109

Rademakers K[1], Valk F[2], van Koeveringe G[1], Oelke M[3]
1. *Maastricht University Medical Centre, Maastricht, the Netherlands,* ***2.*** *Maastricht University, Maastricht, the Netherlands,* ***3.*** *Hannover Medical School, Hannover, Gernany*

SYMPTOMATIC DIFFERENCES IN NON-OBSTRUCTIVE PATIENTS WITH POOR DETRUSOR FUNCTION VERSUS NORMAL DETRUSOR FUNCTION

Hypothesis / aims of study
Voiding dysfunction can be caused by either bladder outlet obstruction (BOO) or detrusor underactivity (DU) or a combination of both. In this perspective DU is a common, but poorly understood lower urinary tract dysfunction. Recently, to facilitatie further research, a working definition has been purposed, which incorporates a symptom complex suggestive for DU. The complaints taken into account are prolonged urination time, feeling of incomplete emptying, reduced sensation of filling and a slow stream [1]. Oelke et al. have been developing a urodynamic tool to classify DU, which relates bladder contractility to BOO in a nomogram. Patients below the 25th percentile in this nomogram are considered to have a poor detrusor function [2,3]. Since some possibly DU related symptoms are assessed with questions in the International Prostate Symptom Score (IPSS) questionnaire, the IPSS questions were analysed in patients with and without DU, in the absence of BOO. So far, there is no knowledge about specific symptomatic differences between specific centile groups of non-obstructed male patients in the nomogram.
Aim of the study was to identify if IPSS questions can differentiate between non-obstructive patients with poor detrusor function and ones with a normal detrusor function.

Study design, materials and methods
Treatment naïve men aged ≥40 years with uncomplicated lower urinary tract symptoms were prospectively evaluated between April 1993 and December 2007. All included patients were assessed using IPSS, prostate volume, uroflowmetry, post-void residual, and pressure-flow measurement. Patient with detrusor overactivity on pressure-flow analysis were excluded from this study. The group was divided into two subgroups, i.e. A: Non-obstructive patients (BOO Index (BOOI) ≤40) below the 25th percentile, and B: Non-obstructive patients (BOOI≤40) above the 25th percentile (*Figure 1*). Parameters of both groups were compared using a chi-square test.

Results
In total, 822 male patients were included to develop the nomogram. Urodynamics classified 413 patients being non-obstructive. The mean age was 62 (SD=1) years. The mean IPSS score was 15 (SD=1) and the average prostate volume was 35cc (SD=2). Group A (n=56) and B (n=134) consisted of 190 patients (23%). When comparing these two groups, a significant difference was found in IPSS question 5 (mean 3.5 vs. 3.0, p=0.031). In addition, significant differences were found for age (p=0.003), PVR (p=0.004) as well as in the pressure-flow data for cystometric bladder capacity (p<0.001) and Bladder Contractility Index (p=0.015) (*Table 1*).

Interpretation of results
Non-obstructive patients with a poor detrusor function did report a weak urinary flow more frequently (IPSS5). Based on these analyses IPSS 5 may be the only (or at least most prominent) discriminating parameter of the IPSS questions possibly clinically differentiating DU from other non-BOO related LUTS. To be able to find other clinically relevant symptoms differentiating DU from other male LUT causes, more extensive and comprehensive research should be designed in order to search for symptoms in a broader perspective.

Concluding message
Unobstructive patients with DU on urodynamics specifically reported a weak urinary flow more often compared to other non-obstructive patients. The IPSS questionnaire might be useful in detecting DU in non-obstructive patients. However, additional questions should be considered.

Figure 1. DU classification nomogram. Highlighting the two non-obstructive patientgroups (A & B) which are compared in this study. A: group below 25th centile, and B: group above 25th percentile

