

W15: Neurodegenerative disease's impact on bladder function: A multidisciplinary approach in diagnosis, treatment and improving quality of life

Workshop Chair: Christian Cobreros, Argentina

03 September 2019 14:00 - 15:30

Start	End	Topic	Speakers
14:00	14:10	Understanding clinical differences in neurodegenerative diseases	Christian Cobreros
14:10	14:15	Discussion	Christian Cobreros David Castro-Diaz Carlos D'Ancona Gustavo Garrido
14:15	14:25	Urodynamic Assessment in This Population. When? Why? Are There Any Other Diagnostic Methods That You Should Use?	Gustavo Garrido
14:25	14:30	Discussion	Christian Cobreros David Castro-Diaz Carlos D'Ancona Gustavo Garrido
14:30	14:40	Is it always easy to differentiate urgency from another clinical presentation of these patients? How can we avoid over medication?	David Castro-Diaz
14:40	14:45	Discussion	Christian Cobreros David Castro-Diaz Carlos D'Ancona Gustavo Garrido
14:45	14:55	Oral medication. What do we have today? Is combination better? How to decide when to move to another step?	Christian Cobreros
14:55	15:00	Discussion	Christian Cobreros David Castro-Diaz Carlos D'Ancona Gustavo Garrido
15:00	15:10	Surgical Approach: Botulinum toxin, NTS, Neuromodulation	Carlos D'Ancona
15:10	15:15	Discussion	Christian Cobreros David Castro-Diaz Carlos D'Ancona Gustavo Garrido
15:15	15:25	Bladder Outlet Obstruction in Neurodegenerative Patients	Gustavo Garrido
15:25	15:30	Discussion	Christian Cobreros David Castro-Diaz Carlos D'Ancona Gustavo Garrido

Aims of Workshop

In the past decades, the aim of the urologist was to treat the neurogenic bladder dysfunction through antimuscarinics and surgical procedures (e.g. bladder augmentation). More recently, new drugs have been approved and new surgical procedures have been developed, but more importantly a new role for the multidisciplinary approach has been established. We will encourage this new concept of treatment to the audience, taking into account differences in incomes of different societies. This a new workshop based on the state of the art knowledge and latest techniques that are available and with an international pannel of experts we will extent our experience in working under different economic circunstances

Learning Objectives

Identify the different patterns of neurological bladdder impacts of neurologic diseases.

Target Audience

Urology, Conservative Management

Advanced/Basic

Intermediate

Suggested Learning before Workshop Attendance

- ICS teaching module: Cystometry (basic module).
- ICS teaching module: Analysis of voiding, pressure flow analysis (basic module).
- ICS Workshop 2015: SUPPORTING SELF-MANAGEMENT OF THE NEUROGENIC BLADDER
- Neurourol Urodyn. 2017 Nov 17. An International Continence Society (ICS) report on the terminology for adult neurogenic lower urinary tract dysfunction (ANLUTD).
- Eur Urol. 2014 Feb;65(2):389-98. Detrusor underactivity and the underactive bladder: a new clinical entity? A review of current terminology, definitions, epidemiology, aetiology, and diagnosis.
- Curr Urol Rep. 2014 Sep;15(9):433. UTIs in patients with neurogenic bladder.
- Eur Urol. 2014 May;65(5):981-90. doi: 10.1016/j.eururo.2013.10.033. Epub 2013 Nov 1. An updated systematic review and statistical comparison of standardised mean outcomes for the use of botulinum toxin in the management of lower urinary tract disorders.
- Int Urogynecol J. 2017 Feb;28(2):191-213. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for the conservative and nonpharmacological management of female pelvic floor dysfunction.
- Neurourol Urodyn. 2017 Jun;36(5):1243-1260. Epub 2016 Dec 5. Review. International Continence Society Good Urodynamic Practices and Terms 2016: Urodynamics, uroflowmetry, cystometry, and pressure-flow study.
- Cochrane Database Syst Rev. 2014 Sep 23;(9):Types of indwelling urethral catheters for short-term catheterisation in hospitalised adults.
- Cochrane Database Syst Rev. 2015 Dec 10;(12):Urethral (indwelling or intermittent) or suprapubic routes for short-term catheterisation in hospitalised adults.
- Cochrane Database Syst Rev. 2017 Aug 8;8:WITHDRAWN: Intermittent catheterisation for long-term bladder management.
- Cochrane Database Syst Rev. 2013 Nov 18;(11): Review. Catheter policies for management of long term voiding problems in adults with neurogenic bladder disorders.

Understanding clinical differences in neurodegenerative diseases

Christian Cobreros

Understanding clinical presentations in lower urinary tract dysfunction due to neurological disorders is very challenging. Nevertheless, we do know that a wide variety of neurological conditions, acute or chronic, may affect the functionality of the bladder, or sphincter, or the pelvic floor musculature innervation resulting in different conditions as well as similar ones. Their clinical presentations are determined by the site and the nature of the lesion.

In a simple classification, but a very useful one, is to base the clinical urodynamic findings in terms of the lesion level, we also expected classical symptoms for each level:

- Suprapontine lesion: detrusor over activity due the lack of cortical inhibition, so storage symptoms are to be expected.
- Pontine micturition: if its preserved the control of the coordination of detrusor –sphincter mechanism will be preserved, as this center is the responsible for the coordination of the relaxation of the sphincter and pelvic floor musculature during bladder contraction
- Infrapontine-suprasacral lesions: this patient may present with a variety of clinical presentations due to a complete or partial lesion, in case of cortex and coordinated signal from the pontine center are injured the patient could present with neurogenic and detrusor over activity and sphincter dyssynergia
- Sacral micturition center: when this center is compromise we should expect involuntary contractions of the bladder as if it is a reflex center for bladder contractions
- Infrapontine lesions: In these lesions, even the reflex bladder contractions are lost due to an interruption of the signals between the bladder and all micturition centers, which will result in a clinical manifestation of a neurogenic detrusor underactivity or areflexic detrusor or even a sphincter deficiency.

Although this systematic and practice review of lesion level of neurogenic urological disease the clinical presentations in neurodegenerative diseases may vary from presented above, and this classification although its more useful in traumatic lesions but in the clinical practice in neurodegenerative diseases we should expected some evolution of the clinical presentations and in some cases a completed different pattern within the clinical evaluation due to a progressive neurological disease.

Suprapontine Lesion (Brain)

Cerebrovascular Accident (Stroke)

- acute phase of CVAs patients
- post-acute (chronic) phase of stroke

- LUT dysfunction following stroke

Degeneration disease and syndromes

- Parkinsonian Syndrome
- Multiple System Atrophy
- Alzheimer disease
- Intracranial tumors

Spinal cord : Infrapontine-Suprasacral lesions

- Demyelination (multiple sclerosis, transverse myelitis)

Spinal Cord and Peripheral Nervous System: Sacral-Infrasacral Lesion

- Intervertebral Disk Prolapse
- Peripheral Neuropathies (Diabetes Diabetes mellitus , radiation therapy)

Urodynamic assessment in this population. When? Why? Are there any other diagnostic methods that you should use? **Gustavo Garrido**

Neurodegenerative disorders (ND) such as Parkinson's Disease (PD), Alzheimer Disease (AD), Multiple Sclerosis (MS), Multisystemic Atrophy (MSA) and other forms, are systemic diseases which leads to loss of control of various motor and non-motor systems including the lower urinary tract. They are chronic and progressive challenging clinical entities which severely affects quality of life. Frequently associated with lower urinary tract dysfunction like urinary incontinence, nocturia or urinary retention, they often lead to complications like dermatitis, urinary tract infections, social retraction and could be the reason for early institutionalization.

ND and Benign Prostate Hyperplasia (BPH) is highly prevalent in late middle-aged men, as Urinary Incontinence (UI) is in middle-aged women, making the chance of concomitance of both pathology highly probable. This situation is a complex picture for decision making.

Urodynamic studies are a useful diagnostic approach for understanding bladder and urethral dysfunction associated with neurodegenerative disorders.

Overactive detrusor is the most common finding in urodynamic tests, however weak or absent voluntary detrusor function is also a common finding. Findings like Detrusor-sphincter dyssynergia (DSD) is not uncommon. And half of the patients with PD have mild urethral obstruction, due to impaired relaxation or delayed striated sphincter relaxation (also known as Sphincter bradykinesia). In addition, the DSD is present in almost half of patients with MSA and Detrusor Hyperactivity during bladder filling phase with Impaired Contraction during voiding (DHIC) is not uncommon.

Differentiating among different urodynamic conditions is particularly important for the evolution and prognosis of lower urinary tract symptoms (LUTS), especially during the early course of the disease.

Urodynamic investigations in patients with ND is crucial for a correct diagnosis that leads to a better comprehension about the physiopathology of such complex diseases.

Is it always easy to differentiate urgency from another clinical presentation of these patients (e.g. pain, hypersensitivity, bladder irritation, infection)? How can we avoid over medication?

David Castro-Diaz

Many different conditions affecting the lower urinary tract function origin in the nervous system and it is important to recognise that lower urinary tract symptoms (LUTS) may be one of the first signs of neurodegenerative disorders such Alzheimer's disease (AD), Parkinson's disease (PD), dementia and PD-related disorders, Huntington's disease (HD), Spinocerebellar ataxia (SCA) or Spinal muscular atrophy (SMA).

The symptom "Urgency", defined as "the complaint of a sudden compelling desire to pass urine, which is difficult to defer", is sometimes one of the first symptoms indicating a neurodegenerative disorder which may later lead the patient to a fatal outcome. PD patients and others with neurodegenerative disorders suffer loss of dopaminergic neurons inducing deficit or abnormality of

the neurologic control of micturition. More than 60% of patients with PD have LUTS and 30 % refer urinary incontinence. Patients suffering neurodegenerative disorders often express LUTS and its onset may even serve as a diagnostic marker. Patients with bladder pain syndrome/Interstitial cystitis (BPS/IC) and those with hypersensitive bladder, usually refer the symptom of urgency as linked to pain while patients with neurodegenerative disease or overactive bladder may express urgency as linked to pain to incontinence. However, differentiating urgency from another clinical presentation is not easy particularly in patients with cognitive disorders.

The onset of disease and timescale of symptoms may give clues to the cause of urinary problems. In some cases, LUTS occur early, in the course of disease, whereas in others they may develop later, and could be confused with dysfunctions of a non-neurogenic origin, such as benign prostatic enlargement or bladder outlet obstruction. The extent to which symptoms 'bother' the patient is important and should be determined both subjectively and objectively, through a proper clinical history and the use of a voiding diary, questionnaires and quality of life evaluation. This approach enables us to match therapy with patient's motivation and to monitor the success of treatment. The physical status of the patient will have an important influence on the capabilities for maintaining a therapeutic strategy.

Attention should be paid to any medications taken by the patient, as several drugs can have detrimental effects on the urinary tract. For example, diuretics prescribed for hypertension are associated with bladder overstretching. Furthermore, the use of any antihypertensive agent in younger patients should alert the urologist to the likelihood kidney dysfunction due to obstructive uropathy. Drugs that can alter the functioning of the urinary tract include opiate-containing painkillers, which reduce bowel motility and antiparkinsonian agents which act as parasympatholytics and so impair detrusor contractility. Muscle relaxants used to treat spasticity may also cause bladder hypocontractility and urinary retention; alternatively, they can induce pelvic floor laxity leading to stress incontinence.

Sufferers of neurodegenerative disorders and elderly people require taking multiple medications which may have side effects and unwanted drug reactions. Muscarinic receptors antagonists have been shown to cause cognitive disorders in elderly patients and should be used with caution in patients with neurodegenerative disorders preferably choosing those drugs which do not cross the blood-brain barrier. As some commonly used drugs have antimuscarinic properties it is important to avoid overmedication that may increase the exposure to side effects. Potential signs of overmedication include drowsiness, physical complications like dry mouth and ulcers, confusion, withdrawal from family or friends, hallucinations, dizziness or falls, fractures and seizures.

