

WHAT IS THE ADDITIONAL BURDEN FOR PATIENTS WITH DETRUSOR UNDERACTIVITY WHEN THEY ALSO HAVE DETRUSOR OVERACTIVITY?

Hypothesis / aims of study

Analysis of a large patient database has shown that signs and symptoms can be used to distinguish men and women patients with detrusor underactivity (DU) from patients with normal pressure flow studies (PFS), and further distinguish between DU and bladder outlet obstruction (BOO) [1]. That analysis, however, excluded patients with detrusor overactivity (DO), yet in a normal clinic, patients can present with both DU and DO. This combination has been termed detrusor hyperactivity with impaired contractility (DHIC) [2]. We have run additional analyses to determine what difference the inclusion of DO makes to the signs and symptoms, and to determine the prevalence of both conditions in the database analysed.

Study design, materials and methods

Symptomatic, urodynamic and other data, from a computer database of 28,282 urodynamic tests, were analysed retrospectively. In this analysis symptoms and signs which showed a statistically significant difference between DU without DO and DU with DO were identified. Patients with neurological features were excluded, except for those who only reported diabetes or epilepsy. Logistic regression models including patient group and age as factors were used for each binary variable. Rank ANCOVA models using patient group as factor and age as covariate were used for each numerical variable.

For males, DU was defined as bladder contractility index (BCI) < 100, bladder voiding efficiency (BVE) < 90%, and bladder outlet obstruction index (BOOI) < 20. For females, DU was defined as $p_{\text{abd}}Q_{\text{max}} < 20$, $Q_{\text{max}} < 15$, and BVE < 90%, excluding those with clinically observed obstruction.

Results

Of the 4,619 male tests analysed from the database, 129 (2.8%) males had DU without DO, and 123 (2.7%) males had DU with DO. Data from males showing a statistically significant difference between the groups are listed in Table 1.

Of the 15,045 female tests analysed from the database, 308 (2.0%) females had DU without DO, and 145 (1.0%) females had both DU and DO. Data from females showing a statistically significant difference between the groups are listed in Table 2.

Interpretation of results

In general, male and female patients having DU with DO will generally be older, have smaller voided and residual volumes, and have smaller volumes when reporting sensation compared to patients having DU without DO. Male patients having DU with DO will be more likely to have frequency, and female patients having DU with DO to use more pads both day and night, compared to patients having DU without DO. Additionally, female patients having DU with DO are more likely to report constipation, have abnormal anal tone and have shorter voiding time than those having DU without DO.

Concluding message

There are clear differences in signs and symptoms between patients having DU without DO, and patients having DU with DO. If these differences in symptomatology are clearly the most bothersome complaints, treatment of those complaints can be considered first before other treatment is commenced.

Variable Label (Male)	Statistic	DU without DO	DU with DO
Age (years) at visit	n	129	123
	median (Q1 - Q3)	63.0 (49.0 - 72.0)	71.0 *** (62.0 - 76.0)
Number day micturitions on bladder diary	n	86	94
	median (Q1 - Q3)	6.0 (5.0 - 8.0)	8.0 ** (6.0 - 10.0)
Volume first desire during PFS (mL)	n	114	107
	median (Q1 - Q3)	347 (200 - 502)	150 *** (83 - 281)
$p_{\text{abd}}Q_{\text{max}}$ during PFS (cmH20)	n	127	122
	median (Q1 - Q3)	55 (40 - 75)	48 * (37 - 63)
Volume voided during PFS (mL)	n	129	123
	median (Q1 - Q3)	233 (130 - 360)	153 *** (98 - 206)
Residual urine during PFS (mL)	n	129	123
	median (Q1 - Q3)	200 (98 - 450)	100 *** (50 - 220)
Premicturition urgency, fear of leakage (pat rptd)	n (%)	31 (30.1%)	66 (63.5%)
	Odds ratio	-	0.26 *** (0.15, 0.48)
Urge incontinence (patient reported)	n (%)	23 (33.8%)	45 (56.2%)
	Odds ratio (95% CI)	-	0.4 ** (0.20, 0.79)
History of retention	n (%)	39 (39.4%)	27 (25.7%)
	Odds ratio (95% CI)	-	2.06 * (1.12, 3.78)
Reduced filling phase sensation	n (%)	34 (28.3%)	10 (8.6%)
	Odds ratio (95% CI)	-	3.69 ** (1.70, 7.99)

Table 1. Summary of data for males comparing patients having DU without DO, with patients having DU with DO. Stars indicate a statistically significant difference from the DU without DO group at: * p<0.05; ** p<0.01; *** p<0.0001.

n (%) refers to the number of patients with non-missing data who report the symptom.

Variable Label (Female)	Statistic	DU without DO	DU with DO
Age (years) at visit	n	308	145
	median (Q1 - Q3)	59.0 (49.0 - 71.0)	64.0 ** (53.0 - 74.0)
Weight (kg)	n	160	62
	median (Q1 - Q3)	67.5 (59.0 - 76.5)	70.0 * (61.0 - 84.0)
Pads day time	n	150	75
	median (Q1 - Q3)	3 (2 - 4)	3 * (2 - 5)
Pads night time	n	118	62
	median (Q1 - Q3)	1 (0 - 1)	1 ** (0 - 2)
Volume first desire during PFS (mL)	n	282	129
	median (Q1 - Q3)	229 (155 - 330)	156 *** (96 - 253)
Volume urgent desire during PFS (mL)	n	57	110
	median (Q1 - Q3)	257 (183 - 340)	165 *** (99 - 253)
p _{abd} Q _{max} during PFS (cmH20)	n	307	142
	median (Q1 - Q3)	36 (25 - 51)	34 * (25 - 42)
Volume voided during PFS (mL)	n	308	145
	median (Q1 - Q3)	202 (126 - 291)	152 *** (80 - 235)
Voiding time (sec)	n	37	14
	median (Q1 - Q3)	82.0 (42.7 - 126.0)	41.4 * (27.5 - 69.4)
Residual urine during PFS (mL)	n	308	145
	median (Q1 - Q3)	148 (65 - 234)	85 ** (43 - 190)
Urge incontinence (patient reported)	n (%)	147 (57.0%)	85 (72.0%)
	Odds ratio (95% CI)	-	0.55 * (0.34, 0.89)
Bowel function diagnosis - constipation	n (%)	28 (12.0%)	25 (23.6%)
	Odds ratio (95% CI)	-	0.45 ** (0.24, 0.81)
Drug use - oestrogens	n (%)	53 (19.5%)	13 (10.9%)
	Odds ratio (95% CI)	-	2.19 * (1.14, 4.22)
Anal tone abnormal	n (%)	18 (7.6%)	18 (16.7%)
	Odds ratio (95% CI)	-	0.45 * (0.22, 0.91)

Table 2. Summary of data for females comparing patients having DU without DO, with patients having DU with DO. Stars indicate as for Table 1: * p<0.05; ** p<0.01; *** p<0.0001. n (%) refers to the number of patients with non-missing data who report the symptom.

References

- Gammie A, Kaper M, Dorrepaal C, Kos T, Abrams P. Signs and Symptoms of Detrusor Underactivity: An Analysis of Clinical Presentation and Urodynamic Tests From a Large Group of Patients Undergoing Pressure Flow Studies. Eur Urol. 2016; 69:361-9.
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