

DIFFERENT EFFICACY OF TRANSABDOMINAL ULTRASOUND-GUIDED PELVIC FLOOR MUSCLE TRAINING BETWEEN WOMEN WITH AND WITHOUT POSTPARTUM STRESS URINARY INCONTINENCE

Hypothesis / aims of study

Pelvic floor muscle (PFM) training is effective for preventing stress urinary incontinence (SUI) in postpartum women (1). Transabdominal ultrasound (TAUS) has been conventionally used as a visual aid to PFM training for patients to learn the skill of the correct contraction of PFM. However, efficacy of this approach is not yet cleared in postpartum women immediately after experience of damage to the pelvic floor during childbirth. The aim of this study was to evaluate if TAUS guided PFM training is an adequate tool to obtain the skill of the correct PFM contraction in postpartum period, especially focusing on the differences in the efficacy of training program using TAUS between postpartum women with and without SUI.

Study design, materials and methods

This study was the prospective cohort study conducted at an obstetric hospital from June 2010 to June 2011. Ninety-two postpartum women were included. Exclusion criteria were: under the age of 20, multiple pregnancies, premature delivery, mental disease, known neurological disorder, and an inability to understand Japanese. The all women received an intensive 3 months program of PFM training from 3 months to 6 months postpartum.

The program consisted of home exercises, weekly group sessions of PFM training (60 minutes), and following individual TAUS guided PFM training (5-10 minutes; biofeedback) using Nemio 17 (Toshiba Inc. Japan) with a 3.5-5 MHz 2D ultrasound probe. When women performed the contraction of the PFM correctly, displacement of the bladder base in the cranioventral direction could be seen by TAUS. The number of observed successful PFM contractions out of the 10 repetitions for each session was calculated.

The women were divided into two groups: the SUI group and the non-SUI group, according to questionnaires about urinary incontinence (International Consultation on Incontinence Questionnaire-Short Form, ICIQ-SF) at the baseline of this study. The outcomes were the number of the correct contractions of the PFM observed by TAUS and the area of the levator hiatus evaluated by the 3D transperineal ultrasound (Voluson i, GE healthcare Inc. Japan). The area of the levator hiatus was assessed by a midwife at baseline and 3 months later. Differences of the area of the levator hiatus were statistically compared between the two groups using Student's t test. A two sample comparison of proportions with 80% power at the 5% level of significance required 66 women with 20% assumed prevalence of postpartum SUI and 10% estimated drop-out.

Results

73 postpartum women (79.3%) participated in PFM training program more than once and the 68 (73.9%) completed the program. In 73 postpartum women, the mean age of participants was 32.5 years (SD 4.4); the 44 women (60.3%) were primiparous; the 64 of all births (87.7%) were vaginal deliveries. Overall compliance with the program was high: the women participated in the group sessions 9.8 times on the average (SD 2.1) and performed the 3.5 sets/day (SD 1.1) of PFM training at home.

The 22 women (31.1%) were included in the SUI group. There were no differences in demographic data between two groups. At the first program session, the number of successful PFM contractions was not different between the SUI and non-SUI groups (6.3 ± 3.6 vs. 6.6 ± 3.6 , $p = 0.612$). Although the average daily number of PFM training at home was more frequent in the SUI group than in the non-SUI group (4.0 ± 0.8 vs. 3.3 ± 1.2 , $p = 0.007$), the number of successful PFM contractions until 5th sessions was significantly more increased in the non-SUI group than the SUI group (8.4 ± 2.6 vs. 9.6 ± 1.3 , $p = 0.016$). The non-SUI group women could correctly contract the PFM more than 9 times out of the 10 repetitions after the 3rd session, while the SUI group women could correctly contract the PFM after the 6th session. The area of the levator hiatus was not different between the two groups at baseline. The area of the levator hiatus reduced in both the groups after the program, although there was again no significant difference in the area reduction between the two groups. The number of the SUI positive women was reduced to 7 in the SUI group after the 3 months program.

Interpretation of results

The TAUS-guided PFM training was found to be effective for postpartum women to learn the correct PFM contraction, since the 3 months PFM training improved the morphology of the pelvic floor and the overall prevalence of SUI. The continent women seem to learn the correct contraction of the PFM easier than the women with SUI during this program, because the non-SUI group could contract PFM almost correctly within the 3rd session comparing with the 6th session in the SUI group. We consider that PFM training should be continued for more than 3 months for the SUI women, because they cannot learn the skill of the correct PFM contraction immediately.

Concluding message

The TAUS-guided PFM training was effective for postpartum women to learn the correct PFM contraction. The SUI women required longer time to learn it than the continent women. Therefore, SUI women seem to need more intensive PFM training for achieving successful improvement.

References

1. Boyle R, Hay-Smith EJ, Cody JD, Mørkved S. Pelvic floor muscle training for prevention and treatment of urinary and faecal incontinence in antenatal and postnatal women. Cochrane Database Syst Rev. 2012:CD007471.

Disclosures

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