

A GROUP PELVIC FLOOR MUSCLE TRAINING PROGRAMME INCREASES MUSCULAR CONTRACTILITY IN POSTMENOPAUSAL WOMEN: A RANDOMIZED CONTROLLED TRIAL

Hypothesis / Study goals

The pelvic floor is a neuromuscular unit that provides support and functional control for the pelvic viscera (1). The compromise of its integrity can result in stress incontinence urinary, faecal incontinence and pelvic organ prolapse.

The aging has an important role in urogynecological dysfunctions, especially in development of pelvic organ prolapse and incontinence. The hypoestrogenism usually results in notable physiological changes in woman body that can promote the development of pelvic floor dysfunctions due to changes of the bladder and pelvic structures, as well as the decline of collagen. The training of the pelvic floor muscles (PFMT) has been indicated for the prevention and treatment of stress or mixed urinary incontinence.

The aim of this study was to evaluate the effects of the pelvic floor muscle training in its contractility and the urogynecological symptoms in postmenopausal women.

Study design, materials and methods

This is a clinical, randomized, blinded and controlled study conducted at a Public Health Service Programme in Brazil that included postmenopausal women with some complaint urinary symptoms (mean age 66.11 years). The 42 volunteers included in the study were randomized by draw in two groups: PFMT in treatment group (TG) (n = 21) and control group (CG) (n = 21).

The evaluations were performed by a physiotherapist who was unaware of the treatment protocol and consisted of:

(a) digital palpation graduated according to *The Modified Oxford Grading Scale* (zero to five points);

(b) pelvic organ prolapse by Pelvic Organ Prolapse Quantification System (POP-Q);

(c) pelvic floor contractility by surface electromyography (sEMG - EMG System do Brasil®, Brazil - Model 400C) using endovaginal probe (Physio-Med Services®);

(d) urogynecological symptoms using validated versions of questionnaires: the *International Consultation on Incontinence Questionnaire – Urinary Incontinence Short Form* (ICIQ-UI SF), the *International Consultation on Incontinence Overactive Bladder Questionnaire* (ICIQ-OAB) and the *International Consultation Questionnaire on Vaginal Symptoms* (ICIQ-VS).

The subjects of the group were divided into clusters of eight to ten people for treatment. The PFMT was supervised by the principal investigator and consisted of 12 sessions, two sessions per week with 30 minutes, totalizing six weeks of treatment.

Pelvic mobility exercises, stretching, strengthening and relaxation were performed in every session in five different positions (supine, followed by sitting on the floor, then on the Gym Ball, squat and standing position), along with the PFM contractions, which were carried out consisting of four series of ten fast contractions together with four series of ten sustained contractions, lasting eight seconds followed by a sixteen second relaxation, maintaining the same positions according Marques's Protocol (2). For sEMG data analysis, five seconds of each recorded contraction (microvolt - μV) were selected. An average of three *Root Mean Square* (RMS) was calculated for each patient for comparisons. These data were then subjected to statistical analysis - Analysis of Variance (ANOVA), followed by the multiple comparison test of Tukey, contrast profile test with significance level of 5%. Subsequently, *Spearman's Correlation Coefficient* was calculated.

