

THE BEST TEST FOR DISCRIMINATING FOR INTRINSIC SPHINCTER DEFICIENCY?

Hypothesis / aims of study

Many different tests have been designed to assess urethral function. There are limited data to compare the relationship of these different tests to each other. Pressure flow studies (PFS) assess the pressure-volume relationship of the bladder during voiding, thereby evaluating detrusor function and urethral function during this phase of micturition. Urethral pressure profilometry (UPP) assesses urethral closure function of the striated sphincter in the mid urethra by measuring the intraluminal pressure along the urethra. UPP has been shown to have a large overlap between different urodynamic diagnoses; therefore it appears ineffective in diagnosing urodynamic stress incontinence (1).

The aim of this study was to evaluate the relationship between the parameters of UPP and PFS in women with lower urinary tract symptoms (LUTS).

Study design, materials and methods

Consecutive women presented to a tertiary unit with LUTS who had undergone urodynamic study and UPP for routine assessment of their urinary symptoms were recruited.

Dual channel cystometry was performed with 4 F fluid filled lines in the bladder and rectum. The bladder was filled through a 10 F filling catheter at 100 ml/min with normal saline or X-ray contrast medium (Isopaque Cysto 100mg/ml) to maximum capacity tolerated or 600 ml. Provocative manoeuvres were undertaken to demonstrate stress incontinence or detrusor overactivity. Finally the women were asked to void in the sitting position and a pressure flow study was recorded. From this Detrusor pressure at maximum flow rate ($P_{detQ_{max}}$), maximum flow rate (Q_{max}), opening detrusor pressure (ODP) and closure detrusor pressure (CDP) were obtained from recording. Urethral pressure profilometry (UPP) was performed using 4F microtip pressure transducer with the technique described by Hilton and Stanton (2). The maximum urethral closure pressure (MUCP), maximum urethral pressure (MUP) and functional urethral length (FUL) were all calculated. Statistical analysis was carried out using the SPSS program version 14.0 (SPSS Inc., Chicago, Illinois, USA).

Results

151 women were recruited. Of those 128 sets of data were analysed. Women were excluded when good quality PFSs or UPP traces were not obtained.

The most significant correlation was found between ODP and MUCP/ MUP (Table and Figure 1). We also found that the values of ODP showed less overlap between diagnostic groups than the values of MUCP, which showed large overlap. The figure 2 illustrates qualitatively that the parameter ODP is lower in patients with USI in comparison to patients with DOA and UMI. The Kruskal-Wallis chi-square test is significant at 5% level: chi-square=7.99; p=0.018.

Table 1: Correlation of pressure flow studies and urethral pressure profile parameters.

Correlation of Parameters		ODP	pdet.Qmax	Qmax	CDP
MUP	Pearson Correlation	*0.532	*0.441	*-0.269	*0.421
	Sig. (2-tailed)	0.000	0.000	0.002	0.000
	N	128	126	126	123
MUCP	Pearson Correlation	*0.538	*0.465	*-0.247	80.401
	Sig. (2-tailed)	0.000	0.000	0.005	0.000
	N	128	126	126	123
FUL	Pearson Correlation	*0.263	*0.238	0.085	0.230
	Sig. (2-tailed)	0.003	0.007	0.342	0.011
	N	128	126	126	123

*Correlation is significant at the 0.01 level (2-tailed).

