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DYNAMOMETRIC ASSESSMENT OF THE PELVIC FLOOR MUSCLE FUNCTION IN WOMEN WITH AND WITHOUT PROVOKED VESTIBULODYNIA

Hypothesis / aims of study

It has been suggested that pelvic floor muscles (PFM) play an important role in provoked vestibulodynia. A few studies have compared pelvic floor tonicity or resting activity in women with or without vestibulodynia [1-3]. The controversial results may be explained by methodological issues associated with the pelvic floor assessment tool, such as the subjectivity of digital palpation or the confounding factors affecting electromyography, particularly when comparing resting activity between subjects. Consequently, a PFM evaluation tool was developed to overcome these limits and to carry out a comprehensive assessment of the pelvic floor function. The purpose of this study was to compare pelvic floor muscle function in women suffering from vestibulodynia and in asymptomatic women using a dynamometric speculum.

Study design, materials and methods

Fifty six asymptomatic and 56 women suffering from provoked vestibulodynia were recruited from newspaper ads and posters. The diagnosis of provoked vestibulodynia was confirmed by a gynecologist based on interview and physical examination (including the cotton swab test). All the participants were nulliparous and had no other urogynecological conditions. The participants were evaluated in a supine lying position by an experienced physiotherapist. Information about contracting their PFM was given and their ability to contract was verified by digital assessment.

The pelvic floor muscle function was assessed using an intra-vaginal dynamometric speculum in five conditions: **1-**To evaluate the **initial passive resistance**, the women were asked to relax their PFM as much as they could. Resting forces were recorded with the speculum branches closed (10-mm vaginal aperture). The mean of two trials was considered; 2- For the **passive resistance at maximal aperture,** the aperture was determined by the patient tolerance and increase in EMG activity. The mean of two trials was calculated); **3-** For the **maximal strength trial**, subjects were instructed to contract their PFM maximally for 10 s. The maximal force value was calculated as the peak force value during the effort minus the baseline value recorded just before the beginning of contraction; **4-** To evaluate the **speed of contraction**, women were instructed to contract maximally and relax as fast as possible during 15 s. The parameters evaluated were the speed of contraction calculated by the mean slope of the ascending curve of the first contraction, the speed of relaxation estimated by the mean slope of descending curve, the first contraction, as well as the number of contractions performed. **5-** During the **endurance** measurements, the participants were asked to maintain a maximal contraction for 90 s. The normalized area under the force curve (area / maximal force) *100) was utilized as the endurance parameter. To avoid muscle fatigue, the trials were separated by a by a 2-min rest period. Independent t-tests were used to compare the PFM function between the two groups.

Results

The two groups were similar in age (asymptomatic 25.4 years (SD 5.7) and vestibulodynia 26.5 years (SD 6.0)) and frequency of vaginal intercourse per month (asymptomatic 5.2 times (6.2) and vestibulodynia 6.4 times (8.6)) ($p>0.05$). In the vestibulodynia group, the mean duration of symptoms was 6.0 years (SD 5.5) and they reported a mean pain intensity during vaginal intercourse of 6/10 (SD) on a visual analogue scale. Table 1 shows the PFM function in women with provoked vestibulodynia and controls.

Table 1 – PFM function

Conditions	Parameters	Mean (SD)		P-values	Eta-Squared
		Asymptomatic	Vestibulodynia		
1) Initial resistance	Passive forces (N)	1.03 (0.67)	1.36 (0.75)	0.015*	0.05
2) Resistance at maximal aperture	Passive forces (N)	4.57 (1.78)	3.74 (1.48)	0.009*	0.06
	Aperture (mm)	18.68 (4.55)	11.31 (3.71)	0.001*	0.44
3) Maximal strength	Maximal force (N)	2.98 (1.55)	2.34 (1.25)	0.018*	0.05
4) Speed of contraction	Slope of the ascending curve (N/s)	5.29 (3.92)	3.43 (2.66)	0.005*	0.07
	Slope of the descending curve (N/s)	-3.23 (2.71)	-2.86 (2.18)	0.436	--
	Number of contractions (count)	10 (3)	8 (3)	0.001*	0.14
5) Endurance	Normalized endurance (%*s)	2196.16 (832.09)	1814.05 (790.94)	0.017*	0.05

The magnitudes of differences in the means varied from moderate (Eta-squared ≥ 0.05) to large (Eta squared ≥ 0.14). All measurements are expressed as mean (SD). Significant difference: $p<0.05$ *

Interpretation of results

Women suffering from vestibulodynia demonstrated higher passives (also called tonicity/tension) at minimal aperture. Moreover, because of their pain, the women with vestibulodynia did not tolerate as much aperture as did asymptomatic women. Therefore, the resistance at maximal aperture was higher for the asymptomatic group because it was evaluated at larger apertures. Women with vestibulodynia had significantly lower strength and endurance. Moreover, they had less speed of contraction as reflected by an inferior slope of the ascending curve and a lower number of contractions achieved.

Concluding message

This research provides objective evidence that PFM is impaired in women suffering from vestibulodynia. Our results suggest that, in addition to increased muscle tension, women with vestibulodynia present other muscle deficits such as lack of strength, speed of contraction and endurance. These findings support the rationale for pelvic floor muscle rehabilitation in women suffering from vestibulodynia.

References

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Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**