

RELIABILITY AND VALIDITY OF FLUOROSCOPIC COUGH STRESS TESTING

Hypothesis / aims of study

Assessments of stress incontinence severity based on maximum urethral closure pressure or leak point pressure, can be reliably measured [1], but do not consistently predict therapeutic outcome [2]. A simpler method of classifying stress incontinence severity, based on the number of coughs required to cause leakage, has been previously described [3], but not validated. This two part study aimed firstly to measure inter- and intra-rater agreement in the interpretation of severity of stress urinary incontinence during fluoroscopic cough stress testing [3], and secondly to assess the validity of the fluoroscopic cough stress test as a predictor of outcome of conservative management of stress incontinence.

Study design, materials and methods

In the fluoroscopic cough stress test the patient is filled to maximum cystometric capacity, with Omnipaque 140mg I/ml, using a urethral catheter. In a standing position, with a semi-oblique plane the bladder neck is screened with a 1 megapixel fluoroscope at 30 frames per second. The patient is asked to cough once, thrice, and then five times in succession with maximal effort. Leakage with >3 coughs is defined as mild urodynamic stress incontinence (USI), leakage with 2 or 3 coughs is defined as moderate USI, and leakage with one cough as severe USI.

For the reliability assessment thirty-two videourodynamic clips were selected from women presenting with stress, urge or mixed urinary incontinence. On two separate occasions six urogynaecology health-care professionals, blinded to demographics and clinical details, independently assessed the clips, and classified the severity of stress urinary incontinence as none, mild, moderate or severe. Fleiss' multirater kappa coefficients and Cohen's kappa coefficients were calculated to assess strength of inter- and intra-rater agreement, respectively.

For the validity assessment casenotes of consecutive women with uncomplicated urodynamic stress incontinence (USI) attending women's health physiotherapy for supervised pelvic floor muscle training (PFMT) at our institution during 2007 were reviewed. Grade of stress incontinence severity was compared with age, Oxford Grade at presentation and discharge from physiotherapy, and referral for stress incontinence surgery, using Pearson's correlation, the t-test and the Chi-Square test.

Results

Absolute inter-rater agreement, for all six observers, for severity of stress incontinence was observed in 24 of 32 (75%) and 26 of 32 (81%) cases for the first and second occasions, respectively. Corresponding Fleiss' multirater kappa coefficients of 0.85 (95% CI 0.79-0.91) and 0.90 (95% CI 0.85-0.96) implied almost perfect agreement. Intra-rater agreement for severity was almost perfect for all raters, with individual Cohen's kappa coefficients ranging from 0.82-1.0 (SE 0-0.08).

Of 75 women with uncomplicated USI who were seen for PFMT during 2007, 13 (17.3%) were subsequently referred for stress incontinence surgery by September 2008. At presentation 23 (30.6%) were diagnosed with mild USI, 37 (49.3%) with moderate USI, and 15 (20.0%) with severe USI. There was no association between either stress incontinence severity and age ($r=0.10$, $p=0.64$), or stress incontinence severity and Oxford Grade at presentation ($r=0.201$ $p=0.16$). There was no significant difference in age between women who were, and who were not referred for surgery (48.8 years old vs. 50.2 years old, $p=0.69$). Neither the Oxford Grade at presentation, nor at discharge from PFMT predicted progression to surgery. Stress incontinence severity at presentation was however a strong predictor, with 46.6% of patients with severe USI progressing to surgery (OR 4.66 $p=0.002$).

Interpretation of results

The reliability analysis demonstrates an almost perfect level of agreement for severity of incontinence both between observers and within the same observer over time. However this defines only the reliability of interpretation, rather than test-retest reliability of measurement. The severity of incontinence assessed in this manner predicts the outcome of PFMT. These data should be useful when counselling patients about the benefits of PFMT. Future work should also assess its value as a prognosticator for surgical procedures for stress incontinence.

Concluding message

The severity of stress urinary incontinence, assessed using fluoroscopic cough stress testing, can be reliably interpreted. In women with uncomplicated USI, independent of age or pelvic floor strength, severe stress incontinence, assessed using fluoroscopic cough testing, strongly predicts failure of PFMT.

References

1. Int Urogynecol J Pelvic Floor Dysfunct 2008;19(7):933-8
2. J Urol 2008;179(4):1470-4
3. Br J Obstet Gynaecol 1986;93(4):364-366

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