

IS THERE A CORRELATION BETWEEN PELVIC POSTURE AND THE STRENGTH OF THE PELVIC FLOOR MUSCLES? PRELIMINARY RESULTS

Hypothesis / aims of study

The pelvic floor plays an important role in the maintenance of continence, support of the pelvic organs and the posture stabilization. Therefore, maintaining the position of the pelvis is exercised by the balanced action of the abdominal muscles, vertebral and hip extensors. Some studies have shown that pelvic positioning has influence on the female pelvic floor muscles (PFM), thus, the aim of this study was to investigate the influence of pelvic positioning on PFM strength.

Study design, materials and methods

Clinical, analytical cross-sectional study conducted in Urophysiotherapy Laboratory of the Federal University of Alfenas (UNIFAL/MG) containing 79 women with a average age of 46.7 years old between asymptomatic nulliparous youths (n = 26) and climacterics (n = 53). All participants gave their free and informed written consent, according with the Declaration of Helsinki.

Initially, sociodemographic, anthropometric and clinical data (Consultation on Incontinence Questionnaire Short Form- ICIQ UI-SF) was evaluated. Then the examination of digital vaginal palpation was made to scale the muscle strength of PFM according to the Modified Oxford Scale. The Quantification of muscle strength was also performed by vaginal dynamometer (Brazil EMG System, model DFV 020 101 / 10®) which is capable of measuring anteroposterior compressive force in kg / force (kgf). The sensor has been introduced manually by the researcher, protected by male condom with a lubricant antiallergic gel, following the protocol described by Martinho et al (in press)¹. Three consecutive samples were taken 15 seconds records, followed by a rest period of three minutes each

The pelvic posture was evaluated for a second investigator who photographed the volunteers in bathing suits. With the participants in the standing position the following anatomical points were marked: right anterior superior iliac spine and right posterior inferior iliac spine, which were the references for tracing the retroversion and anteversion pelvic angles², or the neutral position of the pelvis (zero degree angle). The digital camera was positioned in the previously marked place on a tripod leveled 1m from the floor, parallel to the ground and 2.4m away from the participant.

Data vaginal grip strength were processed through the terminal unit software (calculated from the difference between the highest and lowest values of the force graph)¹. Considering the maximum force value, in kgf, it was then calculated the average of the three taken samples. Digital photographic records were analyzed using the Alcmagem®-2000 software (v.1,5), considering three measured angles.

The linear correlation coefficient of Spearman was used to correlate numerical variables, using the SAS System software for Windows (Statistical Analysis System), version 9.2. SAS Institute Inc, 2002-2008, Cary, NC, USA. The significance level was set in 5%.

Results

Relating to the sociodemographic and clinical characteristics of the study population, young women were nulliparous and asymptomatic, while, among menopausal women, 73.6% (39/53) had urinary loss complaints during their daily activities, investigated according to the ICIQ-UI SF. Although the high incidence of urinary incontinence among these women, the correlation between the ICIQ-UI SF score and vaginal grip strength data were not significant ($r = -0.19551$, $p = 0.1606$) neither it was found a significant correlation between the ICIQ-UI SF score and the anteversion and posterior pelvic tilt angles measured ($r = -0.19392$, $p = 0.1641$).

When considering the assessment of pelvic posture in the total study population (n = 79), it was observed that 51 women (64.6%) had posterior pelvic tilt (22 young nulliparous and 29 weather) while 28 women (35.4 %) had pelvic anteversion (4 young nulliparous and 24 weather). None of them has a neutral position.

The correlation study between PFM strength evaluated by vaginal grip strength (kgf) and the anteversion and posterior pelvic tilt angles ($r = -0.24$; $p = 0.03$), indicating low correlation between variables (Figure 1).

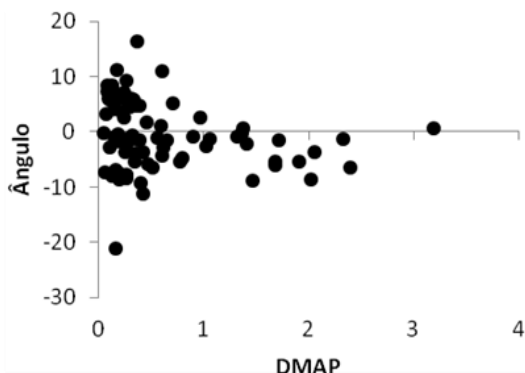


Figure 1: Correlation between grip strength of the PFM and pelvic weighbridge angle

Interpretation of results

Although there is consensus on the fact that a balanced posture is essential for the proper functioning of the musculoskeletal structures, postural assessment is a complex and difficult to measure phenomenon.

We found an increased prevalence of pelvic tilt among women in this study, however, despite significant ($p = 0.03$), the correlation between the angle and the force of the PFM measured by the vaginal dynamometer was "poor" ($r = -0.24$). Considering the anatomical insertion of the levator ani, distributed between the pubis and the coccyx³, it is assumed that the angle at retroversion could trigger this muscle shortening, whereas the reverse, pelvic tilt, would take its position in distension situation, followed, many times, by an increase in lumbar lordosis, which could compromise the pelvic biomechanics and functionality of the muscles involved.

Concluding message

The evaluation of the correlation between the anteversion and posterior pelvic tilt angles and the strength of the pelvic floor muscles showed a low correlation, suggesting some relation between them. We emphasize the need for further studies to prove this hypothesis.

References

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2. Iunes DH, Castro FA, Salgado HS, Moura IC, Oliveira AS, Bevilacqua-Grossi D: Confiabilidade intra e interexaminadores e repetibilidade da avaliação postural pela fotogrametria. *Rev Bras Fisioterapia* 2005; 9(3): 3273-3234.
3. Raizada V, Mittal, RK: Pelvic floor anatomy and applied physiology. *Gastroenterol Clin North Am.* 2008; 37(3): 493–515.

Disclosures

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