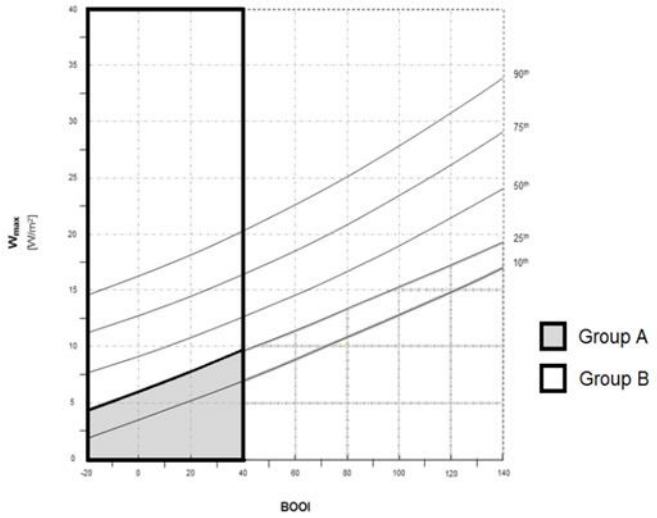

Table 1. Comparison of patients below the 25th percentile, BOOI<40 (Group A) with patients in the group above the 25th percentile, BOOI<40 (Group B). Values are presented as average with (95% CI). The p-value is calculated by using an independent samples t-test and chi-square (considered significant at a level p≤0.05)

	<25th n=56	**>25th** n=134	**p-value**
Age [years]	61 (57-65)	62 (59-65)	0.003
Prostate volume [cc]	35 (30-41)	37 (31-42)	0.862
Height [cm]	176 (173-179)	174 (172-176)	0.741
Weight [kg]	82 (78-87)	80 (77-84)	0.532
IPSS	13 (11-16)	15 (12-17)	0.391
IPSS 1	1.4 (0.6-2,2)	1.8 (1.22-2.3)	0.080
IPSS 2	1.8 (1.2-2.4)	2.1 (1.6-2.6)	0.187
IPSS 3	1,7 (0.9-2.5)	1.7 (1.2-2.3)	0.615
IPSS 4	1.3 (0.7-2.0)	1.9 (1.3-2.6)	0.620
IPSS 5	3.5 (2.6-4.3)	3.0 (2.4-3.6)	0.031
IPSS 6	1.5 (0.8-2.2)	1.6 (0.9-2.2)	0.408
IPSS 7	2.0 (1.4-2,7)	2.4 (1.9-2.9)	0.754
IPSS storage sub-score	5 (4-6)	6 (5-8)	0.188
IPSS voiding sub-score	8 (6-10)	8 (6-10)	0.800
IPSS QoL score	3.1 (2.3-3.8)	3.0 (2.4-3.6)	0.396
IPSS Mild/Mod/Sev	2.0 (1.8-2.3)	2.1 (1.8-2.3)	0.800
PVR	168 (114-222)	99 (78-120)	0.004
Multichannel urodynamics			
Cystometric bladder capacity [ml]	513 (440-586)	464 (401-529)	0.000
$P_{detQmax}$ [cm H_2O]	36.3 (32.1-40.4)	42.7 (38.4-47.0)	0.186
BOOI	23 (18-28)	23 (19-27)	0.741
Bladder Contractility Index	69 (62-76)	90 (82-98)	0.015
W_{max} [W/m^2]	5.7 (5.1-6.4)	12.7 (11.8-13.6)	0.000

BOOI (Bladder Outlet Obstruction Index); IPSS (International Prostate Symptom Score); PdetQmax (Detrusor pressure at maximum flow); PVR (Post Void Residual); QoL (Quality of Life); W_{max} (detrusor contraction power parameter).

References

1. Chapple CR, et al. The underactive Bladder: A new Clinical Concept? Eur Urol.(2015)
2. Rademakers KLJ, van Koeveringe GA, Oelke M. 543 Development of a nomogram for the classification of detrusor underactivity (DU) in adult men with lower urinary tract symptoms (LUTS) and bladder outlet obstruction (BOO) European Urology Supplements 14 (2), e543-e543a
3. Oelke M, Rademakers KLJ, van Koeveringe GA. Detrusor contraction power parameters (BCI and W max) rise with increasing bladder outlet obstruction grade in men with lower urinary tract symptoms: results from a urodynamic database analysis. World journal of urology; Oct;32(5):1177-83

Disclosures

Funding: Astellas Europe Fund 2012 **Clinical Trial:** No **Subjects:** HUMAN **Ethics not Req'd:** Its a retrospective analysis of data collected (prospectively) in symptomatic patients in their normal work-up to diagnosis and treatment. **Helsinki:** Yes **Informed Consent:** Yes