

## DOES THE ONSET OR BOTHER OF MIXED URINARY INCONTINENCE HELP IN THE URODYNAMIC DIAGNOSIS?

### Hypothesis / aims of study

Mixed urinary incontinence (MUI), a combination of urge and stress urinary incontinence, is the most common type of urinary incontinence, affecting 49% women with LUTS and 59% of incontinent women in hospital and community settings. It has been shown that women with MUI have more severe incontinence than those with stress urinary incontinence (SUI) or urgency urinary incontinence (UUI) alone. Although symptoms evaluation and urodynamic testing are important in the assessment of MUI, it is well known that incontinence symptoms imprecisely predict the pathophysiologic mechanism responsible for incontinence and that different urodynamic conditions may be responsible for symptoms. The relationship between the symptoms of mixed urinary incontinence and incontinence severity, urodynamic findings and treatment response has been poorly investigated. Previous reports showed that women with MUI are 2.5 times more likely to be cured of urge incontinence by continence surgery if SUI is the primary presenting symptom than patients whose primary presenting symptom is urge incontinence. Other studies found that the treatment response is not dependent on the type of symptoms. Therefore the aim of our study was to determine whether the evaluation of symptoms severity might help the clinician assessment and management of incontinent women.

### Study design, materials and methods

Women who underwent urodynamic investigations for lower urinary tract symptoms (LUTS) were studied. Only women with urinary incontinence symptoms, who had completed a 3-day frequency volume chart, a Kings Health Questionnaire and urodynamic investigations were analysed. Women were asked whether stress or urgency urinary incontinence was the longest suffered (antecedent) symptom and which one was the most bothersome symptom at the time of urodynamic testing. All terms and definitions are in accordance with the International Continence Society. The correlation between urodynamic diagnoses and urinary symptom characteristics was studied using the Spearman rho correlation test at p value < 0.05. A version 14.0 SPSS software program (SPSS Inc., Chicago, Illinois, USA) was used.

### Results

A total of 213 women were studied. The urodynamic diagnoses and urinary symptoms reported by the women are showed on table 1 and 2.

Urodynamic Diagnosis	(n)	(%)
Detrusor overactivity (DO)	65	30.5
Urodynamic stress incontinence (USI)	49	23
Detrusor overactivity and Urodynamic stress incontinence (USI + DO)	63	29.5
Other	36	17
Total	213	100

Table 1. Urodynamic diagnoses

Urinary symptoms	(n)	(%)
Stress urinary incontinence (SUI)	196	92
Urgency urinary incontinence (UUI)	188	88
Stress and urgency urinary incontinence (MUI)	180	84
Overactive bladder (OAB)	201	94

Table 2. Urinary symptoms

Detrusor overactivity (DO) was significantly but poorly correlated with an antecedent symptom of UUI (rho = 0.189, p = 0.006), and negatively correlated with a more bothersome symptom of SUI (rho = -0.186, p = 0.006). There was no significant correlation between DO and antecedent OAB symptoms (rho = 0.091, p = 0.188) or most bothersome symptom of OAB (rho = 0.760, p = 0.272). Urodynamic stress incontinence (USI) was significantly correlated with both antecedent SUI symptoms (rho = 0.143, p = 0.037) and the most bothersome symptom of SUI (rho = 0.226, p = 0.001). It was also negatively correlated with bothersome OAB symptoms (rho = -0.178, p = 0.009). A mixed urodynamic diagnosis of DO and USI was significantly correlated with antecedent symptoms of both OAB (rho = 0.139, p = 0.043) and UUI (rho = -0.141, p = 0.040), but not with any bothersome symptoms.

	Urodynamic Diagnosis							
	DO		USI		MUI		Other	
Antecedent Symptom	Rho	p	Rho	p	Rho	p	Rho	p
OAB	0.091	0.188	-0.193	<b>0.005*</b>	0.139	<b>0.043*</b>	-0.062	0.367
UUI	0.189	<b>0.006*</b>	-0.029	0.669	-0.141	<b>0.040*</b>	-0.028	0.682
SUI	-0.144	0.035	0.143	<b>0.037*</b>	0.015	0.831	0.000	1.000
Other	-0.059	0.389	0.033	0.630	-0.029	0.676	0.068	0.320

Table 3. Correlation of urodynamic diagnosis and antecedent symptom

	Urodynamic Diagnosis							
	DO		USI		MUI		Other	
Bothersome Symptom	Rho	p	p	Rho	Rho	p	Rho	p
OAB	0.760	0.272	-0.178	<b>0.009*</b>	0.032	0.638	0.065	0.346
UII	0.121	0.077	-0.103	0.135	-0.061	0.376	0.038	0.585
SUI	-0.186	<b>0.006*</b>	0.226	<b>0.001*</b>	0.056	0.413	-0.088	0.199
Other	0.015	0.828	0.063	0.359	-0.065	0.347	-0.010	0.880

Table 4. Correlation of urodynamic diagnosis and most bothersome symptom

Interpretation of results

Women with UII as the antecedent mixed symptom are significantly more likely to have a urodynamic diagnosis of DO. Women with SUI as the antecedent symptom are significantly more likely to have a diagnosis of USI. If incontinent women reported OAB as the longest symptoms, they are likely to have an urodynamic diagnosis of USI or mixed DO and USI. Women with SUI as the most bothersome symptom are significantly more likely to have an urodynamic diagnosis of USI. Women who report OAB as the most bothersome symptoms are less likely to have USI. Finally, a mixed urodynamic diagnosis of DO plus USI is not suggested by any bothersome symptoms.

Concluding message

It has been previously hypothesized that women with MUI symptoms have urodynamic stress incontinence as their primary problem and that DO results secondarily. Accordingly to this theory, the entry of urine into the proximal urethra during physical activity, in women with an incompetent bladder neck, eliciting urethrodetrusor facilitative reflexes may trigger an involuntary detrusor contraction. However the potential for the entry of fluid into the urethra to reflexively initiate a bladder contraction has been a matter of controversy for most of the 20<sup>th</sup> century. If this theory is correct increasing the urethral outlet resistance should be offered to all the women with MUI. Contrarily, our study demonstrated that the assessment of the severity as well as the onset of symptoms rather than the condition should be the driver of the management of MUI. Finally the fact that less than 30% of women with MUI symptoms had abnormal detrusor contractions during urodynamic testing would suggest that such facilitative reflexes play a minor role in determining mixed urinary incontinence symptoms. Our study further suggests that the assessment of the predominant as well as the longest symptom in women with MUI may help predicting treatment response. In the light of our data we might conclude that in women with MUI the assessment of the onset and most bothersome symptom is a helpful guide directing the clinicians in the urodynamic diagnosis, counselling and management of incontinent women.

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<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	No
<i>This study did not require ethics committee approval because</i>	Urodynamics and assessment of LUTS are part of our routine clinical practice
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes