

URETHRAL MOBILITY. DEMOGRAPHIC FEATURES.

Hypothesis / aims of study

The anatomy and function of the female pelvic floor provide optimal support for urinary bladder, urethra, uterus, rectum and intestines. It is well known that many different factors such as pregnancy, childbirth, age, body mass may affect the pelvic floor via a number of mechanisms. The intra-abdominal pressure increasing with BMI, tearing of the pubovaginal or rectovaginal fascia, damage of arcus tendineus fasciae pelvis or rectovaginal fascia connected with gravid uterus, engagement of the fetal head, and age may result in higher incidence of urinary incontinence connected with urethra hypermobility as well as with pelvic organ prolapse. Ultrasonography of the anterior perineal compartment seems to be a useful diagnostic tool in the assessment of urethrovesical junction and its mobility.

The aim of the study was quantitative evaluation of bladder neck mobility in women and its connection to various demographic features.

It has been shown that hypermobility of the bladder neck is strongly associated with SUI and morphological changes in the bladder and bladder neck occurring during pregnancy have been visualised with different imaging techniques.

Numbers of different parameters have been used to evaluate urethrovesical junction (UVJ) position and mobility, including the retrovesical angle (RVA) and the anterior angle between the UVJ and the pubic bone.

The aim of the study was to assess ultrasonographic changes in the UVJ position in relation to lower edge of pubic symphysis in pelvic floor ultrasound examination and its correlations with different demographic features.

Study design, materials and methods

The cohort of 755 consecutive female patients who underwent pelvic floor ultrasound examination between 2013 and 2016 year in the Outpatient Clinic in 1st Department Of Obstetrics and Gynecology of Medical University of Warsaw was enrolled in this study. Urethral length was measured using pelvic floor ultrasound examination with bladder filling of 304±50mL.

The position of the bladder neck was determined in the sagittal plane relative to the lower edge of symphysis pubis (fig 1)

Results

Mean bladder neck position at relaxation, tension and at Valsalva maneuver are shown in Table 1.

There was a statistically significant negative correlation between age, number of vaginal deliveries and bladder neck position during relaxation, tension and at Valsalva maneuver (Fig. 2, Fig. 3).

Mean urethral mobility (measured as the difference between the distance above lower edge of symphysis pubic at rest and the above distance during Valsalva maneuver) values are shown in Table 2. Higher urethral mobility is positively associated with the number of vaginal deliveries, and among nulliparas it is significantly lower (p<0.001) (Fig. 4). Age does not affect urethral mobility.

Group	ALL	Nulliparas
N	755	84
Relaxation	10.8 ± 6.8	14.5 ± 5.0
Tension	15.5 ± 7.5	19.4 ± 4.8
Valsalva maneuver	-4.3 ± 10.2	3.3 ± 8.6

Table 1 Bladder neck position during relaxation, tension of pelvic floor muscles and at Valsalva maneuver.

Group	ALL	Nulliparas
N	755	84
Urethral mobility (relaxation - Valsalva)	15.1 ± 8.1	11.2 ± 7.0

Table 2 Urethral Mobility

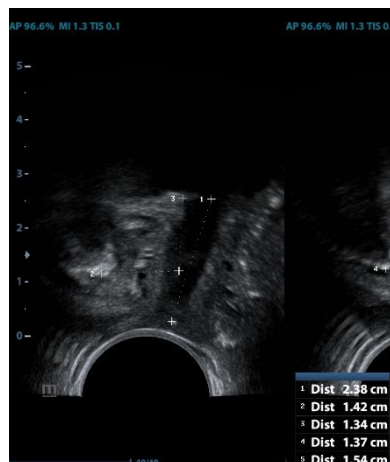


Fig 1 Bladder neck position relative to pubic symphysis

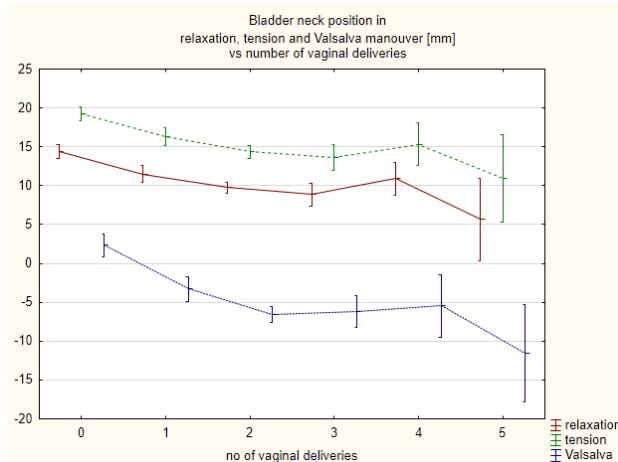


Fig 2 Mean bladder neck position after vaginal deliveries

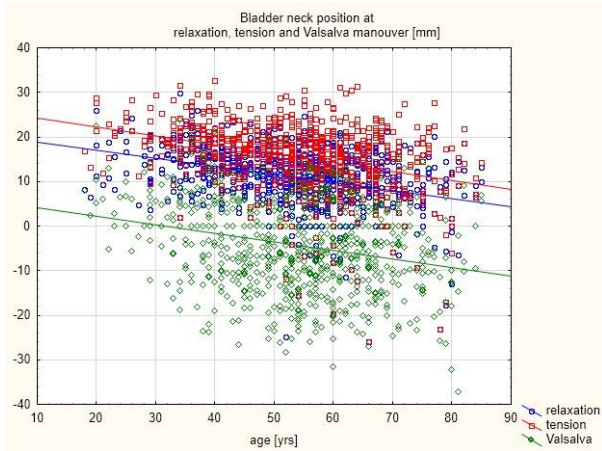


Fig 3 Bladder neck position and age correlation

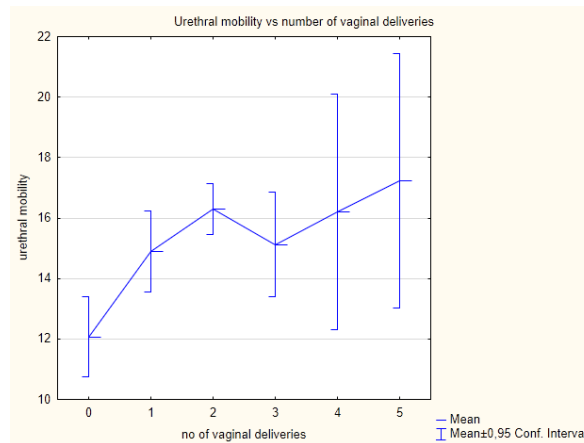


Fig 4 Urethral mobility and number of vaginal deliveries

Interpretation of results

UVJ position can indicate the capacity of the pelvic floor structures. Observed changes in the UVJ position depending on demographic factors can indirectly point influencing factors of pelvic floor insufficiency. The above analysis shows the changes of UVJ position in relation to vaginal deliveries and the age for the first time in a quantitative manner. We showed that most significant changes in UVJ are observed after first vaginal delivery with lower impact of the second and third one. The same correlation was observed in case of urethral mobility.

The lowering of the UVJ position at rest, Valsalva maneuver and tension of levator ani is also correlated with age, indicating deterioration of the pelvic floor structures and function.

Concluding message

Quantitative analysis of the influence of age and parity on UVJ and urethral mobility confirms epidemiological observations connecting those factors with deterioration of the pelvic floor function.

Disclosures

Funding: none **Clinical Trial:** No **Subjects:** HUMAN **Ethics not Req'd:** it is a retrospective study based on medical documentation **Helsinki:** Yes **Informed Consent:** No