

Urodynamic Findings in Young Women of Less Than Forty Years Old with Lower Urinary Tract Symptoms*

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ABSTRACT

Purpose: The aim of the study was to determine urodynamic findings in young women (<40 years old) with bothersome lower urinary tract symptoms. **Materials and Methods:** The records of 315 women were reviewed during 2002 to 2010. Those with neurological disease, history of urogenital malignancies, urethral stricture or trauma, acute UTI, unsterile urine analysis, congenital urological disease, pelvic organ prolapse, diabetes mellitus or a primary complaint of stress incontinence were excluded. All completed the American Urological Association Symptom Index (AUASI) and underwent urodynamic studies. **Results:** Bladder dysfunction was diagnosed in 78.4% of the patients with urge incontinence. Bladder and voiding phase dysfunction were found in 134 (42.5%) and 110 (34.9%) of patients, respectively. Occult neurological disease was later diagnosed in 10 women (3.17%) with urge incontinence and bladder dysfunction. **Discussion:** Urge incontinence and voiding symptoms are frequently associated with urodynamical abnormalities. Urge incontinence and bladder dysfunction may be a sign of occult neurological disease in this population. The presenting symptoms are useful in determining the advantage of urodynamic study in this population.

Keywords: Urge Incontinence; Women; Urodynamics

1. Introduction

Young women with LUTS are a difficult group of patients to diagnose and treat. Irritative symptoms (frequency, nocturia, urgency, incontinence) and obstructive symptoms (straining, weak stream, intermittency, and hesitancy) have different etiologies in this group. Pregnancy and delivery can initiate the changes that cause LUTS in this population. The prevalence of LUTS in the young women has not been extensively studied yet. Previous studies have paid attention on the prevalence of stress incontinence [1]. The symptom of urge incontinence has not been investigated extensively, unless in studies that the prevalence of incontinence is explained [2-5]. The association of LUTS with urodynamic abnormalities in young women has not been studied before. In this study, we intended to determine urodynamic findings in this group. This information could be useful in selecting patients for urodynamic evaluation.

2. Materials and Methods

The records of 315 young (<40 years) women who underwent urodynamic assessment for LUTS during 2002

to 2010 were reviewed. Those with neurologic disease, history of previous incontinence or lower urinary tract reconstructive surgery, and those with urogenital malignancies, urethral stricture or trauma, acute UTI, unsterile urine analysis, congenital urological disease, pelvic organ prolapse, diabetes mellitus or a primary complaint of stress incontinence according to history and/or physical examination were excluded. All patients provided complete urological and gynecological history and underwent complete physical examination. All women completed the American Urological Association Symptom Index (AUASI) before testing [6]. The index was divided into 3 groups:

- 1) Total score;
- 2) Obstructive score;
- 3) Irritative score.

Urodynamic tests were completed in all patients. Methods, units and definitions, conformed to the standards suggested by the International Continence Society [7]. EMG was taken by surface electrodes. Filling cystometry was performed too. The existence of involuntary detrusor contractions or detrusor overactivity (DO), impaired compliance, and sensory urgency during filling were noted. Impaired compliance was defined as <12.5 ml/cm H₂O [8]. Impaired contractility was defined as a

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detrusor contraction of <20 cm H₂O, with a flow of <12 ml/s [9,10]. Patients voided in the seating position that detrusor pressure, flow rate, EMG activity, and post void residual were evaluated. Bladder dysfunction was defined as DO and/or impaired compliance. Voiding phase dysfunction was defined as bladder outlet obstruction or impaired contractility. The diagnosis of dysfunctional voiding was proposed when external sphincter activity was increasing during voluntary voiding with accompanying EMG evidence [11].

Patients were divided into 6 groups according to their symptoms (**Table 1**).

Urodynamic findings, consisting of the prevalence of bladder and voiding phase dysfunction, were evaluated in different symptoms groups. Symptoms (including AUASI and urge incontinence) and age were compared in women with or without bladder dysfunction and with or without voiding phase dysfunction. Analysis of variance (ANOVA) was used for age and AUASI, and for the fixed variable of urge incontinence a Chi-square test was used. A p value of less than 0.05 was considered as statistically significant.

3. Results

In the study, the mean age of all patients was 27 years old (ranging between 18 and 39 years old). The distribution of women for different chief complaints is summarized in **Table 1**. Some 134 patients (42%) had a complaint of urge incontinence.

