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PREVALENCE RATES OF BLADDER OUTLET OBSTRUCTION AND DETRUSOR UNDERACTIVITY AND THEIR CLINICAL AND URODYNAMIC FINDINGS IN WOMEN WITH ≥STAGE II CYSTOCELE

Hypothesis / aims of study
Prevalence rates of bladder outlet obstruction (BOO) and detrusor underactivity (DU) and their related clinical and urodynamic findings in women with ≥ pelvic organ prolapse quantification stage II cystocele are important for clinical consultation. Thus, the aim of this study was to elucidate the above findings and between-group associations.

Study design, materials and methods
Between November 2011 and January 2017, medical records of all women with ≥stage II cystocele who underwent 20 min pad testing and urodynamic studies in a medical center were reviewed. Only those with complete data of maximum flow rate (Qmax) and detrusor pressure at maximum flow rate (PdetQmax) were enrolled. ANOVA test and post-hoc testing with bonferroni's correction were used for statistical analysis. Woman were defined as having DU when Qmax was <12 mL/s and PdetQmax was <10 cmH2O [1,2], and were defined as having BOO when Qmax was <12 mL/s and PdetQmax was ≥25 cmH2O with sustained detrusor contraction during voiding cystometry [2,3].

Results
Among 455 women with ≥stage II cystocele, thirty-five (7.7%) women were found to have BOO, and 12 (2.6 %) women were found to have DU (Table 1).
Women with cystocele and coexistent BOO or DU had significantly smaller voided volume and the volume at strong desire to void and longer voiding time (Table 1). In addition, women with BOO had significantly higher urgency episodes than those without BOO/DU. Women with DU had higher nocturia episodes than those without BOO/DU (Table 1).
Urgency episodes of 72 hours = 11 was the most strongly predictive cutoff value for predicting BOO with receiver operating characteristic curve (ROC) area of 0.57 (95% CI = 0.45 to 0.70, sensitivity = 37.0%, specificity = 82.4%, Fig 1a). Nocturia episodes of 72 hours = 6 was the most strongly predictive cutoff value for predicting DU with ROC area of 0.79 (95% CI = 0.66 to 0.92, sensitivity = 83.3%, specificity = 72.7%, Fig 1b).The scores of lower urinary symptoms and scores of King's Health Questionnaires did not differ between the groups (Table 2).

Interpretation of results
Both BOO and DU had a decrease in the bladder capacity and prolonged voiding time. Urgency was associated with BOO, and nocturia was associated with DU.

Concluding message
Both BOO and DU are not infrequently in women with ≥ stage II cystocele, and are associated with small bladder capacity, prolonged voiding time, and some lower urinary tract symptoms. The above findings may provide useful information for preoperative consultation and management.

Table 1. Prevalence, clinical and urodynamic findings of bladder outlet obstruction or detrusor underactivity among women with ≥stage II cystocele (n=455)

Variables	BOO (a, n=35)	DU (b, n=12)	ND BOO/DU (c, n=408)	P†	Post hoc test‡
Age (years)	66.0±9.7	69.2±8.7	65.5±10.0	0.44	
Parity	3.5±1.3	3.3±2.0	3.2±1.2	0.38	
BMI (kg/m2)	24.4±3.5	24.5±3.5	24.3±3.4	0.98	
Cystocele stage	2.5±0.6	2.6±0.7	2.4±0.6	0.65	
Uterine prolapse stage	1.3±1.3	1.6±1.5	1.3±1.3	0.82	
Rectocele stage	1.0±0.8	1.5±1.2	1.1±1.0	0.35	
≥ stage II uterine prolapse	17 (49)	6 (50)	183 (45)	0.87	
Pad weight before reduction (g)	17.6±36.1	22.1±47.3	17.3±32.4	0.89	
Pad weight after reduction (g)	33.4±48.3	41.6±51.7	24.3±38.3	0.16	
Qmax (mL/s)	8.5±2.1	8.7±2.2	20.9±9.6	<0.001	a vs. c, p<0.001 b vs. c, p<0.001
Voided volume (mL)	144±71	156±76	280±130	<0.001	a vs. c, p<0.001 b vs. c, p=0.002
Post-void residual (mL)	56±39	59±29	48±35	0.23	
Voiding time (s)	48±33	57±25	39±18	<0.001	a vs. c, p<0.001 b vs. c, p=0.002
Strong desire (mL)	213±64	215±46	255±53	<0.001	a vs. c, p<0.001 b vs. c, p=0.03
PdetQmax (cmH2O)	35.0±8.1	3.8±3.7	22.2±16.8	<0.001	a vs. c, a vs. b, b vs. c, p<0.001

