well as the numerical scores of the Beck scales (BDI, BAI and BHS) applied before and after the test.

Data analysis:

In the Qualitative Study, six main categories were selected to be analyzed, since they were considered of greater relevance for the establishment of the quality of life of the studied population. They are: Sexual Education, Affective / Conjugal Area, Family Context, Social Area / Recreation, Body Image / Self Care and Sexual Function.

In the Quantitative Study the Mann-Whitney Test was used for the statistical analysis of numerical scores of the FSFI and its Domains, as well as the numerical scores of the Beck Scales (BDI, BAI and BHS) before and after intervention.

RESULTS

Qualitative Methodology:

From the Qualitative Methodology (content analysis), it was observed that: All the patients (n = 21) reported not having sexual education, they presented impairment of the category Sexual Function, as well as in the Social / Leisure area.

Intervention Group (n = 11): Regarding the social / leisure area, it was observed that throughout the visits all patients (n = 11) started to include this type of activities in their daily lives. In the category Body image & self care, nine patients (n = 09) demonstrated an increase in the relation of care and satisfaction with regard to their body. Throughout the CBT process, it was found that all patients (n = 11) in the intervention group started to develop the activities of genital self-focusing with regularity in their life dynamics. Nine women (n = 09) underwent masturbation and / or improvement in FS. Regarding the affective / marital area, two women (n = 02) developed strategies and sought self-protection measures to cope with their partner's aggressive behavior, five (n = 05) began to identify affinities with their partners, favoring the

development of recreational activities between the couple. Six women (n = 06) reported that they began to plan for the future together with their partner. With regard to the Family Context it was possible to

perceive that the patients developed a greater assertiveness in the interpersonal relations with close relatives (parents, brothers, children, husbands).

Control Group (n = 10): No relevant changes were observed in the patients' discourse regarding thoughts, emotions and behavior in relation to the Social / Leisure Areas; affective / conjugal; Family context. Regarding Body Image & self-care, only one (n = 01) reported having initiated genital self-focusing activities. When the patient was questioned about the Sexual Function, none of the patients reported improvement.

Quantitative Methodology:

Considering the quantitative methodology, statistical significance was not revealed for FSFI (general score) and its FSFI domains (Desire, excitation, lubrication, orgasm, satisfaction, Pain), as well as, there was no statistically relevant difference in the scales analysis BECK (BDI, BAI, BHS). Mann-Whitney test was used to perform the data analysis.

INTERPRETATION OF RESULTS

Qualitative Analysis:

The results of the qualitative analysis point to a great influence of CBT in the rehabilitation of aspects of the life of women in the intervention group, represented in this study by the categories: Sexual Education, Affective / Conjugal Area, Family Context, Social Area / Leisure, Body Image / Self Care and Sexual Function. Based on the discourse analysis of the study participants, it was possible to perceive that this change is directly related to the cognitive restructuring that starts to generate more functional thoughts and emotions and, therefore, physiological reactions and behaviors more coherent with these and with the personal goals of the patient.

Quantitative analysis:

The fact that the quantitative analysis did not reveal statistical significance between the FSFI scores (general and domains), as well as the Beck scales (BDI, BAI and BHS), is directly related to the power of this sample, since it is a study preliminary, the N established in the sample calculation of the project has not yet been reached.

However, the data of this research point to the need to use qualitative and quantitative methods for psychological and subjective issues, since they have historical, social, cultural, economic and political determinations, and the use of a quantitative methodology would make aspects of extreme relevance to the quality of life and sexual function not be perceived, studied and considered.

CONCLUDING MESSAGE

Using the qualitative method (content analysis), the Positive Influence of CBT in the rehabilitation of the categories analyzed in this study (Sexual Education, Affective / Conjugal Area, Family Context, Social Area / Leisure, Body Image / Self Care and Sexual Function), due to the cognitive restructuring of dysfunctional beliefs.

However, from the quantitative analysis it is evident the necessity of a sample with more power for more precise conclusions.

REFERENCES

1. YILDIZ, G. & CAVKAYTAR,A. Effectiveness of a Sexual Education Program for Mothers of Young Adults with Intellectual Disabilities on Mothers' Attitudes Toward Sexual Education and the Perception of Social Support. - Sexuality and Disability: March 2017, V. 35, Issue 1.
2. BUTER,A.; CHAPMAN,J.E.; FORMAN,E.M.;BECK,A.T. The empirical status of cognitive-behavioral therapy: A review of meta-analyses - Clinical Psychology Review: January 2006, V. 26, Issue 1, Pages 17–31.
3. Young, E.J.; Klosko S.J. & Weishaar, E.M. Schema Therapy & - A Practtioner's Guide: 2003, New York & London: The Guijford Press

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