1) Frequency and urgency: 5 (9%) had DO, 30 (53%) had sensory urgency, and 22 (38%) had a normal cystometrogram. Some 18 patients with sensory urgency and the other 4 with DO also had dysfunctional voiding.

2) Frequency, urgency, and pain: A number of 52 patients (72.2%) had sensory urgency, 8 (11.11%) had DO, 5 (6.94%) had impaired compliance, and 7 (9.72%) had normal urodynamics. Of those patients with sensory urgency, some 28 had dysfunctional voiding; 3 patients impaired compliance, and 1 patient with DO had dysfunctional voiding.

3) Frequency, urgency, and urge incontinence: 88 patients (65.6%) had DO, 6 (4.4%) impaired compliance,

11 (8.2%) impaired compliance and DO, 17 (12.6%) sensory urgency, and 12 (9%) had a normal CMG, respectively. Of those patients with DO, 15 had dysfunctional voiding, and 5 were later diagnosed as MS. Some 5 patients with DO and impaired compliance had abnormal sphincter activity through voiding and all were later diagnosed with neurological diseases (3 tethered cord and 2 spinal cord hemangioma). Therefore, the total 10 of 134 women (7.46%) with urge incontinence were later diagnosed with neurological disease. Two patients with DO had an obstructing urethral stricture; 11 patients with sensory urgency had dysfunctional voiding; one patient with impaired compliance plus 4 patients with impaired compliance and DO had dysfunctional voiding. Three patients with a normal CMG had primary bladder neck obstruction.

4) Obstructive or voiding symptoms: Some 8 patients (25%) had DO, 3 (9.3%) had impaired compliance, 14 (43.7%) had sensory urgency, and 7 (21.8%) had a normal CMG. A number of 5 patients with DO, 12 patients with sensory urgency, 2 patients with impaired compliance and also 6 patients with normal CMG had dysfunctional voiding. Thus, 25 of 32 patients (78%) had urodynamic evidence of obstruction.

5) True incontinence: Ten patients.

6) Suprapubic pain only: Three had sensory urgency and others had normal CMG.

Table 2 includes the prevalence of urodynamic findings of bladder dysfunction and voiding phase dysfunction among patients with different symptoms.

Some 134 women had bladder dysfunction totally that 105 women (78.35%) of this group had urge incontinence (**Table 3**). Patients who had urge incontinence had

Table 1. Patients were divided into 6 groups according to their symptoms.

Chief complaint	Number (%)
Frequency/urgency	57 (18)
Frequency/urgency and pain	72 (23)
Frequency/urgency and urge incontinence	134 (42)
Obstructive or voiding symptoms	32 (11)
True incontinence	10 (3)
Suprapubic pain only	10 (3)

Table 2. Prevalence of bladder and voiding phase dysfunction among patients with different symptoms.

Chief complaint	Bladder dysfunction (%) ^a	Voiding phase dysfunction (%) ^b
Frequency/urgency	9	38.59
Frequency/urgency and pain	18	44.44
Frequency/urgency and urge incontinence	78.2	23.18
Obstructive symptoms	34.3	78.12
True incontinence	0	0
Suprapubic pain	0	0

^aBladder dysfunction was defined as DO and/or impaired compliance; ^bVoiding phase dysfunction was defined as bladder outlet obstruction or impaired contractility.

Table 3. Patients with or without bladder dysfunction characteristics and scores.

	Bladder dysfunction (n = 134)	No bladder dysfunction (n = 181)	P
Mean age	27.5	26.6	0.43*
Mean AUASI scores			
Total score	20.5	22.7	0.13*
Irritative score	11.5	10.4	0.14*
Obstructive score	9.3	12.4	0.018*
Urge incontinence	105 (78.35%)	29 (16%)	<0.0001**

*Analysis of variance; **Chi-square test.

a significantly higher incidence of bladder dysfunction than those without it, 78.2% vs 14.3% ($p < 0.0001$). Patients with or without bladder dysfunction had similar total and Irritative AUASI scores, but obstructive scores were higher in patients without bladder dysfunction (**Table 3**).