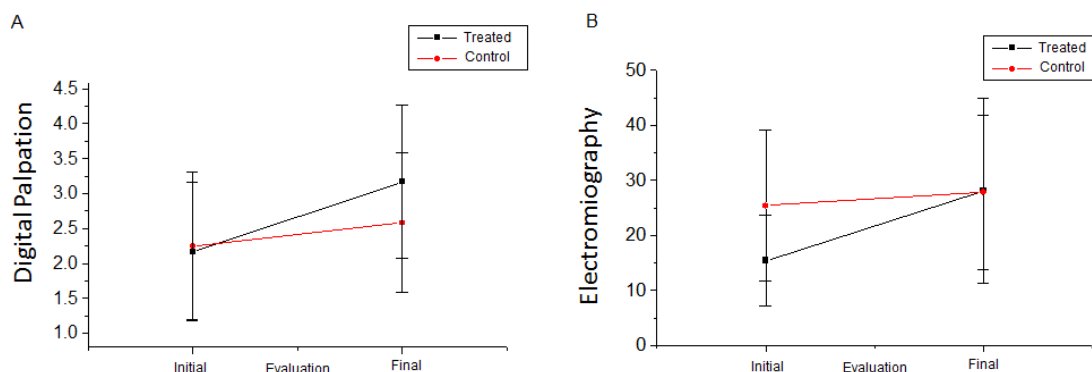
Results

From the 42 women included in the study, three women of the TG and nine women in the CG did not complete treatment or did not perform the reevaluation and were excluded from the samples. So, 30 women completed the study, 18 in TG and 12 in CG.

The groups were considered homogeneous for all demographic variables. An increase in PFM contractility ($p=0.002$) and digital palpation ($p=0.002$) after PFMT was observed in only treated group, as shown Figure 1A and 1B.

A significant improvement in urinary loss based on the ICIQ-UI SF ($p<0.01$) and ICIQ-OAB ($p<0.001$) score after PFMT in treated group was observed. No significant differences were found in the ICIQ-VS score (Figure 1C and 1D).

Figure 1E shows a significant difference between groups ($p=0.016$) and the times ($p=0.01$) of the anterior pelvic organ prolapse. No significant differences were found in the posterior pelvic organ prolapse.



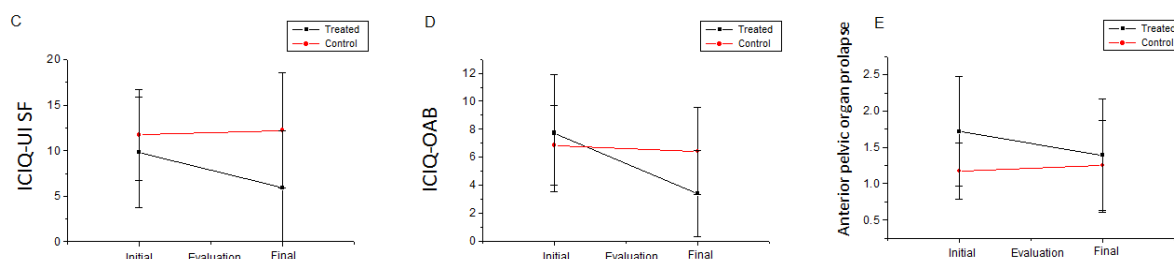


Fig 1. Results of evaluation before and after PFMT. **A:** Shows improvement of digital palpation after PFMT. **B:** shows improvement in Eletromiography after PF,MT; **C:** shows improvement of ICIQ-UI SF score after PFMT; **D:** shows that ICIQ-OAB score significantly decreased post training; **E:** Shows there was signifincantly decreased anterior pelvic organ prolapsed after PFMT.

Interpretation of the results

The PFMT is recommended by the International Continence Society (ICS) as a means of preventing and treating the pelvic dysfunctions. Our study demonstrated that the PFMT provides the increase of the contractility of the pelvic floor muscles and can be effective in controlling urinary symptoms and pelvic organ prolapse in postmenopausal women. According Dumoulin and Hay Smith et al. (2008), the PFMT can improve strength, endurance and coordination of these muscles (3). Thus, the PFMT program supervised by a trained physiotherapist should be emphasized in public health services for women in this age group.

Concluding message

The pelvic floor muscle training is an effective way to increase the contractility of the pelvic floor muscles in postmenopausal women. Consequently they were able to decrease the urinary symptoms.

References

1. Butrick CH. Pathophysiology of Pelvic Floor Hypertonic Disorders. *Obst Gynecol Clin* 2009; 36(3):699-705.
2. Marques J, Botelho S, Pereira L et al. Pelvic Floor Muscle Training Program Increases Muscular Contractility During First Pregnancy and Postpartum: Electromyographic Study. *Neurourol and Urodyn* 2012; Epub ahead of print
3. Dumoulin C, Hay-Smith J. Pelvic floor muscle training versus no treatment for urinary incontinence in women. A Cochrane systematic review. *Eur J Phys Rehabil Med*. 2008 Mar;44(1):47-63.

Disclosures

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