

COMPARING PELVIC FLOOR MUSCLE BIOMETRY IN WOMEN WITH AND WITHOUT DYS-PAREUNIA USING 4D REAL TIME TRANSPERINEAL ULTRASOUND

Hypothesis / aims of study

It has been suggested that pelvic floor muscles (PFM) play an important role in dyspareunia [1]. A few studies have compared PFM tonicity in women with or without provoked vestibulodynia [1, 2, 3] - which is the most important cause of dyspareunia. There are controversial results in the current literature that may be explained by methodological pitfalls associated with the pelvic floor assessment tools, such as the subjectivity of digital palpation or the confounding factors affecting electromyography. Another important issue that could bias the PFM assessment in women with provoked vestibulodynia is the pain elicited by the insertion of a finger or a probe in the vaginal cavity. The pain may trigger PFM tension (protective-like spasm) and interfere with contraction. Transperineal ultrasound assessment is promising in this population because the probe is gently applied on the perineum without causing any pain. The aim of the study was to compare PFM biometry in women suffering from provoked vestibulodynia and in asymptomatic women using 4D real time transperineal ultrasound.

Study design, materials and methods

Forty-nine women with provoked vestibulodynia and 51 asymptomatic women were recruited using newspaper ads and posters at Universities and gynecology clinics. Women with provoked vestibulodynia underwent an interview and a physical examination (including the cotton swab test) performed by a gynecologist in order to confirm their diagnosis. All the participants were nulliparous and had no other urogynecological conditions.

Participants were asked to empty their bladder just before the assessment and were then asked to lie on their back with their feet in the stirrups. A gynecologist performed all ultrasound assessments along with a physiotherapist who guided the women and supervised the test procedures. Information about contracting their PFM was given and their ability to contract was verified by digital assessment. The data was recorded using 4D real time transperineal ultrasound (GE Voluson e8 expert ultrasound system with 4–8 MHz curved array 3D/4D ultrasound transducer). The participants were instructed to relax their PFM and then, to contract maximally for 5 s. Different parameters were assessed at rest and during contraction: 1- the anorectal angle (the angle between the rectal ampulla and the anal canal); 2- the levator plate angle (the angle between the horizontal reference line and the line from the pubis to the anorectal angle), 3- the bladder neck displacement; 4- the levator hiatus area (measured in the sagittal plane at the level of the minimal diameter). The data analyses were processed offline by the investigator blinded to the participants' clinical data using the 4D view program. Independent t-tests were used to compare the PFM biometry between the two groups.

Results

The two groups were similar in age (asymptomatic 25.2 years (SD 5.8) and vestibulodynia 25.9 years (SD 5.5)) and frequency of vaginal intercourse per month (asymptomatic 5.4 times (SD 6.4) and vestibulodynia 6.7 times (SD 8.3)) ($p > 0.05$). In the provoked vestibulodynia group, the mean duration of symptoms was 5.6 years (SD 4.6) and they reported a mean pain intensity during vaginal intercourse of 6.7/10 (SD 1.9) on a visual analogue scale. Fifty-nine percent (29/49) had primary provoked vestibulodynia (present since the first vaginal intercourse) and 41 % had secondary provoked vestibulodynia (20/49) (women had painless intercourse, with the subsequent development of pain). Table 1 shows the PFM biometry in women with provoked vestibulodynia and controls.

		Asymptomatic	Provoked vestibulodynia	Pvalues
REST	Anorectal angle	117.3° ± 8,8	104.9° ± 13,4	<0.001
	Levator plate angle	26.7° ± 6.4	29.9° ± 6.4	0.013
	Hiatus area	10.8 cm ² ± 2.2	9.8 cm ² ± 1.9	0.011
CONTRACTION	Anorectal angle excursion	0.93° ± 0.39	0.62° ± 0.31	<0.001
	Levator plate angle excursion	17.1° ± 6.8	7.7° ± 7.4	<0.001
	Levator hiatus narrowing	27.1% ± 12.1	16.1% ± 9.6	<0.001
	Bladder neck displacement	0.93 cm ± 0.40	0.62 ± 0.31	<0.001

Table 1 PFM biometry in women with provoked vestibulodynia and asymptomatic women

Interpretation of results

Women with provoked vestibulodynia demonstrated a tighter anorectal angle, a larger levator plate angle and a smaller area of levator hiatus at rest compared to asymptomatic women, which suggests PFM tensions. During PFM maximal contraction, women with provoked vestibulodynia presented lower excursions of the anorectal angle and the levator plate angle, a reduced

levator hiatus area narrowing and a smaller displacement of the bladder neck. This indicates that the PFM do not contract as well in women with provoked vestibulodynia and it suggests poorer PFM strength and control.

Concluding message

This study is innovative and significant because it confirmed the involvement of the PFM in women suffering from provoked vestibulodynia. Our results suggest biometric differences in women with provoked vestibulodynia compared to controls. The fact that it is a pain-free method is important to these women because in the previous studies, the muscle deficits observed in women with provoked vestibulodynia may be caused by the pain induced by the procedure itself. Furthermore, these findings support the rationale for PFM rehabilitation in women suffering from provoked vestibulodynia.

References

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<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Institutional review boards of McGill University and Centre Hospitalier de l'Université Montréal
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes