1007

Nakamura M U[1], Zanetti M R D[1], Petricelli C D[1], Resende A P M[1], Toschi J[1], Sanches M[1], Alexandre S[1]
1. *Unifesp- Brasil*

ELECTROMYOGRAPHIC ANALYSIS OF PELVIC FLOOR MUSCLE CONTRACTION USING PAULA METHOD OF EXERCISES

Hypothesis / aims of study

Contraction of circular muscles (Paula method) is cited by some authors as a way to perform pelvic floor muscle contraction, and could be better than pelvic floor muscle training to treat stress urinary incontinence[1,2]. Others authors recommend contraction of orbicular muscles (e.g. those surrounding mouth) as a way to help patients who can not contract the pelvic floor muscles isolated [3].
The aim of this study was to verify the role of contraction of circular muscles (Paula Method) in the contraction of the pelvic floor muscles using surface electromyography (sEMG).

Study design, materials and methods

Observational and comparative study, with 34 women consecutively included, in reproductive age conducted throughout 2009. Those who agreed to participate in the study signed a consent form. Inclusion criteria was the ability to do a correct pelvic floor muscle contraction and didn't complaint of any pelvic floor dysfunction. Exclusion criteria was women with pathologies that could interfere on the pelvic floor contraction such as neuromuscular degeneration, and previous urogynaecology surgery. For electromyographic evaluating, it was used the equipment EMG System of Brazil® model 400C with eight-channels, that is connected into a laptop with electromyography software installed. The patient was positioned supine, with flexed knee and hip. The vaginal probe with two opposing parts of metal (Chatanooga Group ®), responsible for obtaining the myoelectrical signal was introduced by the physiotherapist in the middle third of the vaginal canal with KY lubricating gel (Johnson's & Johnson's). After the probe was positioned with metal parts placed in contact with the side walls of the vagina (lateral-laterally position), the resting electrical activity (resting tone) of pelvic floor was registered. On the second evaluation subjects were instructed to do three maximal voluntary contractions (MVC) with ten seconds of rest between contractions. Than the volunteers performed three contractions of orbicularis muscles (Paula Method) such as the orbicularis oculi, orbicularis oris, contraction of toes. In the fourth phase of evaluation, the patients were instructed to perform three maximal voluntary contractions of pelvic floor muscles (MVC) associated with contraction of orbicular muscles of the Paula Method. In each phase of the evaluation, were selected the best maximal voluntary contractions (MVC) for data analysis. After selected the best contraction out of three realized on each phase of the exam, were evaluated 5 seconds of that contraction using the software EMGLab, with subsequent analysis of Root-mean-square (RMS). For statistical analysis the SPSS (Statistical Package for Social Sciences) version 17® was used, and to analyse the possible differences in MVC between the techniques the Wilcoxon test was used with a significance level of 5% (0.05).

Results

Were included thirty-four volunteers with 28 (±6.0) years old and body mass index was 23.8 (±3.3) Kg/m^2. In the analysis of the pelvic floor resting tone, the mean value was 22.6 (±10.9) µv. With regard to MVC, we found 99.8 (±44.3) µv. When we asked to volunteers to perform the contraction of circular muscles (Paula Method), the mean value for the pelvic floor electrical activity was 23.3 (±11.1) µv. At last, the women performed contraction of circular muscles associated with pelvic floor muscle contraction, and the mean value was 91.8 (±35.3) µv.
In the Table 1 is described the statistical analysis of these data, compared in pairs.

Table 1 – Comparison in pairs

Pairs of variables	P value *
Paula Method x MVC	< 0,001
Paula Method + MVC x MVC	0,09
Resting tone x MVC	< 0,001
Paula Method + MVC x Paula Method	< 0,001
Resting tone x Paula Method	0,32
Resting tone x Paula Method + MVC	< 0,001

** Wilcoxon test adjusted by Bonferroni*

Interpretation of results

There was no significant difference between the resting tone and contraction of circular muscles for the pelvic floor electrical activity. When compared the isolated contraction of pelvic floor muscles (MVC) with the Paula Method associated with the pelvic floor muscle contraction, there was no significant difference. In fact, with regard to strengthening the pelvic floor muscles, the exercises should follow the principles: overload, specificity, and progression through the maximum voluntary contraction of MAP in the number of contractions and decreased the rest (3). The specificity can be difficult to perform without prior training, as approximately 30% of women can not contract properly MAP, and the Paula method could be a teach tool for these women (3). However, the increase of pelvic floor muscle activity did not occur with circular muscles contraction.

Concluding message

The Paula Method didn´t increase the pelvic floor muscle activity and not enhances the strength training.

References

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Was this study approved by an ethics committee?	**Yes**
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Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**