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MULTIDIMENSIONAL LOADS DISTRIBUTION ALONG THE VAGINAL CAVITY IN POMPOIR PRACTITIONERS

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INTRODUCTION

Pelvic floor (PF) muscular training are recommended as first line conservative management for the treatment/ prevention of a variety of types of urogynecological dysfunctions (Dumoulin, 2016), and should account for a myriad of factors such as speed, strength, timing, symmetry and coordination of the PF muscles deep and superficial portions (Devreese, 2004, Haylen, 2010). The pompoir practice is a millenary PF muscle training that includes exercising and controlling the PF action over the entire vaginal cavity, aiming to coordinate discriminatively different portions of PF muscles. However, the outcomes of its practice in terms of loads distribution along the entire vaginal cavity are still to be described. Our aim was to investigate the potential coordination of the superficial and deep portions of the PF muscles in pompoir practitioners, by describing a multidimensional map of load distribution along the vaginal cavity.

METHODS

Forty healthy adult women (23 controls, 17 *pompoir* practitioners for at least 6 months of experience) were evaluated by a non-deformable sensor probe fully instrumented with a 10x10 matrix of capacitive transducers (Pliance System, Novel). This device has an insertion length of up to 7 cm and a width of 2.55 cm, and a measurement range of 0.5-100 kPa and a resolution of 0.42 kPa. Prior to each test, the device was covered with a condom and lubricated with hypo-allergen gel. Pressure-related variables were calculated for the entire matrix region, and for 3 sub-regions of the probe (caudal, medial, cranial) while performing two PF tasks: (1) endurance: 10s sustained PF contraction; (2) waveform contraction: caudo-cranial PF contraction and cranio-caudal PF relaxation. Statistical comparisons were performed between groups and regions by 2-way ANOVAs ($p<.05$), followed by Newman-Keuls post hoc tests.

RESULTS

For the endurance task (figure), we observed lower peak and pressure-time integrals in cranial compared to other sub-regions (medial and caudal), for both groups (large effect). The *pompoir* group presented a larger contact area in cranial compared to controls (large effect). For the waveform task, the *pompoir* group showed a lower peak (moderate effect), an anticipation of peak pressure (moderate effect) and a smaller relaxation rate (large effect) compared to controls.

DISCUSSION AND CONCLUSION

The vaginal high-pressure zone has been described as asymmetrically distributed along different regions of the vaginal cavity, increasing pressure in all directions during PF contraction, but mainly in the mid anterior and posterior, suggesting compression of the vaginal wall between urethra and anal canal (Guaderrama, 2005; Raizada, 2010). The *pompoir* practice seems to modify the high-pressure zone of the vaginal cavity, smoothing loads along the entire cavity and may influence the coordination of the PF action, probably as result of the increased participation of muscle groups, portions or layers, that would lead to a more symmetrical load distribution map. We cannot discriminate the participation of each muscular portion, nor describe the functional benefits of these results; however it is shown that the PF potential training goes beyond the strength and stretching recommended practice, altering the spatiotemporal distribution pattern of pressures and coordination of the PF.

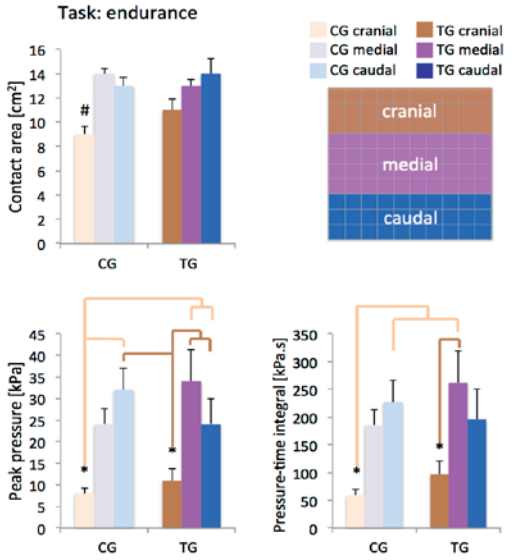

Figure. Contact area and pressure-related variables (mean and SE) in 3 sub-regions in control (CG) and *pompoir* group (TG). *Conditions different from the marked regions and groups; #Condition different from all others.

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