

## OPENING VESICAL PRESSURE: A NEW TEST TO DISCRIMINATE URETHRAL SPHINCTER DEFICIENCY?

### Hypothesis / aims of study

Despite its clinical and prognostic importance urethral sphincter deficiency is not well defined as it lacks a standardised definition and diagnostic parameters. Some authors have reported opening detrusor pressure as a method of evaluating urethral sphincter function. However we believe that opening vesical pressure could better reflect the real pressure exerted to overcome urethral resistance during micturition and may better represent the different methods of voiding in women

The aim of this study was to verify if the opening vesical pressure in a pressure/flow study could determine urethral sphincter deficiency in women with proved urodynamic stress incontinence.

### Study design, materials and methods

We prospectively included women with urinary symptoms. They were all assessed using a specific questionnaire for urinary symptoms and examined by three trained urogynaecologists. All women were submitted to urodynamics. Women presenting with vaginal prolapse  $\geq$  II stage according to ICS POP-Q System were excluded. Previous surgery for urinary incontinence or other pelvic floor disorders was not considered exclusion criteria. Women were divided into three urodynamic diagnosis groups: urodynamic stress incontinence with urethral sphincter deficiency (Group 1), urodynamic stress incontinence related to urethral hypermobility without urethral sphincter deficiency (Group 2) and normal urodynamic (Group 3). We defined urethral sphincter deficiency exclusively in the presence of severe urodynamic stress incontinence, VLPP < 60 cm H<sub>2</sub>O, MUCP < 20 cm H<sub>2</sub>O, when evaluated, and urethral mobility less than 30° at Q-tip test. All women were matched for age, menopausal state, HRT, parity, obstetric history for macrosomia and/or operative deliveries, BMI, previous urogynaecological surgery. The opening vesical pressure at pressure/flow study was compared between the three groups. Statistical analysis was performed with GraphPad Prism version 3.00 for Windows (GraphPad Software, San Diego CA). Continuous variables were compared with Mann-Whitney or Student's t-test as appropriate. Proportions of categorical variables were analyzed for statistical significance by using the Fisher's exact test. A p value < .05 was considered statistically significant.

### Results

From January 2001 to December 2005 we enrolled in this study 145 women: 56 in Group 1, 50 in Group 2 and 39 in Group 3. Table 1 and Table 2 show the comparison between Groups 1 and 2 and between Groups 2 and 3 respectively for demographic and historical characteristics.

Table 1: comparison between groups 1 and 2 for age, parity, BMI (all expressed as median and range), menopausal state, HRT, obstetrical history for macrosomia, operative deliveries and previous surgery (all expressed as absolute number and percentage)

	Group 1 (n = 56 pts)	Group 2 (n = 50 pts)	P
Age	61 (27-78)	55.5 (33-82)	0.16*
Parity	2 (0-5)	2 (0-5)	0.34§
BMI	25.5 (18-39)	25 (19-41)	0.59*
Menopausal state	47 (84%)	37 (74%)	0.23°
HRT	13 (28%)	12 (32%)	1.0°
Macrosomia	15 (27%)	10 (20%)	0.49°
Operative deliveries	8 (14%)	11 (22%)	0.32°
Previous surgery	17 (30%)	12 (24%)	0.52°

(\* t-test °Fisher's exact test § Mann-Whitney)

Table 2: comparison between groups 1 and 3 for age, parity, BMI (all expressed as median and range), menopausal state, HRT, obstetrical history for macrosomia, operative deliveries and previous surgery (all expressed as absolute number and percentage)

	Group 1 56 pts	Group 3 39 pts	P
Age	61 (27-78)	59 (37-78)	0.16*
Menopausal state	47 (84%)	26 (66%)	0.08°
HRT	13 (28%)	10 (38%)	0.81°
Parity	2 (0-5)	2 (0-8)	0.47§
Macrosome	15 (27%)	8 (20.5%)	0.62°
Operative deliveries	8 (14%)	6 (15%)	1.0°
BMI	25.5 (18-39)	25 (19.5-34.5)	0.31*
Previous surgery	17 (30%)	6 (15%)	0.14°

(\* t-test °Fisher's exact test § Mann-Whitney)

Tables 3 and 4 show the values of the opening vesical pressures comparing groups 1 and 2 and groups 1 and 3 respectively

Table 3: comparison between group 1 and 2 for opening vesical pressure (expressed as median value and 95% Confidence Intervals)

	Group 1	Group 2	P
Vesical opening Pressure	17.5 (15.6-22.2)	30 (27.0-37.3)	<0.0001*

(\* t-test )

Table 4: comparison between group 1 and 2 for opening vesical pressure (expressed as median value and 95% Confidence Intervals)

	Group 1	Group 3	P
Vesical opening Pressure	17.5 (15.6-22.2)	30 (30.6-44.2)	<0.0001*

(\* t-test )

When we compared opening vesical pressure of groups 2 and 3 we did not find any significant difference.

Interpretation of results

Opening vesical pressure should reflect the pressure exerted by the bladder to overcome urethral resistance. However the data of this study shows that women with intrinsic sphincter deficiency have significantly lower opening vesical pressures than continent controls or women with urodynamic stress incontinence who have bladder neck hypermobility.

Concluding message

Opening vesical pressure is a new promising parameter to detect intrinsic urethral sphincter deficiency. Large prospective studies, stratified by age and UDS conditions, should be carried out to confirm these interesting findings.

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**CLINICAL TRIAL REGISTRATION:** This clinical trial has not yet been registered in a public clinical trials registry.

**HUMAN SUBJECTS:** This study did not need ethical approval because part of normal clinical activity but followed the Declaration of Helsinki Informed consent was obtained from the patients.