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EFFECT OF OSTEOPATHIC MANIPULATIONS ON THE PELVIC FLOOR MUSCLE ACTIVITY IN WOMEN WITH PELVIC FLOOR DYSFUNCTION USING AN ELECTROMYOGRAPHIC ANALYSIS.

Hypothesis / aims of study
This study aimed to identify the presence of any osteopathic lesions on the pelvis of women with pelvic floor disorders; to treat them by structural and functional osteopathic tecniques; verify what happened to the base tone, to the activity of the fast and low pelvic floor muscle fibers, through an electromyographic analysis.

Study design, materials and methods
Quantitative study, cross-sectional, interventive and comparative, held in the Centro Universitário Estácio do Ceará (Social Responsability Project - SRP), in Fortaleza/CE/Brazil. In the SRP the participants were screened. The inclusion criteria were age above 35 years old and the presence of any pelvic floor disorder complaints in the last three months. The exclusion criteria were the presence of neurological disorders and urinary or anal infecction. Data was collected on September 2012, after the approval by the research ethics committee (by the report #2012/64). Women were interviewed by one only physiotherapist who evaluated the pelvic floor with the use of an electromyographic (EMG) biofeedback (Miotool Uro 2008/Miotec) before and after the osteopathic tecniques. Two other physiotherapists identified the presence of any osteopathic lesions on the pelvis of the participants, and treated them by structural and functional osteopathic tecniques. A total of 10 women, between 37-68 years old, were included in the protocol. Data was coded and transferred to the software Graphpad Prism 5.0 for Windows. Statistical analysis used Spearman's Correlation test, because the Kolmogorov-Smirnov normality test showed that there was not a normal distribution. The same normality test was used for before and after comparisons of the osteopathic tecniques, followed by the t test for paired samples. The results were considered statistically significant if $p \leq 0.05$.

Results
There were ten women with a mean age of 51,1 years old (sd= 3) in the study. Pelvic floor symptoms were stress urinary incontinence (SUI – n=4), mixed urinary incontinence (MUI – n=3) and urgency urinary incontinence (UUI – n=1). One patient had only urgency and another presented with pelvic pain. Seven women with urinary incontinence (UI) referred other symptoms: two women had nocturia, one had nocturia and nocturnal enuresis, two women had nocturnal enuresis, two had dyspareunia and pelvic pain and one was found to have pelvic organ prolapse (POP) grade 3. The osteopathic evaluation found that all women had a dysfunction of the iliac or sacrum. Five women had iliac lesion (anterior lesion in three participants and posterior in two of them). Other five women had sacrum lesion (four in torsions and one unilateral lesion). The statistical analysis showed no correlation between sacro-iliac osteopathic disfunction and the increase or decrease of pelvic floor muscle activity. The mean base tone muscle activity before the intervention was 4,82 ± 0,54, and after intervention became 4,11 ± 0,74 (p=0,118). The analisis of the fast fibers showed that before intervention was 8,42 ±1,25 and after became 8,87 ±1,56 (p=0,2402). The slow muscle fibers had statistically significant increase of muscle activity (p<0,05) (before intervention was 10,43 ± 1,52 and after became 11,47 ± 1,42).

Interpretation of results
Resuls showed that the base tone muscle activity and the fast muscle fibers, before and after the intervention had no statistical relevance. However, results revealed that the slow muscle fibers increased significantly after the procedure. It is important to highlight that muscle tone express the mechanical proprieties of the muscle, that is, elastic properties (determined by the connective tissue, formed by non-contractive passive components) and contractive properties (the muscle fibers). As the electric muscle activity increases, more motor units activated and, consequently, greater is the capacity to generate force. Previous studies reported that the basal electrical activity of the pelvic floor muscles is 2-3 microvolts, and in women with urinary incontinence, anal and sexual dysfunction these values were high [1]. It is common in cases of sacroiliac dysfunction to occur an increase in tension between the ligaments, which leads to compression of the pudendal nerve. Thus, the stiffness of the pelvic floor muscles (increased tone and electrical activity at rest) may be caused by the compression of the pudendal nerve leading to pelvic pain. On the other hand, pelvic floor muscles hypotonia may decrease the excitatory sensation during intercourse or be the cause factor of continence dysfunction [1]. Given this, the osteopathic therapy can be used as an auxiliary therapy for this condition, as it is believed that the pelvis without restriction on mobility can provide the balance of myofascial tensions inside the abdominal cavity and the pelvic organs. As a consequence, the therapy might improve this organs' functions and increase the activity of the pelvic floor muscles. Furthermore, the osteopathic treatment aims to restore motor function, motility, lost mobility and to minimize the abnormal tissue tension [2, 3].

Concluding message
The study results suggests that osteopathic manipulation significantly alters the activity of the slow muscle fibers (tonic), but not statistically modify the basal tone and fast fibers; although it has been observed by EMG that, depending on the pelvic floor disorder referred by the volunteers, the basal tone seems to balance after the intervention - in five out of eight patients with urinary dysfunction the basal tone increased; whereas the two with painful symptoms, there was a decrease in the tone. This fact was

not statistically significant due to the small sample, but should be considered in future studies that try to relate the pelvic mobility with pelvic floor dysfunction and introduce this therapy as a treatment method or adjuvant in pelvic floor rehabilitation.

References

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Disclosures

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