

ASSESSMENT OF PELVIC FLOOR MUSCLE EXERCISES IN WOMEN WITH INCONTINENCE AND NORMAL CONTROLS

Hypothesis / aims of study

In a previous clinical study using transabdominal ultrasound, it was found that 43% of women with incontinence and prolapse depressed the pelvic floor when attempting to do a lifting contraction of the pelvic floor muscles (PFM), and that pelvic floor depression was more common in women with symptoms of urge urinary incontinence [1]. To be effective, PFM exercises need to elevate not depress the pelvic floor. The aims of this study were to use transperineal ultrasound to assess the ability of women to elevate the pelvic floor during PFM contraction and compare asymptomatic women to women with incontinence and secondly to compare women with defined symptoms of stress urinary incontinence to those with urge urinary incontinence.

Study design, materials and methods

A comparative study design was used to assess 120 women volunteers, aged 20-55years, who were pre-menopausal or on HRT. Asymptomatic women were grouped according to parity. Women with urinary incontinence (UI) were grouped using a urinary symptoms questionnaire[2], into stress UI and urge UI with 30 women in each group. Exclusion criteria: -mixed symptoms of UI, known neurological conditions, pregnancy, urinary tract or vaginal infection. Women in the asymptomatic groups had not had any previous PFM training, and women in the symptomatic group, no training within the last 2 years. The study received ethical approval. The women were assessed in crook lying with a comfortably full bladder by a qualified sonographer using transperineal ultrasound. (Philips HDI 5000 Sono CT). A measure of the position of the bladder neck was taken at rest and the change from the resting position was measured during PFM contraction using a standardized method. The strength of the PFM contraction and endurance (to a maximum of 30 seconds) was assessed using a Peritron perineometer. The average of three trials was calculated. Statistical analysis was performed using Pearson's Chi squared and ANOVA comparisons or Kruskal Wallis test.

Results

Results of the means (SD) of the four groups and the difference between the groups are shown below in Table 1.

Table 1

| Group | Asymptomatic | | Symptomatic | |
|-------------------------------|--------------|------------|-------------|------------|
| | Nulliparous | Parous | Stress UI | Urge UI |
| Age □ | 39.5(9) | 42.3 (5) | 46.2 (5.50) | 42.2 (8) |
| PFM TPUS mm | 0.57 (0.59) | 0.59(0.54) | 0.50(0.50) | 0.27(0.53) |
| TP US elevation: depression | 24: 6 | 26: 4 | 25: 5 | 18: 12 * |
| Peritron cmH ₂ O □ | 37.8(14) | 28.7(12) | 26.3(15) | 25.2(22) |
| Endurance (sec) □ | 13.4(11) | 15.7(12) | 8.7(8) | 4.6(5) * |

□ p < 0.05 for comparison between 4 groups

* p < 0.05 for comparison between Stress UI and Urge UI.

There was a difference for age between all four groups but, when added as a covariate, it did not alter the results. There was no difference between the groups for parity and BMI. Of the 120 women tested 27(22.5%) displayed a downward movement of pelvic floor during PFM contraction. There was no significant difference for pelvic floor depression when compared across all 4 groups but pelvic floor depression occurred more frequently in the urge UI group than the stress UI group (p=0.05).

There was a difference for strength (p= 0.017) across the 4 groups but there was no difference between the stress UI and urge UI groups. The asymptomatic nulliparous group was stronger than the asymptomatic parous group (p = 0.045) and the SUI group (p=0.019). The asymptomatic parous group could hold a contraction longer than nulliparous and

incontinent women ($p < 0.001$). The stress UI women were able to hold a contraction longer than the women with urge UI ($p = 0.001$).

Interpretation of results

The majority of women were able to elevate the pelvic floor but there were women in all of the groups in whom performing PFM exercises resulted in depression of the pelvic floor. Pelvic floor depression during PFM contraction was more common in the urge than the stress UI group. Nulliparous women were stronger than parous asymptomatic women and women with symptoms. Continent women could sustain a contraction longer than women with symptoms.

Concluding message

This study highlights the fact that many women have difficulty-performing PFM exercises correctly even in the absence of symptoms. Assessment of PFM exercises requires a variety of tests. Ultrasound allows direct visualization of the PFM contraction and therefore confirms the lifting aspect PFM contraction and is useful in retraining PFM exercise technique. In this study PF depression appears to be more common in the women with symptoms of urge UI. PFM exercises that result in pelvic floor depression could exacerbate incontinence.

References

1. *Levator plate movement during voluntary pelvic floor muscle contraction in subjects with incontinence and prolapse : A cross sectional study and review.* Int Urogynecol Jnl, 2003. **12**(4): p. 84-88.
2. *The urinary incontinence score in the diagnosis of female urinary incontinence.* International Jnl of Gynaecology and Obstetrics, 2000. **68**: p. 131-137.

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