

CAN WE DEVELOP AN OBJECTIVE URODYNAMIC DETRUSOR OVERACTIVITY SEVERITY SCALE?

Hypothesis / aims of study

Detrusor overactivity (DO) can be demonstrated in 44% of women with symptoms of overactive bladder syndrome (OAB) (1). Validated disease specific health related quality of life (HRQoL) questionnaires and urgency scales are used to demonstrate the severity of OAB. However, as previous studies have been unable to quantify the severity of DO on the basis of the urodynamic parameters, the 5th International Consultation on Incontinence has recommended the development of an objective and cystometry-based DO severity scale. The aim of this study was to identify urodynamic variables, which could be included in a DO severity scale.

Study design, materials and methods

This was a cross-sectional study in a tertiary referral urodynamic unit. Consecutive women with idiopathic DO were included in the study. The participants underwent multichannel urodynamics according to the ICS recommendations (2). Filling cystometry was performed in the supine position at a rate of 100 mls / min. Filling was stopped when the patient developed a strong desire to void or 500 ml of fluid had been infused into the bladder, whichever occurred first. The patient was then moved to the standing position and provocative manoeuvres (coughing, running water and hand-washing) were performed.

A literature review and a group discussion with ten expert urodynamicists identified the variables, which were likely to relate to the severity of DO. These included:

- cystometric capacity
- compliance
- amplitude of the first involuntary detrusor contraction
- amplitude of the highest involuntary detrusor contraction
- threshold volume for the first detrusor contraction
- leakage per urethram associated with a detrusor contraction
- spontaneous or provoked DO

All women were asked to complete a 3-day bladder diary incorporating the Patient's Perception of Intensity of Urgency Scale (PPIUS) (3) and a King's Health Questionnaire (KHQ). The five grades of the PPIUS (from 0: no urgency, to 4: urgency incontinence) were used to assess the degree of urgency associated with each void. Urgency episodes were counted as voids with PPIUS level 3 and 4 (without or with urgency incontinence respectively). The domains of the KHQ were scored on a 0 (best) to 100 (worst) scale. The 24-hour urgency episodes and the score of the incontinence impact (II) domain were used to assess the severity of OAB.

SPSS (V 20) was used for statistical analysis and $p \leq 0.05$ was considered as statistically significant. Kendall's tau-b correlation and Mann Whitney U test were used to estimate the association between the urodynamic variables and the II domain score and 24-h urgency episodes.

Results

299 consecutive women with DO were included in the study. The mean age was 53.3 years (SD: 15.8), the mean BMI was 29.0 (SD: 6.5) and the median parity 2 (Inter-Quartile Range: 1-3). 158 (53%) of them were postmenopausal and the majority were White Caucasian (54%).

100 participants were diagnosed with spontaneous DO and 199 with provoked DO. Descriptive statistics of the urodynamic variables are presented in table 1.

Table 1

	Median	IQ Range
Cystometric capacity (ml)	404	348-500
Compliance (ml/cm H ₂ O)	46	29-84
Amplitude of first detrusor contraction (cm H ₂ O)	15	10-33
Amplitude of highest detrusor contraction (cm H ₂ O)	32	21-47
Threshold volume for detrusor contraction (ml)	397	295-500

The cystometric capacity, compliance and the threshold volume for detrusor contraction showed a statistically significant negative correlation with the II domain of the KHQ and the 24-h urgency episodes. There was a statistically significant positive correlation between the amplitude of first and highest detrusor contractions and the OAB severity measures. The results of the Kendall's tau-b correlation between the variables are summarised in table 2.

Table 2

	II domain Correlation coefficient (p-value)	24-h urgency Correlation coefficient (p-value)
Cystometric capacity	-0.20 (<0.001)	-0.27 (<0.001)
Compliance	-0.16 (<0.001)	-0.16 (<0.001)
Amplitude of first detrusor contraction	0.21 (0.029)	0.35 (0.016)

Amplitude of highest detrusor contraction	0.09 (0.042)	0.15 (0.033)
Threshold volume for detrusor contraction	-0.13 (0.009)	-0.20 (0.008)

There was no statistically significant difference in the II domain of the KHQ ($p=0.292$) and 24-h urgency ($p=0.131$) between women with and without leakage per urethram during a detrusor contraction. Patients with spontaneous DO had more urgency episodes ($p=0.025$) and similar score in the II domain ($p=0.095$) compared to participants with provoked DO.

Interpretation of results

This study identified a number of urodynamic variables with statistically significant correlations with validated measures of severity of OAB symptoms. The use of the recently developed urgency scales and HRQoL questionnaires in a large female population allowed the demonstration of associations missed previously in studies of small mixed populations using bladder diaries. The measures more commonly used for describing the severity of DO, leakage per urethram during a detrusor contraction and amplitude of the highest detrusor contraction, have limited role confirming the complicated interaction between the detrusor and the urethral sphincter in women.

Concluding message

Our study shows urodynamic variables associated with the severity of DO. These parameters could be used for the development of a validated urodynamic-based DO severity scale.

References

1. J Urol 2006; 175: 191-195
2. Neurourol Urodyn 2002; 21: 261-274
3. BJU Int 2011; 107: 1612-1617

Disclosures

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