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Liversidge K[1], Guzman Rojas R[1], Kamisan Atan I[1], Shek K L[1], Dietz H P[1]
***1.*** *University of Sydney*

# NEGATIVE URODYNAMIC TESTING IN WOMEN WITH STRESS INCONTINENCE

Hypothesis / aims of study

Stress urinary incontinence is a common complaint in women and frequently investigated by multichannel urodynamic (UD) testing prior to surgical treatment. In some women, UD yields a negative result for the diagnosis of urodynamic stress incontinence (USI) despite substantial symptoms. This may be due to a true negative or a false negative result. A false negative UD result for USI may inappropriately restrict management options if a diagnosis of USI is required prior to anti- incontinence surgery(1). We hypothesised that unexpectedly negative USI would be most common in young women with good pelvic floor and urethral function.

Study design, materials and methods

This is a retrospective study using archived data sets belonging to patients seen for symptoms of lower urinary tract and pelvic floor dysfunction between 26 October 2010 and 19 January 2012. Patients had undergone a local standardised interview, UD testing, urethral profilometry, an ICS POP-Q examination, levator assessment (modified Oxford grading), and 4D translabial ultrasound (US), supine and after voiding(2). Pelvic floor function was determined using postprocessing analysis of stored US volume data sets. The following measures were taken at rest and at maximal PFMC: bladder neck displacement, hiatal anteroposterior diameter, levator plate angle, and hiatal area(2). The analysis was blinded against all clinical data. These clinical and US measures were used for their value as predictors for the unexpected absence of USI. This analysis was undertaken with univariate testing and multivariate modelling.

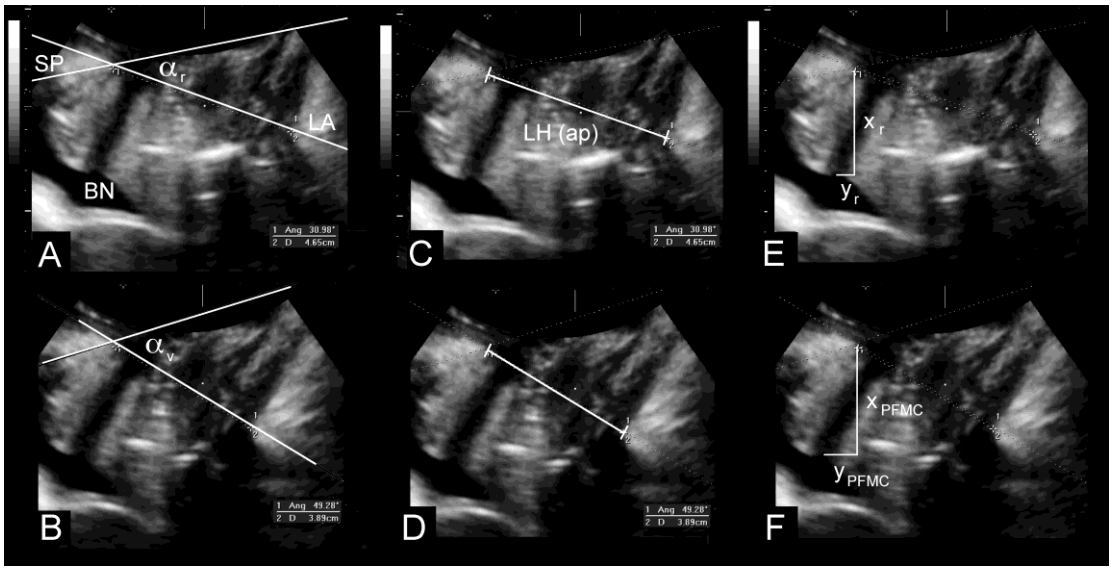


Figure 1: Fig. 5: Three methods of determining the effect of a pelvic floor muscle contraction (PFMC) in the midsagittal plane. The top images in each pair (A,C,E) represent the resting state, the bottom images (B,D,F) show findings on PFMC. A and B illustrate levator plate angle, C and D show anteroposterior diameter of the levator hiatus, and E and F illustrate bladder neck position.