Oral medication. What do we have today? Is combination better? How to decide when to move to another step?

Christian Cobreros

We will review the most current literature on oral medication for neurogenic bladder to treat not only detrusor overactivity, but also to improve bladder capacity, compliance and to treat urinary incontinence.

Medical therapies will be discussed in this section as we do have another section in which advances therapies as onabotulinum toxin will be discussed.

At the same time we will go into the improvement of quality of life of single drug vs combination and when it's the optimal time to move to the next step.

Drugs that have action in the storage phase

- Antimuscarinic drugs
- Choice of Antimuscarinic agents
- Side-effects
- Why do they have such a great drop out?
- Agonist β_3
- Its combination better ?

Drugs that have action in the pressure flow phase

- Alpha blockers
- Phosphodiesterase inhibitors (PDE5Is)

Drugs with different mechanisms of action

- Detrusor underactivity
- Decreasing bladder outlet resistance
- Increasing bladder outlet resistance

Is combination better?

When to move to the next step?

Surgical approach: neurostimulation, botulinum toxin, neuromodulation, bladder augmentation

Carlos D'Ancona

The surgical approach in neurogenic detrusor overactivity is indicated when failures occur in pelvic floor muscles training and drugs administration. The classification of failure is not well defined but we can consider it to be, when the patient is unsatisfied.

Between neurostimulation, neurotoxin, neuromodulation and bladder augmentation, the question is how to choose one of this? Transcutaneous or percutaneous nerve stimulation is a minimal invasive treatment with good response in patients with multiple sclerosis and Parkinson's disease. The botulinum toxin has the advantage that is reversible after 8 to 12 months. Can be use as test before a definite treatment. The results of BT are excellent improving in symptoms, in urodynamics and Quality of Life. There is still the question for how long it is possible to use this treatment. Many papers show that it is effective for more than 10 years.

For neuromodulation treatment, there should be some neuronal connections between the bladder and brain. So, patients with complete spinal cord injury are not a candidate for implantation of neuromodulation. However, patients with multiple sclerosis and Parkinson disease present good results with a long follow up.

Performing bladder augmentation decreased much due to the other techniques used. This technique presents some adverse effects such as bladder stone, urinary tract infection, perforation of the reservoir and others. The advantages of this technique are the long-term good results. Myelomeningocele and spinal cord injury patients have a great life expectancy and this technique should be considered.

Bladder outlet obstruction in neurodegenerative patients

Gustavo Garrido

Neurodegenerative Disorders (ND) and Lower Urinary Tract Symptoms (LUTS) due to Bladder Outlet Obstruction (BOO) caused by Benign Prostate Hyperplasia (BPH) are very frequent findings in middle-aged men. Different ND can present contrasting urodynamic conditions which makes treatment decision a challenging circumstance.

ND are systemic diseases which involves neuronal degeneration, leading to a loss of control of various motor and non-motor systems, including the lower urinary tract. Motor symptoms such as gait difficulties, postural instability, rigidity and resting tremor are frequent and have a direct impact in LUTS management. LUTS could precede non-motor symptoms like orthostatic hypotension and other motor disorders in early stages of the disease leading to increased urological pharmacological related treatment adverse effects.

Dementia, cognitive impairment and hallucinations are not uncommon in patients with PD and must be taken in account at the time of BOO treatment.

Published data indicate a high incidence of postprostatectomy urinary incontinence in patients with ND and particularly PD, compared to those without ND who undergo surgery. However poor outcomes of patients following prostate surgery might be a result of the inadvertent inclusion of patients with MSA, which are misdiagnose as PD. And more than half of all MSA patients have urinary symptoms before development of motor symptoms, resulting in a risk of inappropriate indication of BPH surgery.

Surgical treatment of patients with ND and comorbid BPH can be performed in selected patients. The correct neurologic diagnosis together with the exact urodynamic condition are crucial in the decision for best treatment strategy.

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