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The use of transabdomibal vs translabial ultrasound for diagnosis and screening of bladder neck mobility: comparative study

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Hypothesis / aims of study

Bladder neck mobility evokes pelvic floor dysfunction, cause pain, urinary incontinence, being a widespread problem, the risk of surgery for prolapse or during the lifetime is high and increased with age, in overweight, after birthgiving, hysterectomy, etc. [1]. Development of valid screening method is highly recommended, because many women are silent about their problem, thus real risk of pelvic floor dysfunction is significantly higher. Ultrasound (US) has strong potential for diagnosis of pelvic floor disorders [2] and treatment of pelvic muscles dysfunction, however many methodological differences and limitations still exist. Myofascial pelvic pain evoked by myofascial trigger points is detected in large number of gynecological patients, pelvic prolapse can depend on postural imbalance and associated with generalized pelvic pain and pelvic floor dysfunction.

Hypothesis: ultrasound performed via transabdominal approach is effective detect movement of bladder neck associated with LUTS and symptoms of incontinence; might be accessible approach preferred over translabial ultrasound and suggested for screening large groups of patients. Bladder neck mobility is a manifestation of posture imbalance and myofascial disorders.

The aim was to test the hypothesis and assess the capabilities of transabdominal ultrasound for screening of bladder neck mobility.

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METHODS

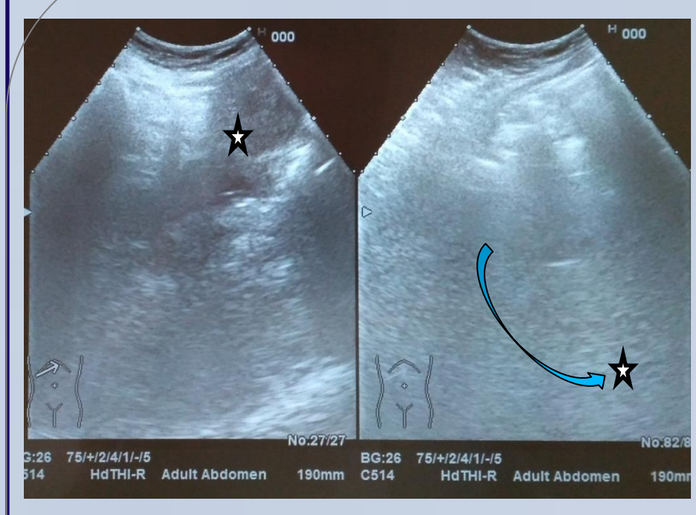
We included consecutive 40 patients, females (48–76 years, 62±8 years old), assessed into the following: group 1 (n = 20) – patients suffering from pelvic floor dysfunction, pelvic pain with different location, urinary incontinence.

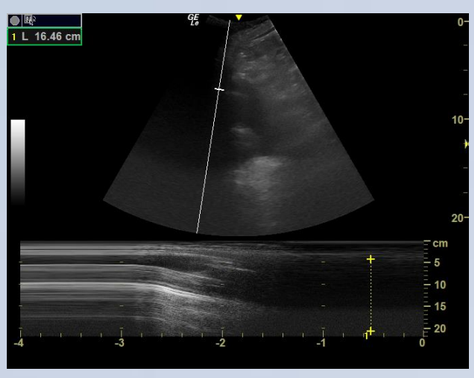
Patients of group 2 (*n* = 20) had no pelvic symptoms.

All patients underwent general gynecological examination, 0-21 scoring ICIQ (Incontinence Questionnaire), translabial and transabdominal US for evaluation bladder neck mobility. For translabial ultrasound transducer was placed against the symphysis pubis, the position of the bladder neck was determined relative to the inferoposterior margin of the symphysis pubis [2]. Measurements were taken at rest and on maximal Valsalva, and the difference yields a numerical value for bladder neck descent.

Transabdominal US measurements of bladder neck rotation (probe position over the pubic bone in vertical / sagittal orientation using M-mode, figure 1) of changing the bladder neck position in a posteroinferior direction at rest and on maximal Valsalva was performed to all patients. Additionally the transabdominal ultrasound guided testing motility by cervical tracking in gynaecological chair (down test’) was performed. All patients were also assessed for central and peripheral myofascial trigger points in pelvic and low back muscles physically and on extensive neuromuscular US using M-mode to evaluate muscles thickness, structure and motion in intervetrebral spaces, pelvis, gluteus region [3].

Our modification - transabdominal approach





Transabdominal ultrasound measurements of bladder neck rotation in a posteroinferior direction at rest and on maximal Valsalva was performed to all patients. Additionally all patients were assessed for myofascial trigger points in pelvic and low back muscles physically and on US.

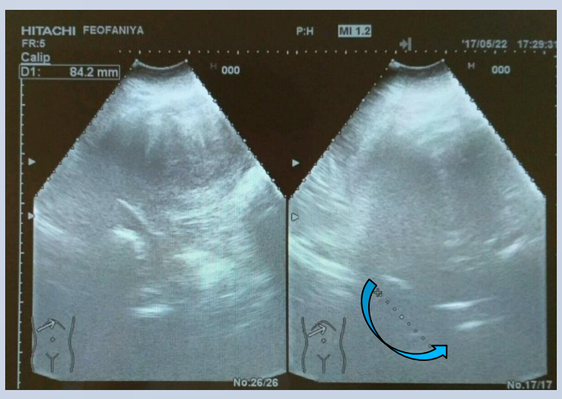
Transabdominal ultrasound measurements of bladder neck rotation in a posteroinferior direction at rest and on maximal Valsalva was performed to all patients.

