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IS URETHRAL RESISTANCE A USEFUL MEASUREMENT?

Hypothesis / aims of study

Currently there is no test of urethral function which is diagnostic of urodynamic stress incontinence and videocystourethrography remains the investigation of choice. Urethral Pressure Profilometry (UPP), urethral sphincter volume **(1)** and valsalva leak point pressures **(2)** are recognised tests of urethral function although they are not diagnostic. More recently measurement of urethral retro-resistance pressure (URP) has been proposed as a new test of urethral function and may have a role in the diagnosis of urodynamic stress incontinence**(3)**. The aim of this study was to examine the relationship between urethral sphincter function and urodynamic diagnosis to determine if analysis of urethral pressure may be used as a diagnostic tool.

Study design, materials and methods

Women were recruited prospectively from a tertiary referral urodynamic clinic. All complained of troublesome lower urinary tract symptoms and all underwent videocystourethrography including uroflowmetry, cystometry and pressure/flow voiding studies using a Laborie Aquarius urodynamic system. Analysis of the urodynamic trace was performed and opening and closing detrusor pressure marked. These were defined as the detrusor pressure when flow begins and finishes respectively. In addition acceleration and deceleration of flow was calculated for the pressure flow study. All procedures were performed in accordance with ICS Guidelines for Good Urodynamic Practice. Statistical analysis was performed using SPSS (Version 10). Means were compared using the independent samples t test whilst correlation was performed using the Pearson method.

Results

In total 100 women were recruited to the study over a three month period. The urodynamic diagnoses are shown below **[Table 1]**

Urodynamic Diagnosis	NUMBER
Normal **[Norm]**	30
Urodynamic Stress incontinence **[USI]**	22
Detrusor Overactivity and Urethral Sphincter Incompetence [**Mixed]**	9
Detrusor Overactivity **[DO]**	29
Voiding Difficulties **[VD]**	9
Sensory Urgency **[SU]**	1

TABLE1: URODYNAMIC DIAGNOSIS

Mean opening and closing detrusor pressures with 95% confidence intervals are shown below grouped by urodynamic diagnosis: **[Figure 1]**

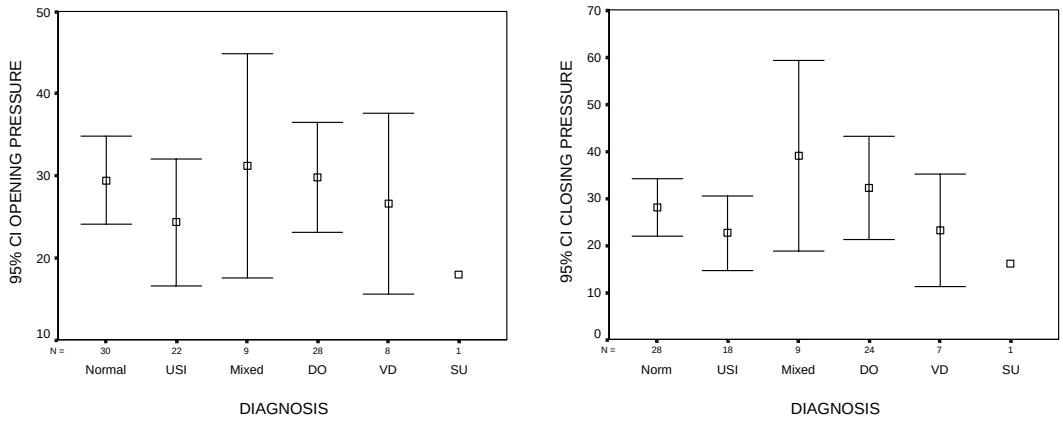

FIGURE 1: OPENING (LEFT) AND CLOSING (RIGHT) PRESSURES BY DIAGNOSIS

There was wide overlap between diagnostic groups and neither mean opening, or mean closing detrusor pressure was found to be statistically significant between diagnostic groups. **[Table 2]**. In addition there was no statistically significant difference in mean acceleration and deceleration of flow between the groups studied and no significant correlation between acceleration of flow and opening pressure (p=0.269) and deceleration of flow and closing pressure (p=0.342).

Diagnosis	Mean Open [mmHg]	Mean Close [mmHg]	Mean Accel [mls/s^2]	Mean Decel [mls/s^2]
Normal	29.43	28.10	2.56	1.22
USI	24.31	22.61	3.39	2.07
Mixed	31.22	39.11	2.69	1.91
DO	29.75	32.25	3.08	1.44
VD	26.63	23.14	2.97	2.07

Table 2: Mean detrusor pressures and acceleration/deceleration of flow

Interpretation of results

Whilst this study has not directly measured urethral resistance it does provide evidence that assessment of urethral function by measuring urethral opening and closing pressures is neither diagnostic nor discrimatory. Furthermore there would appear to be no correlation between opening and closing detrusor pressures with acceleration/deceleration of flow rates.

Concluding message

These findings would suggest that measurement of urethral resistance alone may not be adequate to make a firm diagnosis of lower urinary tract symptoms.

References

1. Neurourol Urodyn 1996; 15: 339-340
2. Curr Urol Rep 2001; 2(5): 388-391
3. Neurourol Urodyn 2004; 23(2): 109-114