

ASSOCIATION BETWEEN CONVENTIONAL URODYNAMICS, CHARACTERISTIC VARIABLES OF PATIENT PROFILE, AND SPECIFIC TYPE OF URINARY INCONTINENCE IN FEMALE PATIENTS

Hypothesis / aims of study

The aim of the study was to assess the association between patient profile characteristics, urodynamic data and specific type of urinary incontinence (UI): stress urinary incontinence (SUI), mixed urinary incontinence (MixUI), and urgency urinary incontinence (UUI).

Study design, materials and methods

A cross-sectional study was performed to investigate the association of conventional urodynamics variables and characteristic variables of patient profile with specific UI type: SUI, MixU and UUI. The first group includes patient profile variables – age, body mass index (BMI), parity, reproductive status, and presence of cystocele. The second group consists of urodynamic data: detrusor overactivity, urodynamic stress urinary incontinence, abdominal leak point pressure, maximum cystometric capacity, opening detrusor pressure, maximum flow rate, residual urine after pressure-flow study, maximum urethral closure pressure at rest, maximum urethral closure pressure at cough stress, functional urethral length at rest, functional urethral length at stress, and pressure transmission ratio.

A total of 547 women with urinary incontinence were enrolled in the study. All patients were divided into three groups according to their UI type, based on Urogenital Distress Inventory short form questionnaire and International Consultation on Incontinence Questionnaire short form. Patient history, physical examination, and conventional urodynamics - filling cystometry, pressure-flow study, and urethral pressure profilometry - were performed for all study participants. The association between patient profile characteristics, urodynamic data, and specific type of UI were assessed using one-way ANOVA and chi-square tests using SPSS software.

Results

Statistically significant correlations ($p < 0.05$) were observed between the age, BMI, presence of cystocele, menopausal status, and most of urodynamic data in at least one UI group.

Table 1. The association of analysed variables with specific types of urinary incontinence

Variable \ Group	SUI	MixUI	UUI	p
BMI*	27.4 (±5.3)	29.8 (±5.9)	28.9 (±5.9)	0.001
Maximum cystometric capacity (mL)*	353.3 (±131.6)	281.7 (±129)	279.1 (±125.2)	<0.001
Functional urethral length at rest (mm)*	35.2 (±8.7)	34.2 (±9.2)	36.4 (±8.4)	0.121
Age**	55 (45–64)	62 (53.5–70)	66 (56–70)	<0.001
Parity**	2 (1–2)	2 (1–2)	2 (1–2)	0.265
Maximum flow rate (mL/s)**	21 (15–26)	19 (13–26)	12 (9–18)	<0.001
Residual urine (mL)**	0 (0–0)	0 (0–0)	0 (0–43)	<0.001
Opening detrusor pressure (cmH₂O)**	19 (13–25)	20 (14–30)	25 (16–37)	0.008
Maximum urethral closure pressure at rest (cmH₂O)**	62 (44–79)	59 (44–80)	67.5 (51–94.3)	0.064
Pressure transmission ratio (%)**	62 (42–80)	64 (49–75)	72.5 (63–82.8)	0.002
Detrusor overactivity***	13	26	32	0.006
Urodynamic stress urinary incontinence***	40	38	8	<0.001
Menopause (%)***	61	81	81	<0.001

*Normal distribution, p – one-way ANOVA

**Not normal distribution, p – Kruskal-Wallis test

***Qualitative data, p – Pearson's chi-squared test

The mean BMI value was significantly higher in the MixUI group compared to the other two groups (LSD test). The mean maximum cystometric capacity significantly differed between all three groups (LSD test).

The functional urethral length at rest did not show any significant differences between the three groups.

Age was significantly associated with all three groups (Bonferroni test) and in the SUI group the patients were significantly younger in comparison to the MixUI and UUI groups. The maximum flow rate was significantly higher in the SUI group than in UUI group (Bonferroni test). Residual urine, opening detrusor pressure, and pressure transmission ratio were higher in the UUI group.

Two variables – detrusor overactivity and menopause showed the same results, creating significant differences between the SUI and MixUI groups, as well as the SUI and UUI groups. In both cases these variables were less frequently diagnosed in the SUI group alone. Regarding urodynamic stress urinary incontinence, significant differences were observed between the SUI and MixUI, as well as MixUI and UUI groups, with the least pronounced incontinence in the UUI group.

Spearman correlation for cystocele was negative in the SUI group: higher grades of cystocele were associated with lower tendency for SUI. On the other hand, the correlation in UUI group was positive, as higher cystocele grade carried a higher risk of UUI.

Interpretation of results

We performed a patient profile for every specific UI group.

SUI patient profile: younger patients, with reproductive potential, lower BMI, lower possibility of cystocele, larger maximum cystometric capacity, higher maximum flow rate, less detrusor overactivity during the filling phase of cystometry. MixUI patient profile: older patients, more frequently in menopause, with higher BMI, lower maximum cystometric capacity and maximum flow rate, more frequent urodynamic stress urinary incontinence, more frequent detrusor overactivity during the filling phase of cystometry. UUI patient profile: the oldest patients from all three groups, more frequently in menopause compared to the SUI group, higher BMI than in the SUI group but lower than in MixUI group, more frequent cystocele, the lowest maximum cystometric capacity and lowest maximum flow rate between all three groups. The highest residual urine, opening detrusor pressure, pressure transmission ratio. Less urodynamic stress urinary incontinence compared to SUI and MixUI groups, more frequent detrusor overactivity than in the SUI group.

Concluding message

The most sensitive way to correctly diagnose the type of UI type is to combine patient profile characteristics with urodynamic examinations.

Disclosures

Funding: none **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Ethics Committee of the Pauls Stradins Clinical University Hospital Development Society, Latvia **Helsinki:** Yes **Informed Consent:** No