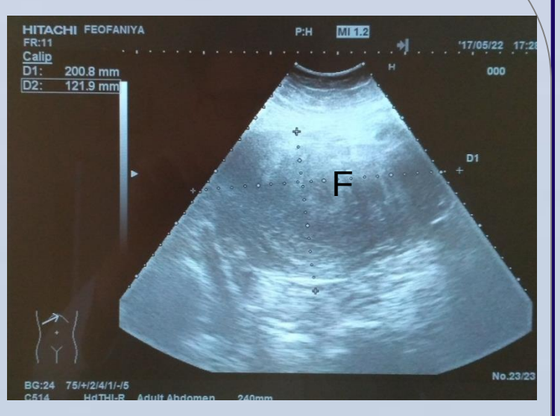
RESULTS

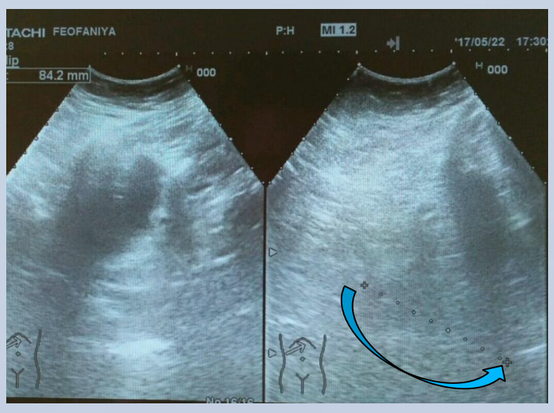
The mean ICIQ score was 16.7 ± 3.4 in group 1, and 1.4 ± 0.4 in group 2. On translabial ultrasound the proximal urethra was seen to rotate in a posteroinferior direction and was measured as 45±4.3 mm (35-55 mm) in group 1 vs 23±2.4 mm (16-35 mm) in group 2 (p <0.05). On transabdominal ultrasound on maximal Valsalva, the proximal urethra was seen to rotate in a posteroinferior direction and was measured as 87± 8.5 mm (55-130 mm) in group 1 vs 42± 5.2 mm (18-50 mm) in group 2 (p <0.01). In 6 patients of group 1 we found anterior vaginal wall compartment prolapse (“cystocele”).

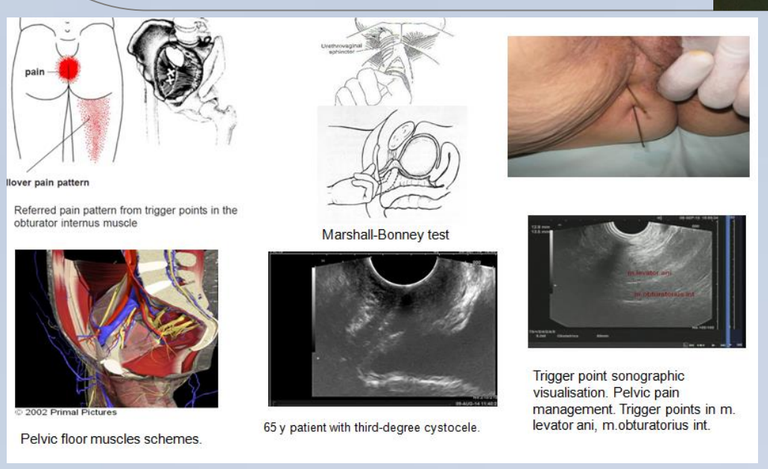
Transabdominal ultrasound data had correlation with symptoms (ICIQ Incontinence Questionnaire) (r=0.1801) and with translabial ultrasound (r=0.173).

Large fibroid & POP









In 18 patients of group 1 and in 8 patients of group 2 the myofascial trigger points in pelvic muscles were diagnosed and underwent treatment using approach by R.Bubnov [5].

Patients were considered for personalized treatment as follows: (TVT) procedure, radical or plastic surgery, either for myofacial pain treatment.

CONCLUSIONS

Transabdominal ultrasound assessment of bladder neck mobility has similar correlation with urinary incontinence symptoms as translabial ultrasound, and being more simple and accessible procedure may be suggested for screening programs of bladder neck mobility. Correlation between bladder neck mobility and trigger points in pelvic muscles was revealed.

Concluding message

This is original finding to support suggested simple and accessible approach to evaluate case of pelvic prolapse leading to LUTS in women.

Relevant US imaging techniques for assessment interaction of internal genitalia with pelvic floor muscles, resulting bladder neck hypermobility and evoking urogenital symptoms by validated questionaires conjoin with specific gynaecological background analysis, posture and microbiome [6,7] are essential for personalized management of pelvic floor dysfunction.

Integrative evaluatingof postural im/balance is essential to local detection of muscle dystonia, weakness and spasticity; combined assessment urinal microbiota data and vaginal dryness [8] can provide deeper insights towards inflammational and mechanical biomarkers to manage pelvic floor dysfunction and LUTS in women.

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