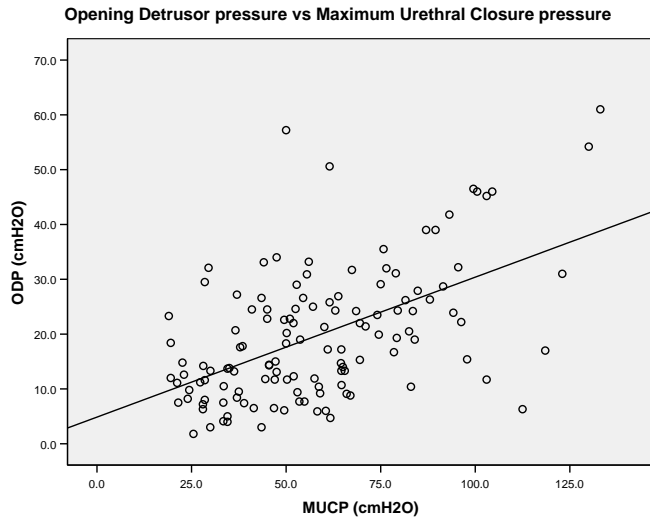
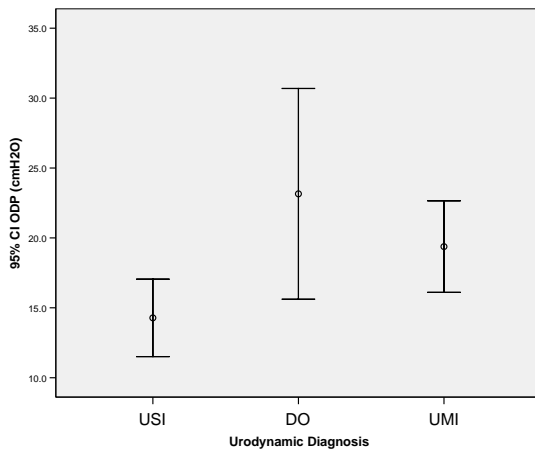


Figure 1: Scatter plot of ODP vs MUCP ($r= 0.532$, $p<0.0001$).

95% Confidence Intervals of Opening Detrusor Pressure in different Diagnosis



95% Confidence Intervals of Maximum Urethral Closure Pressure in different Urodynamic Diagnosis

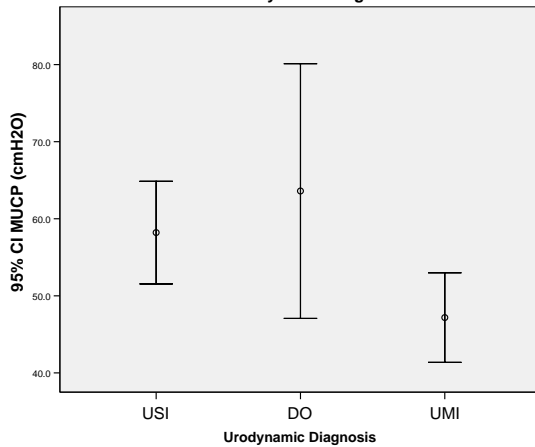


Figure 2: Error-bar chart of the three main urodynamic diagnosis and their 95% confidence intervals for ODP.

Figure 3: Error-bar chart of the three main urodynamic diagnosis and their 95% confidence intervals for MUCP.

Interpretation of results

The most significant correlation was found between ODP and MUCP/ MUP (Table and Figure 1). The figure 2 illustrates qualitatively that the parameter ODP is lower in patients with USI in comparison to patients with DOA and UMI (The Kruskal-Wallis chi-square test is significant at 5% level). The Figure 3 illustrates that the parameter MUCP is not different in patients with DO and USI as there is a significant overlap in the values measured (The Kruskal-Wallis chi-square test is not significant).

Concluding message

The result of our study supports current evidence that PFS give a good indication of urethral function and may be a better test for intrinsic sphincter deficiency. Furthermore, our study shows that it may be more useful than MUCP as a diagnostic tool for USI as there is less overlap of this diagnostic group. Although the trend for values of UPP and PFS were similar and a significant correlation was shown, these tests are performed under different conditions, and urethral function may differ from values at rest compared with voiding due to activation of additional mechanisms such as longitudinal smooth muscle. Therefore, further studies may be needed to confirm our results.

References

1. Obstetrical and Gynaecological Survey (2001) 56; 720-35
2. Br J Obstet Gynaecol. 1983 Oct; 90(10): 919-33

<i>Specify source of funding or grant</i>	None
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Research and Development Department, St.Mary's Hospital, Praed Street, London
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	No