Some 110 women had voiding phase dysfunction. Only 32 of those (22.7%) had a chief complaint of obstructive symptoms. Of the total of 32 patients with a chief complaint of voiding symptoms, some 25 patients (78%) had urodynamical voiding phase dysfunction. There was a significant difference between the incidence of the urge incontinence in the patients with voiding phase dysfunction (28%) and those without it (50%). Patients with voiding phase dysfunction had significantly higher obstructive and total AUASI scores, but similar irritative scores if compared with those without it (**Table 4**).

4. Discussion

The prevalence of urinary incontinence has been reported to be 5% - 20% in the prior studies that stress incontinence was the most prevalent type in many studies [1,2,4, 5,12,13]. Few studies have focused on urge incontinence in young women. A French study reported the prevalence of isolated urge incontinence to be zero in women with the age of less than 25 years old and 1.5% in those between 25 and 39 years old [14]. A study in central Sweden reported the rise in incontinence prevalence with age and parity, and that prevalence of pure urge incontinence was only 2.1% in 20 - 59 years old women [15].

The urodynamic study before LUTS treatment enables us to diagnose problems created by dangerous conditions

such as occult neurological diseases. Since urodynamics has low morbidity, it is better for young women to undergo urodynamics before starting the treatment.

Our study showed that urge incontinence was highly suggestive of urodynamic abnormalities. In our study, 82.8% of women with urge incontinence presented DO, voiding phase dysfunction, or both in urodynamic study, however, 73.8% of them had DO only. Ten women in this group (7.46%) were considered as occult neurological disease after neurological workup. Of those patients with the chief complaint of obstructive symptoms, 78% had voiding phase dysfunction.

Urge incontinence and obstructive symptoms are good predictors of a diagnostic urodynamic study. The complete neurological evaluation must be done for the young women with significant urodynamic abnormalities that can not be justified by other conditions. In this study, neurological evaluation was performed for 30 patients. The diagnosis of neurological disease was proposed in 10 of them, 5 with detrusor overactivity, and 5 with both detrusor overactivity and impaired compliance.

AUASI is a helpful score for explaining LUTS in women. AUASI has been used to evaluate LUTS in women [16,17], and has shown the degree of bother from symptoms and quality of life in both men and women [18]. Women with voiding phase dysfunction had higher total and obstructive scores than those without it. Irritative scores were similar to each other. Thus, in women without obstructive symptoms, the AUASI could be useful in deciding to perform urodynamics. This shows the benefit of voiding phase evaluation when perform urodynamic study [16]. The total and irritative scores in the

Table 4. Patients with or without voiding phase dysfunction characteristics and scores.

	Voiding phase dysfunction (n = 110)	No voiding phase dysfunction (n = 205)	P
Mean age	26.1	27.2	0.31*
Mean AUASI scores			
Total score	24.7	20.5	0.02*
Irritative score	11.3	10.9	0.4*
Obstructive score	13.7	9.9	0.009*
Urge incontinence	31 (28.18%)	103 (50.24%)	<0.001**

*Analysis of variance; **Chi-square test.

women with or without bladder dysfunction are similar to each other. Voiding scores were higher in women without bladder dysfunction than those with it. Therefore, the AUASI is a useful instrument in selecting young women for urodynamic performance.

Other indexes evaluated in our study were voiding diaries, intake diaries, uroflowmetry, and postvoid residual volume. Diaries were especially useful in diagnosis of excessive fluid intake as a cause of high urine output in young women. The urodynamic study was not helpful in those patients. When uroflowmetry or PVR are abnormal, it may show voiding phase dysfunction. Therefore, urodynamic study could be useful in such patients.

It may be concluded that when young women have only overactive bladder symptoms, without any obstructive complaints or neurological signs and symptoms, with normal emptying, normal urine analysis, and normal physical examination, could be treated empirically. We can also perform empiric therapy when uroflowmetry is normal.

5. Conclusion

Young women present different symptoms of lower urinary tract. Urodynamic study may be helpful in the evaluation of this group. In particular, patients with urge incontinence and voiding symptoms may have urodynamic abnormalities. Urge incontinence and bladder dysfunction can predict an occult neurologic disease. A neurological assessment is recommended for the patients that show significant urodynamic abnormalities that cannot be justified otherwise. When young women have only overactive bladder symptoms, without any obstructive and neurological signs and symptoms, with normal emptying, urine analysis, and physical examination, could be treated empirically.

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