

TRANSVAGINAL COLOR DOPPLER ANALYSIS OF BLOOD FLOW IMPEDANCE OF BLADDER ARTERIES IN WOMEN STRESS INCONTINENCE.

Aims of Study

Stress urinary incontinence is of very complex pathogenesis. Many years of investigation on female genito-urinary system functioning revealed estrogen and progesterone receptors existence within the vagina, the urethra, the bladder and the muscles of the pelvic and the uro-genital diaphragm as well as in the muscles of the pelvic floor. The fact that estrogens concentration influences lower urinary tract and genital organs function is logical. Decrease in estrogens secretion in climacteric period causes atrophic changes in mucous membranes of the urethra and the bladder leading often to stress urinary incontinence. Estrogens enable the continence mechanism by elevating the urethral resistance, bladder threshold sensibility and the smooth urethral muscle alpha – receptors sensibility. Sex hormones, particularly estrogens deficiency replacement causes incontinence symptoms regression, and also positive alterations in urodynamic and ultrasound parameters.

Exceedingly interesting problem, in relation to difficulty in attainment to hormonal receptors, is hormonal treatment influence estimation onto vesical arteries flow parameters. Colour Doppler transvaginal sonography enables flow imaging even in small arteries and veins, and so in the bladder arteries. The aim of this study was to estimate the bladder arteries flow using Doppler technics in patients treated with estrogens for stress urinary incontinence.

Methods

12 postmenopausal patients with stress urinary incontinence symptoms were treated in Department of Obstetrics and Gynecology between 1998-1999. The age of the investigated was 49-56 years, average 53. Stress urinary incontinence diagnosis was made on patient's history, physical and urodynamic examination. Before therapy and after 6 months of treatment all patients had ultrasound examination with doppler technics performed with blood flow wave and resistance index RI estimation in bladder arteries. Siemens Sonoline Versa Pro with transvaginal 6,5 MHz probe was used. Hormonal treatment was performed according to the following schedule - vaginal tablets containing 3,5 mg estriol administered 2 times a week for 3 weeks and after that one vaginal tablet once a week up to 6 months treatment period. Situating the bladder arteries in the ultrasound causes some difficulty. Main source of bladder blood supply are inferior bladder arteries, and among smaller vessels, the superior bladder arteries. There are usually two superior bladder arteries, less often one and sometimes they are three. They determine main source of blood supply of the bladder. They take onset from umbilical artery - the visceral branch of internal iliac artery. They start from the umbilical artery before its course on lateral side of the bladder. They compose a serpent like pattern on the bladder and divide themselves into ascending and descending branches, supplying blood especially to upper and central part of the bladder. Inferior bladder artery is a thin vessel, supplying the lower part of the bladder. This artery course varies either it starts directly from the anterior trunk of the internal iliac artery, or from one of its neighboring branches. From the onset she runs along wall of pelvis, then it leads anteriorly and medially, crossing the ureter in front. From here the vesical branch leads to the bladder, supplying his bottom part together with vesical triangle.

Results

Blood flow investigations in postmenopausal women after hormonal treatment shows constant and evident decrease in blood flow resistance in bladder arteries. That results in considerable increase of bladder wall and the urethral perfusion. The results of investigations in the inferior bladder artery are shown in the table below.

RI	0.7 – 0.8	0.85 – 1.0
Before Treatment	2 patients (16%)	10 patients (84%)
After Treatment	9 patients (75%)	3 patients (25%)

Conclusions

1. Rapid increase in blood flow what is revealed by bladder arteries vascular resistance decrease can be obtained by estrogen replacement after menopause.
2. Bladder arteries flows registration can be an objective parameter in estimation of hormone therapy effectiveness in women with stress urinary incontinence.

3. Transvaginal ultrasound with Colour Doppler flow wave registration in the bladder arteries can turn out to be helpful in urine incontinence diagnosis.