

EFFECT OF PARTURITION, AGE, WEIGHT AND ANTERIOR VAGINAL WALL DEFECT ON MORPHOLOGY OF URETHRAL RHABDOSPHINCTER IN 3-D TRANSVAGINAL ULTRASOUND EXAMINATION IN WOMEN WITH STRESS URINARY INCONTINENCE – PRELIMINARY STUDY

Hypothesis / aims of study

The urethral rhabdosphincter (RS) plays an important role in the continence mechanism in women. It has been shown that rhabdosphincter size is smaller in women with stress urinary incontinence compared with continent controls (1). Novel 3-D ultrasound transvaginal equipment substantially improves the possibility of the RS morphology evaluation.

The aim of the study was to assess the association between vaginal deliveries, age, body weight and presence of cystocele and morphology of the urethral RS on 3-D transvaginal examination as well as the relationship between the RS morphology and urodynamic parameters in women with stress urinary incontinence (SUI).

Study design, materials and methods

Subjects of the study were 25 women with SUI aged 28 to 76 years (mean 55.7 years). Parity of the women ranged between 0 and 5 (mean 2.4) and BMI between 21.0 and 39.3 (mean 29.1). The ultrasound examinations were performed with B-K Medical (Denmark) equipment using a transvaginal 9 MHz linear transducer with "free-hand" 3-D acquisition with perpendicular beam formation to the urethra and a 12-16 MHz rotational 360° transducer with a built-in 3-D mover.

Results

Equipment used in the study enabled precise visualisation of the RS, which was seen as an ovoid, hypoechogenic structure. The following parameters of the RS were detected: thickness 1.7-3.6mm (mean 2.7mm), width 24-36mm (mean 29mm), length 7-14mm (mean 10.6mm) and volume 0.22-0.79ml (mean 0.46ml). Thickness and volume of the RS were smaller in women with higher number of vaginal delivery ($r = 0.41$, $p < 0.05$ for both parameters). No associations between age or BMI and the RS morphology were found. Thickness and volume of the urethral RS were smaller in women with cystocele than in subjects without anterior wall defect (2.2mm vs. 2.7mm; $p=0.026$ and 0.32 vs. 0.46; $p=0.027$, respectively). Morphology of the RS did not correlate with any urodynamic parameters.

Interpretation of results

Our study showed that in incontinent women the decrease of thickness and volume of the RS is associated with the higher number of vaginal deliveries. Moreover, thickness and volume of the RS were smaller in women with cystocele. It may be then hypothesised that morphology of the RS reflects the morphology other pelvic muscles. Although the size of the RS is related to the number of vaginal deliveries, an established risk factor of SUI, any specific urodynamic findings can prove a relationship between the RS morphology and SUI.

Concluding message

Number of vaginal deliveries and presence of cystocele are key factors influencing morphology of the urethral rhabdosphincter in urinary incontinent women.

References

Obstet Gynecol (1999) 94; 295-301

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CLINICAL TRIAL REGISTRATION: This clinical trial has not yet been registered in a public clinical trials registry.

HUMAN SUBJECTS: This study was approved by the Bioethics Committee of Medical University of Lublin and followed the Declaration of Helsinki Informed consent was obtained from the patients.