Results

Of the 521 patients seen during the inclusion period, we excluded 113 due to prior incontinence or prolapse surgery. In a further 10 cases volume data were technically insufficient, leaving 398 datasets for analysis. The mean age was 55 (range, 19- 86), 60% (n=215) were postmenopausal and 5% (n=19) were on HRT. Mean BMI was 29 (range, 17- 59). Symptoms were reported as follows: stress incontinence 75% (n=299), urge incontinence 72% (n=287), frequency 29% (n=113), nocturia 44% (n=173), and symptoms of voiding dysfunction 28% (n= 110). Ninety percent (n= 358) were vaginally parous, 22% (n=89) had previously undergone a hysterectomy, and 77% (n=307) had significant (ICS stage 2+) clinical prolapse: a cystocele in 66% (n=263), uterine prolapse in 9% (n=36), an enterocele in 3% (n=11) and a rectocele in 51% (n=203). Mean levator strength (modified Oxford grading) was 2.3 (range, 0-5; SD 1.01). An avulsion defect was present in 18% (n=70); bilaterally in 7% (n=27).

Urodynamic testing was impossible in 4 patients, leaving 394. We found USI in 73% (n= 288), DO in 26% (n=103) and voiding dysfunction in 31% (n= 124). The average MUP was 46.7 cmH2O (range, 0-125, SD 20.9). On US postprocessing analysis mean bladder neck displacement on PFMC was 6.4mm (range, 0-24.4, SD 4.7), mean reduction in anteroposterior hiatal diameter was 7.8mm (range, 0- 27.2), mean levator plate angle change was 8.8 degrees (range, 0.1- 39, SD 7.4), and mean change in hiatal area on PFMC was 3.2 cm2 (range, 0-12.1, SD 2.4).

We identified unexpectedly negative USI in 57 women (14%). We then tested potential predictors such as age, BMI, prolapse as well as measures of urethral and pelvic floor function. Women with unexpectedly negative USI were younger, had less anterior compartment prolapse, and had a higher MUP. Rather surprisingly, measures of pelvic floor function, whether clinical or sonographic, were not predictive.

| Predictor | Potential false -ve (yes/ no) | P |
|---|---|---|
| **Age (yrs)** | 50.1 (SD13.5) vs 55.9 (SD 13.3) | 0.003* |
| **Body Mass Index** | 28.2 (SD 5.99) vs 29.33 (SD6.64) | ns |
| **Cystocele grade (0-3)** | 12/45 vs 17/88 vs 25/176 vs 3/85 | 0.005* |
| **Oxford grading (0-5)** | 2.25 (SD 0.83) vs 2.28 (SD 1.04) | ns |
| **SI bother (n=146, 0-10)** | 4.86 (2.4) vs 4.02 (SD 3.44) | ns |
| **Voiding Dysfunction** | 43/285 vs 14/109 | ns |
| **Detrusor Overactivity** | 40/291 vs 17/103 | ns |
| **MUP (cm H2O)** | 58.3 (SD 24.2) vs 44.9 (SD 19.6) | 0.001+ |
| **Bladder neck displacement (mm)** | 6.22 (SD 4.42) vs 6.42 (SD 4.75) | ns |
| **AP reduction (mm)** | 7.89 (SD 4.6) vs. 7.81 (SD5.2) | ns |
| **LP angle change (degrees)** | 7.71 (SD 5) vs 8.97 (SD 7.7) | ns |
| **Hiatal reduction (cm2)** | 3.04 (SD 2.12) vs 3.26 (SD 2.37) | ns |

Table 1: Predictors of potentially false negative urodynamic findings in women with stress urinary incontinence. * negative association, + positive association. On multivariate testing only cystocele grade and MUCP remained significant predictors.

Interpretation of results

Unexpectedly negative urodynamic testing for USI, ie., an absence of USI in women with symptoms of stress urinary incontinence, occurred in 14% of UD tests. It was more common in younger women with good urethral function. Clinical and sonographic measures of pelvic floor muscle function were not predictive of an unexpectedly negative result for USI, arguing against a major role for pelvic floor muscle function in urinary continence.

Concluding message

Unexpectedly negative USI in patients with symptoms of stress urinary incontinence is more likely to be found in younger women with a lower degree of anterior compartment prolapse and good urethral function.

References

1. Int Urogynecol J 2013; 24: 269-274
2. Int Urogynecol J 2011; 22: 1085-1097

Disclosures

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