Brazilian Journal of Physical Therapy 2018;xxx(xx):xxx–xxx

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Associação Brasileira de Pesquisa e Pós-Graduação em Fisioterapia

Brazilian Journal of Physical Therapy

https://www.journals.elsevier.com/brazilian-journal-of-physical-therapy

ORIGINAL RESEARCH

Effects of three interventions in facilitating voluntary pelvic floor muscle contraction in women: a randomized controlled trial

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Received 6 August 2017; accepted 19 December 2017

KEYWORDS
Pelvic floor;
Physical therapy;
Facilitation;
Muscle contraction;
Electrical stimulation;
Vaginal palpation

Abstract
Objective: To evaluate the effect of vaginal palpation, vaginal palpation associated with posterior pelvic tilt, and intravaginal electrical stimulation in facilitating voluntary contraction of the pelvic floor muscles (PFM) in women.
Methods: A randomized controlled trial in which 132 women with PFM function graded at 0 or 1 using the Modified Oxford Scale (MOS) were randomized into four groups: vaginal palpation (PG) ($n = 33$); vaginal palpation with posterior pelvic tilt (PTG) ($n = 33$); intravaginal electrical stimulation (ESG) ($n = 33$) and a control group (CG) ($n = 33$) that only received verbal instructions. The primary outcome was evaluated by the MOS and the secondary using the ICIQ-UI-SF. The assessment was performed at baseline with follow-up assessment after eight weeks.

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https://doi.org/10.1016/j.bjpt.2017.12.006

Please cite this article in press as: Mateus-Vasconcelos EC, et al. Effects of three interventions in facilitating voluntary pelvic floor muscle contraction in women: a randomized controlled trial. *Braz J Phys Ther.* 2018, https://doi.org/10.1016/j.bjpt.2017.12.006

Results A total of 69.7% of the women from PTG; 63.6% from PG; 33.3% from ESG; and 18.2% from CG ($p < 0.001$) were able to attain MOS greater than or equal to 2 after eight weeks. In comparison with CG, the PTG (OR = 10.35; 95% CI = 3.26–32.84) and PG (OR = 7.87; 95% CI = 2.53–24.47) had the most significant improvement as opposed to ESG (OR = 2.25; 95% CI = 0.72–7.06). There was significant improvement among all of the groups in UI. The largest changes respectively were noted in the PG, PTG, ESG and CG. There were no reports of adverse effects.

Conclusion: Vaginal palpation with posterior pelvic tilt and vaginal palpation were more effective interventions to facilitate PFM contraction when compared with intravaginal electrical stimulation and controls. Vaginal palpation was the most effective in improving urinary incontinence.

Clinical Trials Identifier: ClinicalTrial.gov: NCT02062242.

Introduction

Pelvic floor muscle training (PFMT) plays an essential role in the treatment of various pelvic floor dysfunctions.[1] The highest level of evidence has been related to treatment for urinary incontinence.[2] Only women who are able to properly contract the pelvic floor muscles (PFM) are eligible for PFM training,[3] but the prevalence of women unable to contract PFM appears to be high.[4,5] Two studies have indicated a prevalence of 30%–40% of women who were unable to perform a proper voluntary PFM contraction.[4,5] Tibaek and Dehlendorff[6] also found that 70% of women with pelvic floor dysfunction were unable to correctly perform a voluntary PFM contraction.

Clinically, a correct PFM contraction is felt during vaginal palpation as compression and elevation of the examiner's fingers.[7] However, there is no consensus as to the best method to facilitate voluntary PFM contraction in women who have difficulty in performing this task. Different methods such as biofeedback are recommended in the literature. Biofeedback is considered an adjunct to training that might help the patient be more aware of muscle function.[8] According to Bø and Morkved,[9] electrical stimulation and vaginal palpation can be also used to facilitate a PFM contraction.

To date, there is no randomized controlled trial (RCT) whose primary objective was to investigate the effectiveness of methods to facilitate a voluntary PFM contraction in women not able to perform a voluntary PFM contraction. Therefore, the primary objective of this trial was to assess the effect of vaginal palpation (PG), vaginal palpation associated with posterior pelvic tilt (PTG), and intravaginal electrical stimulation (ESG) compared to a control group (CG). Our secondary objective was to assess the effect of these interventions on urinary incontinence and their impact on quality of life.

Methods

This is a randomized controlled trial conducted at the Rehabilitation Center of Clinical Hospital of the Ribeirão Preto Medical School at the Universidade de São Paulo (CER-HCFMRP-USP), Brazil. This trial was ethically approved by the Research Ethics Committee of Clinical Hospital of the Ribeirão Preto Medical School at the Universidade de São Paulo (USP), Ribeirão Preto, SP, Brazil (HCRP Process No. 1918/2013) and it was prospectively registered at ClinicalTrials.gov (NCT02062242). All those who agreed to participate signed a Consent Form.

Participants

Recruitment was done verbally among women routinely referred to the Physical Therapy Service of CER-HCFMRP-USP for physical therapy treatment of pelvic floor dysfunctions. The research assistant who recruited the participants was blinded to the treatment allocation. Women, who were older than 18 years of age, with PFM function graded at 0 or 1 by the Modified Oxford Scale (MOS) for pelvic floor muscle strength, were considered eligible. Patients with neurological diseases, symptoms of vaginal or urinary tract infections, pelvic organ prolapse $\geq$ stage 2, suspected or confirmed pregnancy, or cognitive impairment that would hinder or affect the procedures were excluded. The women who did not meet the inclusion criteria also received care according to the institution's protocol.

Interventions

All of the interventions were conducted by the same physical therapist (ECLMV), who had 17 years of experience in women's health physical therapy and who had no contact with the assessments and their results. Women who were unable to perform voluntary PFM contraction, verified by bidigital vaginal palpation (i.e., with PFM function graded at 0 or 1 by the MOS), were randomly allocated to one of the four groups: electrical stimulation group (ESG), palpation group (PG), palpation with posterior pelvic tilt group (PTG) and control group (CG), defined as follows:

Electrical stimulation group (ESG): were composed of women who received intravaginal electrical stimulation.

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