

CAN FEMALE VOIDING DYSFUNCTION BE PREDICTED USING A VALIDATED QUESTIONNAIRE

Hypothesis / aims of study

Individual symptoms of female voiding dysfunction (VD) have low predictability. The international prostate symptom score (IPSS) is a validated questionnaire that has been modified for women (wIPSS). Other symptoms such as hesitancy, urinary force of stream, constipation had been postulated to have some influence on predictability of female VD. We aim to elucidate symptoms or clinical factors that could predict objective female VD

Study design, materials and methods

651 women who attended an urogynaecology clinic for urodynamic investigation were recruited for this study. All participants underwent a detailed general, obstetric and urogynaecologic history, urine culture, pelvic examination, prolapse assessment and completed a standardized wIPSS voiding questionnaire. Urinary flow profile were classified as normal (0), intermittent (1), sawtooth (2) or plateau (3). Additional questions added to the original IPSS include that of hesitancy, straining to evacuate bowel, incomplete bowel emptying and force of stream to void urine (measured on a scale of 0-100). VD was defined as a maximum flow rate under the 10th centile of the Liverpool nomogram and/or a post void residual (PVR) volume greater than 100mL. Other objective definitions included $Q_{max} \leq 12$ or 15ml/sec and $PVR \geq 100$ ml. All clinical variables were separated into deciles, to determine the most significant cut-off against objective VD. Fischer exact tests were used to compare the prevalences for VD achieved by the respective cut-offs. Classification and regression tree (CART) building algorithms were employed to predict VD.

Results

Table 1 detailed the prevalences of VD based on various objective definitions. The VD definitions of $Q_{Max} \leq 15$ ml/sec and $PVR \geq 100$ ml & $Q_{Max} < 10^{th}$ centile were chosen, for further analyses. Table 2 and Table 3 showed the respective cutoffs and overall association of dichotomized variables with these VD definitions.

Definition of VD	Prevalence % (n/N)
$Q_{Max} < 10^{th}$ centile	38% 245/645
$Q_{Max} \leq 12$ ml/sec	9.1% 59/645
$PVR \geq 100$ ml	8.4% 55/651
$PDetQ_{Max} \geq 40$	16.1% 91/564
$Q_{Max} \leq 12$ ml/sec & $PVR \geq 100$ ml	2.9% 19/645
$Q_{Max} \leq 15$ ml/sec & $PVR \geq 100$ ml	4.5% 29/645
$Q_{Max} \leq 12$ ml/sec & $PDetQ_{Max} \geq 40$	2.5% 16/638

Table 2: Most significant cut-offs of clinical variables & their prevalence for $Q_{Max} \leq 15$ ml/sec & $PVR \geq 100$ ml

Variable	cut-off	Prevalence \leq cut-off	prevalence $>$ cut-off	p-value
wIPSS	25	3.4% (20/587)	16.1% (9/56)	p=0.00010
Flow Profile	"0"	0.8% (3/390)	6.3% (13/205)	p=0.00028
Force of Stream	55	8.8% (20/228)	2.2% (9/413)	p=0.00037
Age	62 yrs	1.9% (7/373)	8.1% (22/272)	p=0.00048
POPq ba	0	3.5% (18/521)	10.6% (10/94)	p=0.005
Time to max flow	34 sec	1.7% (8/476)	6.8% (8/118)	p=0.006
Bowel Empt.	"1"	3.0% (12/405)	7.1% (17/239)	p=0.018
POPq c	-6.0	3.6% (13/358)	5.8% (15/257)	p=0.24
POPq bp	-2.0	3.9% (14/361)	5.5% (14/253)	p=0.33

Table 3: Most significant cut-offs of clinical variables & their prevalences for - QMax <10th centile

Variable	cut-off	Prevalence ≤ cut-off	prevalence> cut-off	p-value
FlowProfile	“0”	21.0% (82/390)	60.5% (124/205)	p<0.00001
Age	62 yrs	28.4% (106/373)	51.1% (139/272)	p<0.00001
Time to max flow	46 sec	31.2% (168/538)	67.9% (38/56)	p<0.00001
Force of stream	70	46.2% (175/379)	26.3% (69/262)	p<0.00001
Menopause	No	26.4% (62/235)	44.6% (183/410)	p=0.00001
POPq ba	0	34.5% (180/521)	58.5% (55/ 94)	p=0.00003
wIPSS	17	32.4% (145/447)	50.0% (98/196)	p=0.00005
POPq c	-3.0	36.2% (196/542)	53.4% (39/ 73)	p=0.007
Parity#	1	28.3% (26/ 92)	39.6% (219/553)	p=0.048
BMI	23.2	31.2% (39/125)	39.8% (206/518)	p=0.082
POPq bp	0	37.4% (208/556)	46.6% (27/ 58)	p=0.20
BowStrain	“0”	35.2% (92/261)	39.9% (153/383)	p=0.247
BowEmpt.	“1”	37.3% (151/405)	39.3% (94/239)	p=0.62

Interpretation of results

The most significant associations between clinical variables and the defined VD were found for wIPSS score, flow profile, force of stream, age, anterior wall prolapse to introitus, time to max flow and symptoms of incomplete bowel emptying towards VD. A wIPSS score of >25 has a 16.1% prevalence (95%CI: 7.6, 28.3). A combination of low wIPSS score (<25), a normal flow profile and a reasonable force of stream (at least 55) has a high negative predictive value (100%; 95%CI 98.3,100) against VD (QMax ≤ 15 ml/sec & PVR ≥100 ml).

Concluding message

VD had an incidence of 3-38% depending on objective definitions. Women with VD were more likely to be older and have anterior vaginal wall prolapse. Whilst positive prediction of VD remains low, despite combination of clinical factors & wIPSS, negative prediction of VD is possible using the classification and regression tree building algorithms.

Legend: Clinical Questionnaire used. wIPSS included the first 8 question.

Over the past month	Not at all Never	< 1 time in 5 or (Rarely)	< half the time (Sometimes)	About half the time	> half the time (Often)	Almost always
Incomplete Emptying Over the past month, how often have you had a sensation of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5
Frequency Over the past month, how often have you to urinate again less than 2 hours after urinating?						
Intermittency Over the past month, how often have you found you stopped and started again several times when you urinate?						
Urgency Over the past month, how often have you found it difficult to postpone urination?						
Weak Stream Over the past month, how often have you had a weak urinary stream?						
Straining Over the past month, how often have you had to push or strain to begin urination?						
Hesitancy Over the pas month, is there a delay before you can start to urinate						
Nocturia Over the past month, how many times did you most typically get up to urinate from the time you went to bed at night until you got up in the morning?	None	once	twice	3 times	4 times	5 times
Quality of Life due to Urinary Symptoms If you had to spend the rest of your life with your condition as it now, how would you feel about it?	Delighted	Pleased	Mostly satisfied	Mixed (about equally satisfied and dissatisfied)	Mostly dissatisfied	Unhappy
Bowel Function constipation						
Do you feel you need to strain too hard to have a bowel movement?	Not at all	Somewhat	Moderately	Quite a bit		
Do you feel you have not completely emptied your bowels at the end of a bowel movement?	Not at all	Somewhat	Moderately	Quite a bit		

Force of Stream FOS: Please rate the Force of Stream – 100 being very good force; 0 being no force at all.



References

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