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# RELIABILITY TESTING OF URETHRAL FUNCTION IN WOMEN WITH MIXED URINARY INCONTINENCE.

## Hypothesis / aims of study

Mixed urinary incontinence is a combination of pathologies including detrusor overactivity and urodynamic stress incontinence. This is diagnosed in up to 30% of women attending hospital settings. These women have poorer responses to treatment and it is particularly important to determine tests which will reliably measure urethral and detrusor dysfunction to allow the assessment and development of better treatments.
This study attempts to determine the reliability of urethral function tests in women with mixed urinary incontinence.

## Study design, materials and methods

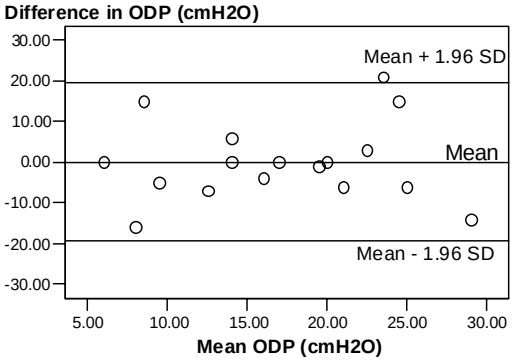
Women were recruited from an urodynamic clinic. All women were diagnosed as having urodynamic stress incontinence and detrusor overactivity on cystometry. Dual channel cystometry was performed with 4 F fluid filled lines in the bladder and rectum. The bladder was filled through a 12 F filling catheter at 100 ml/min. The first sensation to void and maximum bladder capacity were noted. The women were asked to cough every minute during the filling period. Provocative manoeuvres were undertaken to demonstrate stress incontinence at maximum capacity. In the standing position women were asked to cough in a graded fashion, the lowest vesical pressure was regarded as the cough leak point pressure (LPP). Other provocative tests such as running water and hand washing were also performed. Finally the women were asked to void in the sitting position and a pressure flow study was recorded. From this the opening detrusor pressure (ODP) and the closure detrusor pressure (CDP) were obtained.
Urethral pressure profilometry (UPP) was performed using the technique described by Hilton and Stanton (1). The maximum urethral closure pressure (MUCP), maximum urethral pressure (MUP), functional urethral length (FUL) and the pressure transmission ratio (PTR) in quartiles were all calculated. A 24-hour pad test was also carried out. Two weeks later all the tests were repeated. The precision and bias of the tests was measured using the method of Altman and Bland (2). The Coefficient of Repeatability value allows direct comparison of repeatability of each test, with a lower value indicating less variation.

## Results

17 women who were diagnosed with mixed incontinence in at least one of the tests were recruited. 11 women had mixed incontinence in both tests. The pad test was not completed by 18% of the women. 35% of subjects were not able to produce cough LPP on both visit. Otherwise all the women completed the rest of the tests.

**Table 1. Subjects with urodynamic mixed incontinence**

| Tests | Mean (SD) | Mean Difference (SD) | CR |
|---|---|---|---|
| ODP ($cmH_2O$) (n=17) | 17.09 (8.26) | 0.06 (9.85) | 19.3 |
| CDP ($cmH_2O$) (n=13) | 21.40 (14.27) | -4.92 (21.86) | 42.8 |
| Cough LPP ($cmH_2O$) (n=11) | 138.36 (55.18) | -6.36 (38.78) | 77.6 |
| MUCP ($cmH_2O$) (n=17) | 48.29 (24.51) | -10.71 (23.26) | 45.6 |
| MUP ($cmH_2O$) (n=17) | 68.44 (23.17) | -9.71 (20.03) | 39.3 |
| FUL ($cmH_2O$) (n=17) | 2.874 (0.60) | 0.006 (0.64) | 1.3 |
| PTR Q1(%) (n=17) | 101.68 (35.42) | 20.41 (49.46) | 96.9 |
| PTR Q2 (%) (n=17) | 96.88 (23.82) | -12.24 (37.78) | 74 |
| PTR Q3 (%) (n=17) | 89.79 (19.08) | 0.18 (27.40) | 53.7 |
| PTR Q4 (%) (n=17) | 78.03 (25.95) | -0.18 (28.71) | 56.3 |
| Pad test (g) (n=14) | 130.03 (329.67) | -18.89 (30.86) | 60.5 |



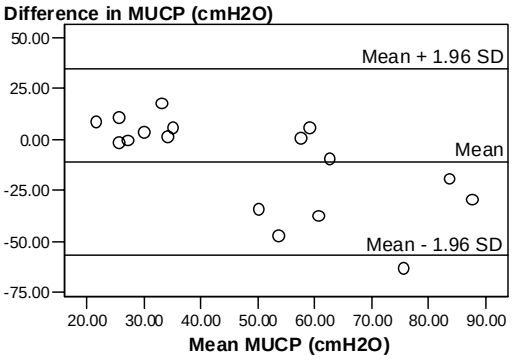
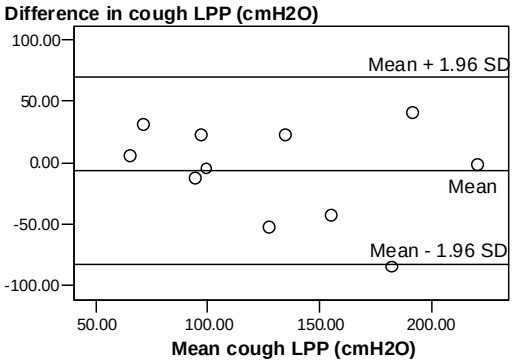




Fig 1: The difference between ODP measurements against the mean value
Fig 2: The difference between MUCP measurements against the mean value



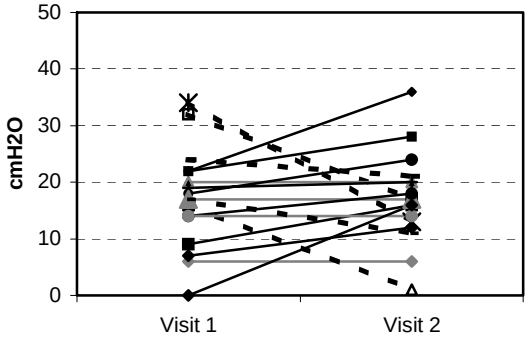




Fig 3: The difference between cough LPP measurements against the mean value.
Fig 4: ODP measurements at different visits

**Interpretation of results**

Measurements of urethral function show poor repeatability. The best of these tests appear to be FUL, ODP and MUP.

**Concluding message**

All tests of urethral function show great test retest variation in women with mixed incontinence. This is may be because urethral function is affected in the presence of detrusor overactivity.

**References**

1. Br J Obstet Gynaecol. 1983 Oct; 90(10): 919-33.
2. The Lancet. 1986: i; 307-310.

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