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WHAT IS THE IMPORTANCE OF VAGINAL PROBE POSITION ON PELVIC FLOOR SURFACE ELECTROMYOGRAPHIC ASSESSMENT?

Hypothesis / aims of study

In clinical practice, the surface electrode or vaginal probes are commonly used with high sensitivity to the perineal region[1]. But the interpretation of signals can be influenced by other muscles due to lack of standardization of the position of the patient and the electrode.
The aim of this study is to investigate the importance of vaginal probe position on the evaluation of pelvic floor by surface electromyography.

Study design, materials and methods

Multicenter, observational and comparative study performed on January and February 2010, which sample was constituted by 29 women consecutively included. 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 810C with eight-channels (Figure 1). The patient was positioned supine, with flexed knee and hip. The vaginal probe (Figure 2) 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), subjects were instructed to do three maximal voluntary contractions (MVC) with ten seconds of rest between contractions. On the second part of the evaluation, metal parts of the probe were positioned in contact with anterior and posterior vaginal wall (anteroposterior position), and again subjects were instructed to do three maximal voluntary contractions (MVC) with ten seconds of rest between contractions. In each positions of the vaginal probe, were selected the best maximal voluntary contractions (MVC) for data analysis.
After the selection of the best contraction, we 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 probe positions the Wilcoxon test was used with a significance level of 5% (0.05).

Results

The 29 women enrolled in study were 27.9 (±6.3) years old with a body mass index (BMI) of 23.9 (±3.2) kg/m2. When the vaginal probe was positioned lateral-laterally the MVC was 97.9 (±46.6) µV and anteroposterior position presented significantly lower MVC of 56.9 (±28,3) µV with $p < 0.001$.

Interpretation of results
Currently, surface electromyography (EMG) is being used as a differential method for assessing pelvic floor muscles (PFM). This tool captures the electrical activity of skeletal muscles and voluntary responses to reflex contraction via surface electrodes or vaginal probes[2]. Although not quantify muscle strength, can indicate whether the muscle has adequate strength through the analysis of EMG amplitude during maximal voluntary contraction[3].
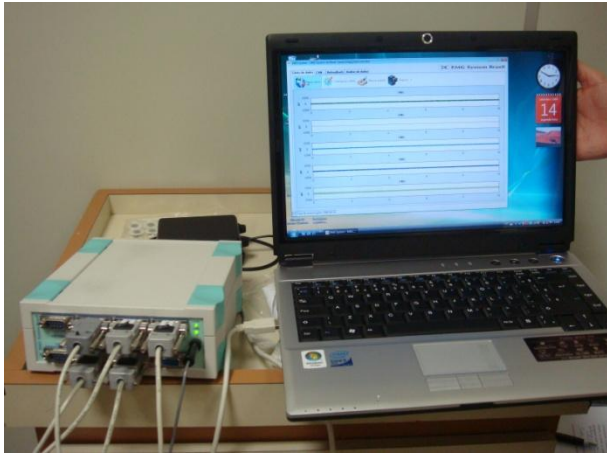As found in the literature[1], surface electromyography (EMG) evaluation needs standardization (patient position and vaginal probe position) for better results. The results of this study showed that the better myoelectrical signal was presented when the vaginal probe was positioned lateral-laterally.

Concluding message

In this study was observed that vaginal probe positioned lateral-laterally presented the best amplitude and captation of the electromyographic signal. We suggest that this probe position should be standardized in other studies.

Figure 1 – Equipment EMG System of Brazil® model 810C with eight-channels   **Figure 2 – Vaginal Probe**

References
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