MUCP (cmH2O)	63.1±33.8	53.1±26.9	63.8±38.0	0.62	
FPL (cm)	2.3±0.7	2.1±0.6	2.5±0.7	0.03	
PTR at MUP (%)	114±46	104±43	117±51	0.67	
Daytime frequency (72 h)	26.6±9.3	27.0±12.4	26.1±9.0	0.93	
Nocturia (72 h)	4.8±3.3	7.8±4.3	4.2±3.3	0.02	b vs. c, p=0.03
Urgency (72 h)	9.2±11.5	12.3±12.2	5.2±7.8	0.007	a vs. c, p=0.046
Incontinence (72 h)	1.3±4.9	3.2±5.0	1.3±4.1	0.55	
Voided volume (72h, mL)	4399±1760	4476±2860	5262±2322	0.13	
Fluid intake (72h, mL)	4334±1589	4083±2095	4985±1989	0.15	

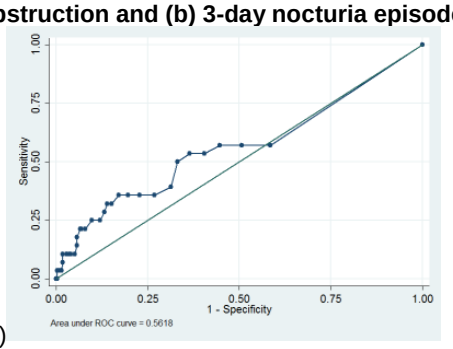
Values are presented as mean ± standard deviation or number (percentage). BMI = body mass index; BO = bladder oversensitivity; DO = detrusor overactivity; FPL = functional profile length; MUCP = maximum urethral closure pressure; PdetQmax = detrusor pressure at maximum flow rate; PTR at MUP = pressure transmission ratio at maximum urethral pressure; ND: no demonstrated; Qmax = maximum flow rate; SUI = stress urinary incontinence. †ANOVA test. ‡Post hoc test with Bonferroni's correction.

Table 2. Lower urinary symptoms and scores of King's Health Questionnaires of bladder outlet obstruction or detrusor underactivity among women with ≥ stage II cystocele (n=455)

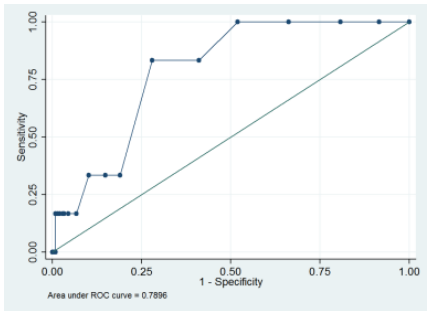
Variables	BOO (a, n=35)	DU (b, n=12)	ND BOO/DU (c, n=408)	P†	Post hoc test‡
PPBC	3.3±1.5	3.9±1.2	3.4±1.4	0.45	-
OABSS	6.2±4.0	8.0±3.9	5.6±3.5	0.06	b vs. c, p=0.09
USS	2.1±1.3	2.0±1.2	1.8±1.1	0.40	-
UDI-6	6.0±4.9	6.9±4.9	5.8±4.1	0.69	-
IIQ-7	7.5±6.0	7.5±5.8	6.3±5.7	0.40	-
General health perceptions	45±23	52±13	48±20	0.48	-
Incontinence impact	43±35	45±22	41±31	0.89	-
Role limitations	34±39	47±22	36±31	0.50	-
Physical limitations	44±34	45±20	39±32	0.59	-
Social limitations	32±36	35±31	25±29	0.25	-
Personal relationships	26±33	56±38	20±28	0.08	-
Emotions	36±33	32±21	33±29	0.85	-
Sleep / energy	35±32	38±25	33±27	0.78	-
Severity measures	30±31	31±29	26±25	0.56	-

Values are presented as mean ± standard deviation. IIQ-7 = Incontinence Impact Questionnaire; OABSS = overactive bladder symptoms score; PPRC: patient perception of bladder condition; UDI-6 = Urogenital Distress Inventory questionnaire; USS = urgency severity scales. The other abbreviations are as in Table 1. †ANOVA test. ‡Post hoc test with Bonferroni's correction.

Fig 1. The receiver operating characteristic (ROC) curves of using (a) 3-day urgency episodes to predict bladder outlet obstruction and (b) 3-day nocturia episodes to predict detrusor underactivity.



(a)



(b)

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Disclosures

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