

CORRELATION BETWEEN URETHRAL VASCULARITY AND AGE, BODY MASS INDEX AND WEIGHT IN ASYMPTOMATIC WOMEN

Hypothesis / aims of study

Structural and functional changes produced in the female urethra may explain the pathophysiology of urinary incontinence (UI). Rud et al. (1), initially, and later Delancey and Ashton-Miller (2), demonstrated that striated muscle, smooth muscle and vasculature of the female urethra contribute equally to intraurethral pressure. Recent advances in high-frequency endovaginal ultrasound (EVUS) technology enable to analyse the vascular pattern of female urethra with satisfactory resolution (3). There are very few reports in literature describing this subject. Therefore, it is mandatory to describe normal vascular pattern of the female urethra. The aim of the study is to examine the correlation of urethral vascularity and some individual patient factors (age, body mass index and weight) in a group of asymptomatic women.

Study design, materials and methods

A descriptive study in women without symptoms of urinary incontinence was designed and conducted in an Urogynaecology Unit of a teaching hospital, during 2011 and 2012. A convenient sample of 96 women between 20 and 85 years old were included. Patients with any type of urinary incontinence or history of urethral surgery were excluded. Women with pelvic organ prolapse (POPQ > 1) underwent an stress test, with a prolapse reduction during urodynamic evaluation. Patients with occult urinary stress incontinence were also excluded. EVUS using a biplane transducer (type 8848, B-K Medicals, Herlev, Denmark) with a frequency of 12 MHz was carried out to all patients. Colour Doppler examinations of the urethra were recorded as a video file according to a standardized protocol as previously reported (3). 10 second videos were evaluated off-line for quantitative vascular parameters with *Pixel Flux* software (Chameleon software, Freiburg, Germany). The following vascular parameters were measured in the axial and mid-sagittal plane: velocity (V), perfused area (A), perfusion intensity (I), pulsatility index (PI) and resistance index (RI). Spearman's Rho tests were carried out to assess the possible correlations between these parameters and age, body mass index (BMI) and weight. Furthermore, multiple regression analyses were performed to assess the power of correlations when balanced by age.

Results

Among the 96 women included, the mean age (SD) was 49.6 (11.0) years and ranged from 26 to 83. Body Mass Index (BMI) ranged from 17.4 to 38.2, with a mean of 25.2 (4.6) Kg/m². The mean weight was 66.8 (12.1) Kg. (range: 49-104 kg).

Most of parameters gave significant correlation with age (see table 1), showing a lower vascularity in older women (lower V, A and I average but higher resistance and pulsatility index).

No significant correlations were found between BMI and weight with any of the vascularity parameters. These analyses have been also performed correcting by age.

Table 1. Spearman's Rho correlation coefficients of age against vascularity parameters.

	Mid-sagittal plane	Axial plane
V average	-0,305**	-0,319**
A average	-0,409***	-0,370***
I average	- 0,376***	-0,377**
V RI	+0,369***	NS
A RI	+0,287**	NS
I RI	+0,315**	NS
V PI	+0,366***	+0,305**
A PI	+0,259*	NS
I PI	+0,246*	NS

*p<0.05 **p < 0.01 ***p < 0.001

Interpretation of results

Urethral vascularity decreases with age. Therefore, this might be a factor that contributes in the increase of prevalence of urinary incontinence with age. Colour Doppler examinations performed by high frequency EVUS may be a new tool for assessment of the women with lower urinary tract disorders, specially women with stress urinary incontinence due to sphincter deficiency.

Concluding message

High frequency EVUS allows to measure urethral vascularity with satisfactory resolution. Urethral vascular pattern decreases with age, while no correlations were found with BMI or weight.

More research is needed in order to define the exact role of urethral vascularity parameters measured by EVUS in women with lower urinary tract disorders.

References

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Disclosures

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