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DIFFERENCE BETWEEN NULLIPAROUS AND POSTPARTUM WOMEN PELVIC FLOOR MUSCLES ELECTRICAL ACTIVITY

Hypothesis / aims of study

Pelvic floor muscles are multilayered muscle complex that forms the base of the abdominal-pelvic cavity and contribute to pelvic contents support[1]. Widely described in literature, the delivery is considered responsible for many urogynaecological dysfunctions[2]. The aim of this study is to compare pelvic floor electrical activity between nulliparous and postpartum women. And also investigate, if the type of delivery may alter the contractile response of this muscles group with surface electromyography (EMG).

Study design, materials and methods

Multicenter, observational and comparative study, with 129 consecutively included women (54 nulliparous and 75 postpartum period women). Inclusion criteria was the ability to do a correct pelvic floor muscle contraction and didn´t complaint of any pelvic floor dysfunction. The puerperium group (only primiparaes) should be between 45 and 50 days of postpartum). Exclusion criteria was women with pathologies that could interfere on pelvic floor contraction such as neuromuscular degeneration, and previous urogynaecology surgery. For surface electromyographic (sEMG) evaluating, it was used the equipment EMG System of Brazil® model 810C with eight-channels. 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). The subjects were instructed to do three maximal voluntary contractions (MVC) with ten seconds of rest between contractions. It were selected the best maximal voluntary contractions (MVC) for data analysis.
After the selection of the best contraction, 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 Mann-Whitney test analysed the possible differences in MVC between the two groups, with a significance level of 5% (0.05).

Results

Of the 129 women included in this study, 54 were nulliparous and 75 were postpartum women. The average age, body mass index (BMI) and MVC of the nulliparous group was 26.6 (±5,4) years old, 23.7 (±2,7) kg/m^2 and 77.1 µV(± 37.2). The second group presented average age of 23.9 (±6.1) years old, 24.5 (±4.1) kg/m^2 of BMI and 37.6 µV (± 19.1) of MVC. Comparing the two groups, the nulliparous had a MVC greater than the postpartum women with p <0.001 (Table 1).
Analyzing the postpartum group, of the 75 women, 28 had vaginal delivery and the remaining 47 were submitted to cesarean section. Relating the MVC with the mode of delivery, the results were women who had vaginal deliveries had an average of 33.3 µV (± 18.0), and women submitted to cesarean section, had an average of 40.1 µV (± 19.5), not being significant with p=0,1 (Table 1).

Table 1 - Comparison of electrical activity of pelvic floor muscles during maximum voluntary contraction (MVC) between the groups studied

Variables	MVC (µV)	P Values
Nuliparous	77.1 (± 37,2)	p < 0.001*
Postpartum women	37.6 (±19.1)	
Vaginal Delivery	33.3 (±18.0)	p=0,1
Cesarean Section	40,1 (±19.5)	

* Mann Whitney test

Interpretation of results

Vaginal delivery is associated with perineal trauma[2]. It is believed that in the second stage, the pelvic floor muscles stretching can result in anatomical and functional changes in paravaginal muscles, nerves and connective tissues[1].
Moreover, the cesarean delivery has been wrongly chosen as a way to protect the pelvic floor muscles[2], but the pregnancy alone can change this region, resulting in similar dysfunctions.
The sEMG is an important tool for evaluating the pelvic floor muscles functionality. Early identification of changes in skeletal muscle EMG amplitude signal could diagnose reduced pelvic floor strength. This early assessment in puerperium period could lead to precocious pelvic floor rehabilitation.

Concluding message

In this study, the MVC was greater in the nulliparous group compared to the postpartum period women´s group. The mode of delivery, cesarean or vaginally didn't present statistical significant differences. This result suggests that cesarean section couldn´t be completely protective to pelvic floor muscles.

References

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