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NEGATIVE RESULTS OF THREE-DIMENSIONAL ULTRASOUND FOR ASSESSMENT OF VOLUNTARY PELVIC FLOOR MUSCLE CONTRACTION

Hypothesis / aims of study

The assessment of the levator function by ultrasound has been found to have good agreement with intravaginal digital palpation and perineometry [1] [2] . But one would expect that any method relying on a change in the geometry of pelvic floor structure to be limited in those who have a pelvic organ prolapse (POP) or stress urinary incontinence (SUI) interfering with changed pelvic floor laxity. This study aims to test the validity of ultrasound parameters in assessment of levator function in women presenting with different pelvic floor structure changes.

Study design, materials and methods

One hundred and nine patients were invited to participate in the study: 39 POP women, 38 SUI women and 32 normal controls. Before the ultrasound tests, all the subjects were given verbal instruction of performing PFM contraction. A Voluson 730 Expert system was used with RAB 8-4MHz abdominal volume transducer. The standard midsagittal plane and volume datasets of the pelvic floor images at rest and during PFM contraction were acquired. The displacement of the bladder neck（DBN）, the percent of the sagittal hiatal diameter (SHD) shortened, the change of the levator hiatal angle (LHA) and the percent of the area of the levator hiatus (ALH) reduced were calculated.

Results

Thirteen women（5 SUI women, 5 POP women, 3 normal controls）were excluded from study because of inability to perform a correct PFM contraction after instruction. At last, 96 datasets were left (34 POP women, 33 SUI women, 29 SUI women). Comparisons of the baseline characteristics of the three groups were found non-significant difference. During the procedure from resting to maximum contraction, the displacement of the bladder neck（DBN）, the percent of sagittal hiatal diameter (SHD) shortened, the change of the levator hiatal angle (LHA) and the percent of the area of the levator hiatus (ALH) reduced were found non-significant difference among the three groups (Table 1).

Table1 Comparison of ultrasound parameters representing change of pelvic floor structures from rest to contraction among the three groups

Ultrasound Parameters	**POP group (n=33)**	**SUI group（n=34）**	**Control group (n=29)**	**P values**
Percent of the ALH reduced	0.194±0.08	0.193±0.08	0.194±0.08	NS
DBN	0.86±0.37	0.80 ±0.46	0.68±0.25	NS
Percent of SHD shortened	0.182±0.07	0.179±0.07	0.181±0.04	NS
Change of LHA	8.55±4.68	9.92±6.10	10.26±4.91	NS

Note: Values are presented as mean ± SD. NS, non-significant different; ALH, area of the levator hiatus; DBN, displacement of the bladder neck; SHD, sagittal hiatal diameter; LHA, levator hiatal angle.

Interpretation of results

Present study showed that all the parameters presenting changes of pelvic floor structure from rest to contraction were found non-significant. Although inherent limitations of this kind of ultrasound methodology, it does not allow for assessment resting pelvic floor muscle activity and timing of contraction responses and duration, may account for non-significant different results, suboptimal coaching for PFM contraction and increased pelvic floor laxity in SUI or POP women may interfere the results should not be ignored. For instance, a large lift of bladder neck may present in POP women because of lower starting position and increased fascia laxity. We speculate that the methods basing on determining morphological changes in the geometry of pelvic floor structures from rest to contraction may be not sensitive enough to distinguish the state of the PFM function presenting with difference pelvic floor structure changes.

Concluding message

Ultrasound parameters representing change of pelvic floor structures from rest to contraction may be not sensitive enough to distinguish the state of the PFM function.

References

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Was this study approved by an ethics committee?	**Yes**
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Was the Declaration of Helsinki followed?	**Yes**
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