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Rahmanou P[1], Chaliha C[1], Scholfield D[2], Skillern L[2], Khullar V[1]
1. Department of Urogynaecology, St Mary's Hospital, Imperial College, London, 2. Pfizer Limited

RELIABILITY OF URETHRAL FUNCTION TESTS IN WOMEN WITH URODYNAMIC STRESS INCONTINENCE

Hypothesis / aims of study

There are a variety of tests to assess urethral function. These include urethral pressure profilometry, leak point pressure and pressure flow studies. The severity of urinary incontinence in urodynamic stress incontinence (USI) has been assessed with quality of life questionnaires and pad test. However, the repeatability of all these tests in USI has not been tested on a single group of women thus not allowing these tests to be compared. This study is intended to determine reproducibility of urethral function tests in women with urodynamic stress incontinence.

Study design, materials and methods

Women were recruited from an urodynamic clinic. All women were diagnosed as having urodynamic stress incontinence. 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 (CR) value allows direct comparison of repeatability of each test, with a lower value indicating less variation.

Results

19 women were recruited into the study but only 14 women had urodynamic stress incontinence in both sets of UDS.
In 20% of the women a closure detrusor pressure was not measured in both tests.

Table 1. Subjects with urodynamic stress incontinence

Tests	Mean (SD)	Mean Difference (SD)	CR
ODP (cmH_2O) (n=13)	17.5 (8.06)	-0.15 (7.06)	13.8
CDP (cmH_2O) (n=11)	18.2 (10.82)	2.00 (10.83)	21.2
Cough LPP (cmH_2O) (n=13)	141.0 (42.27)	-3.00 (22.83)	44.8
MUCP (cmH_2O) (n=14)	61.4 (30.15)	-1.71 (17.64)	34.6
MUP (cmH_2O) (n=14)	80.2 (28.26)	-5.79 (17.65)	35.3
FUL (cmH_2O) (n=14)	2.9 (0.58)	-0.03 (0.44)	0.86
PTR Q1 (%)(n=14)	123.6 (61.68)	2.36 (37.16)	72.8
PTR Q2 (%)(n=14)	108.3 (55.63)	2.07 (73.89)	145
PTR Q3 (%)(n=14)	86.2 (29.72)	-5.07 (34.04)	66.7
PTR Q4 (%)(n=14)	82.7 (53.96)	-33.79 (54.10)	106
Pad test (g) (n=13)	17.6 (19.17)	1.76 (11.55)	22.6

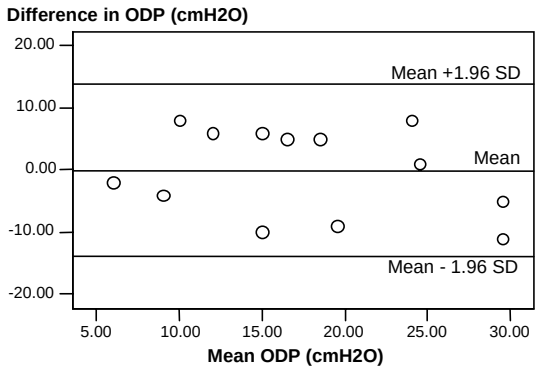

Fig 1: The difference between ODP measurements against the mean value.

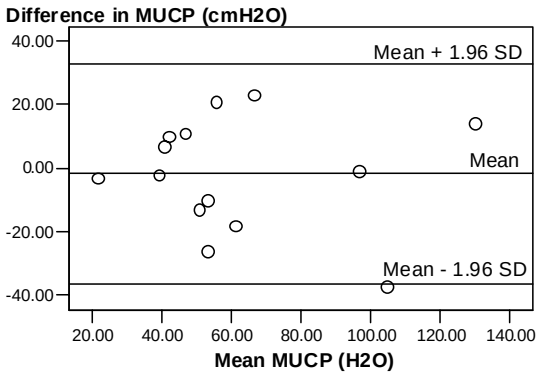

Fig 2: The difference between MUCP measurements against the mean value.

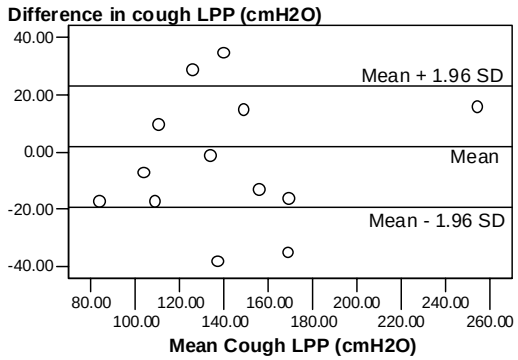

Fig 3: The difference between cough LPP measurements against the mean value.

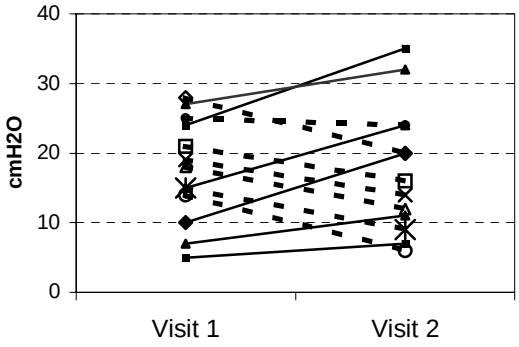

Fig 4: ODP measurements at different visits.

Interpretation of results

There was little change between the 2 sets of tests except the difference of the mean altered by 10% or more with the most distal quartile of the pressure transmission ratios (PTR Q4) and the 24 hour pad test. The 95% confidence interval for the mean difference showed greatest variation in the PTR values. However, surprisingly all the measurements apart from cough LPP and FUL showed wide confidence intervals for the mean difference which would interfere with the reliability of the measurements.

Concluding message

Most measures of urethral dysfunction in women with urodynamic stress incontinence have a poor-moderate test retest reliability. The best of these tests appear to be FUL, ODP, CDP, Pad tests and MUCP respectively.

References

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

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