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PELVIC FLOOR ELECTROMYOGRAPHIC ACTIVATION IN NORMAL AND OVERWEIGHT WOMEN: A PILOT STUDY

Hypothesis / aims of study

The obesity is among the main risk factors for pelvic floor disorders. Numerous epidemiological studies have shown an association between obesity and urinary incontinence [1]. However, the exact mechanism responsible for this association is poorly understood. To clarify these relationships, this research examined the pelvic floor electromyographic activation in normal and overweight women. The hypothesis is that overweight women will have lower pelvic floor eletromyographic activation when compared with normal women.

Study design, materials and methods

This cross-sectional pilot study included eighteen nullipara continent women, sexually active. The women were allocated according to body mass index (BMI=weight/height2) in two groups: normal BMI (18 > BMI < 25 kg/m^2; age: 24,44±3,43 years; BMI: 21,06±1,73 kg/m^2) and overweight BMI (BMI > 25 kg/m^2; age: 24,0 ± 3,6 years; BMI: 25,98 ± 1,17 kg/m^2). After measuring the weight and height, electromyographic activity evaluation was carried out by the equipment MyoTrac Infinite (Thought Technology, Ltd., Montreal, Canada). The vaginal sensor (Thought Technology, Ltd., Montreal, Canada) with two longitudinal stainless steel electrodes (length 35 mm and width 10 mm) and measurement in the 3 and 9 o´clock position, was inserted 3,5cm into the vagina and participants were asked to perform three 5-s maximum perceived effort contractions of pelvic floor muscles. The women were instructed not to use abdominal, gluteal and/or hip adductor muscles during the contractions and carry out the "inward and up" movement.

For the analysis, root mean square (RMS) values were calculated across the contractions using a windowing technique (duration of 40ms and overlap of 50%). The mean and the highest computed RMS values was considered as the mean and maximum voluntary electrical activity, respectively, for each one of the three contractions. Mean values of the three trials were computed. To compare two groups, the Mann-Whitney test was used and the Pearson's correlation coefficients were calculated between the BMI, mean and maximum voluntary electrical activity. The level of significance used was 0,05.

Results

There were not observed statistical differences between normal and overweight BMI group for mean (p=0,10) and maximum voluntary electrical activity (p=0,17). The BMI did not show correlation with maximum voluntary electrical and mean activity. As expected, it was observed a positive high correlation between mean and maximum voluntary electrical activity (Table 1).

Interpretation of results

Cross-sectional epidemiological studies showed that obesity is a strong risk factor for urinary incontinence. It is known that there were a strong association between BMI, and intra-abdominal and intravesical pressure [2]. The steady increase in intra-abdominal pressure could affect the pelvic floor muscles activation in overweight and obese women. However, contrary to the initial hypothesis, in this study were not observed differences between normal and overweight BMI women for pelvic floor muscle activation.

In this study we evaluated only overweight women. It is possible that a higher pelvic floor muscles overloading is necessary to promote muscle alterations. Therefore, further studies should also evaluate obese women. Moreover, the small sample size is a limitation of this study. A larger sample size could have altered some of the results. Therefore, further research is required before definite conclusions could be drawn.

Concluding message

In conclusion, this study did not verify differences between normal and overweight BMI women for mean and maximum pelvic floor muscle activation. There were not observed correlation between the BMI, mean and maximum voluntary electrical activity.

Table 1. Pearson Product-Moment Correlation Coefficients

Variables	BMI	Maximum electrical activity
Maximum electrical activity	-0,42	
Mean electrical activity	-0,46	0,82*

*p<0,05

BMI: body mass index

References

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Disclosures
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