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DOES THE INVOLVEMENT OF PELVIC FLOOR MUSCLES DIFFER IN PRIMARY AND SECONDARY PROVOKED VESTIBULODYNIA?

Hypothesis / aims of study

Chronic pelvic pain, and more precisely vulvodynia, is a highly debilitating condition affecting 7-8% of women. Recognized as the leading cause of vulvodynia, provoked vestibulodynia (PVD) is defined as an acute pain at the entry of the vagina when pressure is applied, or with attempted vaginal penetration. Recent studies suggested that PVD should be further characterized according to the onset of the symptoms. Primary PVD (PVD1) affects women from their first sexual intercourse, or tampon insertion, while secondary PVD (PVD2) appears after a period of pain-free sexual intercourse. There is growing evidence that these subgroups are distinct entities presenting different pathophysiological pathways in terms of genetic, inflammation and vulvar sensitivity characteristics [1]. Despite the fact that the involvement of pelvic floor muscle (PFM) alterations has been clearly demonstrated in women with PVD, no study has yet evaluated whether the PFM morphometry or function differ in women with PVD1 and PVD2. The aim of this study was therefore to investigate and compare PFM morphometry and function in women with PVD1 and PVD2. We hypothesized that women with PVD1 would have an increased tone, reduced strength and overall reduced PFM control compared to women with PVD2.

Study design, materials and methods

Two hundred and twelve women with PVD (PVD1=75 and PVD2=137) participated in the study after completing a gynecological exam to confirm their diagnosis. PFM morphometry was evaluated at rest and during maximal contraction using 3D/4D transperineal ultrasound following a reliable and validated methodology [2]. A dynamometric speculum was used to assess the PFM function (tone, strength, speed of contraction, endurance) following a reliable and validated methodology [3]. Student t-tests were used to compare PVD1 and PVD2 on morphometric and dynamometric parameters. Linear regression analyses were also computed to compare the two groups while adjusting for duration of symptoms. A priori sample size calculation on all parameters showed that the maximal sample required was 194 women to detect at least a minimal difference based on the standard error of measurement extracted from the reliability studies and standard deviations available for this population, at an alpha level of 0.05 and to reach 80% power (e.g tone SEM 0.34N; SD 0.84;sample 194).

Results

There were no significant differences in sociodemographic characteristics between women with PVD1 and PVD2. The two groups had similar age, religion, place of birth, income and education ($p>0.368$). They also presented similar pain intensity (numeric scale /10; PVD1 7.10 ± SD1.53 and PVD2 7.41 ± SD1.47; $p=0.149$) However, the mean duration of symptoms was significantly different between PVD1 (5.9 ± 3.7 years) and PVD2 (3.1 ± 2.8 years) ($p<0.001$).

As shown in **Table 1**, the PFM morphometry at rest and during contraction was not statistically different between women with PVD1 and PVD2 (adjusted or not for duration of symptoms $p\geq0.327$ and $p\geq0.137$, respectively). Moreover, regarding PFM function assessed with the dynamometric speculum, no differences were found between the two groups (**Table 2** $p\geq0.144$ adjusted for duration of symptoms; $p\geq0.118$ unadjusted t-tests).

Table 1. PFM morphometry at rest and during maximal contraction in women with PVD1 and PVD2.

Parameters	**PVD1º** (n=75) (Mean ± SD)	**PVD2º** (n=137) (Mean ± SD)	**p Value**
At rest			
Bladder neck y (cm)	2.65 ± 0.39	2.70 ± 0.45	0.646
Bladder neck x (cm)	-0.34 ± 0.39	-0.44 ± 0.48	0.379
Levator plate angle (°)	28.24 ± 8.82	30.12 ± 10.60	0.327
Anorectal angle (°)	119.41 ± 12.48	117.87 ± 11.25	0.504
Levator hiatus area (cm^2)	10.46 ± 2.06	10.72 ± 2.33	0.811
Changes from baseline during contraction			
Cranioventral displacement of the bladder neck (cm)	0.52 ± 0.32	0.51 ± 0.31	0.673
Levator plate angle excursion (°)	8.72 ± 7.25	9.28 ± 7.55	0.597
Anorectal angle excursion (°)	4.07 ± 13.30	2.79 ± 15.72	0.498
Levator hiatus area narrowing (%)	18.41 ± 14.99	17.50 ± 13.22	0.642

P-values are derived from linear regressions adjusted for duration of symptoms.

Table 2. PFM function in women with PVD1 and PVD2.

Conditions	Parameters	**PVD1º** (n=75) (Mean ± SD)	**PVD2º** (n=137) (Mean ± SD)	p Value
Tone	Passive forces at minimal vaginal aperture (N)	1.33 ± 0.84	1.42 ± 0.84	0.239
Strength	Maximal force (N)	3.15 ± 1.93	3.33 ± 2.12	0.343
Speed of contraction	Number of contractions achieved in 15s (count)	7.77 ± 2.78	8.49 ± 3.34	0.144
Endurance	Normalized area under the force curve (%*s) during a 90-s sustained contraction	1879.06 ± 895.96	1891.48 ± 1283.12	0.985

P-values are derived from linear regressions adjusted for duration of symptoms.

Interpretation of results

No differences were found between PVD1 and PVD2 in PFM morphometry and function assessed with ultrasound and dynamometry, respectively. These results suggest similar PFM alterations between these subgroups controlling or not for duration of symptoms.

Concluding message

Our findings suggest that women affected by PVD1 and PVD2 subgroups cannot be differentiated by morphometric or dynamometric characteristics. These results support that the implication of the PFM alterations in PVD is not affected by the onset of the symptoms and thus, similar physiotherapy modalities can be offered to both subgroups.

References

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