Urodynamic Findings of the Painful Bladder Syndrome/Interstitial Cystitis: A Comparison With Idiopathic Overactive Bladder

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Abbreviations and Acronyms

Cmax = maximum cystometric capacity
CMG = cystometrogram
FDV = first desire to void
IC = interstitial cystitis
ICS = International Continence Society
IDC = involuntary detrusor contractility
MUCP = maximal urethral closure pressure
MUP = maximal urethral pressure
NDV = normal desire to void
OAB = overactive bladder
PBS = painful bladder syndrome
PST = potassium sensitivity test
Qmax = maximum flow rate
SDV = strong desire to void
UDS = fluoroscopic urodynamic study

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Editor's Note: This article is the fifth of 5 published in this issue for which category 1 CME credits can be earned. Instructions for obtaining credits are given with the questions on pages 2834 and 2835.

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Purpose: In this study we identify the characteristics of the urodynamic results in patients with painful bladder syndrome/interstitial cystitis and in those with idiopathic overactive bladder.

Materials and Methods: The fluoroscopic urodynamic study results were analyzed retrospectively in 40 consecutive female patients with painful bladder syndrome/interstitial cystitis and 78 female patients with idiopathic overactive bladder between October 2005 and August 2007. Before treatment a symptom assessment, questionnaires, 3-day voiding diary and laboratory tests were performed at the initial outpatient clinic visit. All patients had been diagnosed and grouped according to painful bladder syndrome/interstitial cystitis or overactive bladder based on the clinical features before cystoscopy, potassium chloride sensitivity test and urodynamic investigation.

Results: Mean (±SD) age of patients with painful bladder syndrome/interstitial cystitis and overactive bladder was 57.8 (±12.9) and 61.9 (±11.9) years, respectively. Maximum flow rate and voided volume based on free uroflowmetry were significantly different between the 2 groups ($p < 0.05$). For the static urethral pressure profile there was a significant difference between the groups in terms of maximal urethral closing pressure and maximal urethral pressure ($p < 0.05$). For filling cystometry the volumes at each interval (first desire, normal desire, strong desire) and the volumes at maximum cystometric capacity were significantly lower ($p < 0.001$) in patients with painful bladder syndrome/interstitial cystitis, as was bladder compliance ($p = 0.025$). No involuntary detrusor contraction was observed in the painful bladder syndrome/interstitial cystitis group but it was observed in 53 patients (67.9%) with overactive bladder (chi-square $p < 0.001$). There was no significant difference in maximal detrusor pressure on voiding and fluoroscopic results between the 2 groups ($p > 0.05$). Logistic regression analysis after adjusting for age, symptom duration, number of major comorbidities and disease groups showed that all variables in the urethral pressure profile were not significantly different between the painful bladder syndrome/interstitial cystitis and overactive bladder groups.

Conclusions: This study showed that the urodynamic results were significantly different between the painful bladder syndrome/interstitial cystitis and overactive bladder groups. Combined with other clinical findings urodynamic studies might provide additional information to confirm a diagnosis of painful bladder syndrome/interstitial cystitis.

Key Words: cystitis, interstitial; urinary bladder, overactive; urodynamics

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BASED on International Continence Society terminology PBS/IC is a clinical diagnosis based on urgency/frequency and pain in the bladder and/or pelvis.[1,2] IC and overactive bladder have similar and overlapping symptoms (urgency, increased daytime frequency and nocturia), often causing confusion in the diagnosis of PBS/IC and OAB in clinical practice. It is important to differentiate PBS/IC alone from OAB because these conditions are treated differently.

Previous studies have used UDS for comparison of the saline and potassium sensitivity test in patients with IC.[3–5] Several other studies have used UDS to evaluate bladder dysfunction in patients with IC and to compare with other voiding dysfunctions to determine the characteristics of IC.[6,7] Some patients with IC had specific urodynamic characteristics such as sensory urgency and instability, decreased bladder capacity and pain on bladder filling at low volumes.[8] However, little cumulative information is known about the detailed urodynamic characteristics of patients with PBS/IC. In this study we investigated the UDS findings in patients with PBS/IC and compared them to those of patients with OAB.

MATERIALS AND METHODS

A retrospective study was performed to analyze the fluoroscopic urodynamic data obtained between October 2005 and August 2007. Forty consecutive female patients with PBS/IC and 78 with idiopathic OAB were identified during this period. The diagnoses of PBS/IC and OAB were made according to the definition of the ICS.[1] All patients had been diagnosed with and grouped according to PBS/IC or OAB based on clinical features before cystoscopy, PST and urodynamic investigation.

Careful history taking, physical examination, symptom assessment, questionnaires and a 3-day voiding diary were performed in all patients on an outpatient basis. Urinary cultures, polymerase chain reaction kits for urinary tuberculosis, urinary cytology as well as observational cystoscopy were performed in all enrolled patients to exclude urinary tract infections, bladder cancer and genitourinary tuberculosis. Urodynamic study was also performed on an outpatient basis before any treatment was initiated. For those patients with a clinical diagnosis of IC, PST was performed before observational cystoscopic examination.

All patients received an information leaflet a few days before the procedure and agreed to stop taking bladder related medications including anticholinergic drugs, pentosan polysulfate and tricyclic antidepressants for 2 weeks before the urodynamic study. The leaflet contained technical information on the procedure and listed the possible side effects related to the UDS. All patients underwent free uroflowmetry with post-void bladder ultrasound before the UDS and the bladder was completely emptied via catheterization immediately before the individual filling cystometry. The UDS was performed according to the ICS standardization with a UD-2000 device (Medical Measurement Systems, Enschede, the Netherlands) using a biluminal single use 6Fr catheter by 1 male examiner in an identically aseptic manner.[1] A 1-day dose of a quinolone was given as prophylaxis after the procedure.

Before starting the UDS the examiner explained the 3 normal bladder sensations to the patients and taught them to say stop when they could not endure pain or strong impulse/strong desire to void any longer. The 3 bladder sensations of first desire, normal desire and strong desire as well as Cmax were measured according to the ICS definition.[1] For those 21 patients with OAB with urgency incontinence maximum cystometric capacity was measured at the point of infused volume when the incontinence began during the filling CMG.

After completing the examinations at the outpatient clinics, patients with PBS/IC were admitted for 2-day hospitalization for hydrodistention under anesthesia. Hydrodistention was performed with the patient under general or spinal anesthesia according to the procedure described elsewhere.[9] In the outpatient department the observation cystoscopy revealed Hunner's ulcers in 25 (62.5%) patients. Glomerulations were found in 29 (72.5%) patients during hydrodistention in the PBS/IC group. A total of 40 patients with PBS/IC had ulcers and/or glomerulations (table 1). However, these 2 findings were not observed in the 26 patients with OAB who underwent outpatient observational cystoscopic examination (table 1). For the PST all 40 patients with IC showed positive results.

The data from the UDS were compared using the Mann-Whitney test and the chi-square test with SPSS® (version 12.0). The logistic regression in this study was fitted using penalized maximum likelihood. The significance tests and 95% confidence intervals for the odds ratios were determined using the penalized likelihood ra-

Table 1. *Patient characteristics*

	PBS/IC		OAB		p Value (chi-square test)
No. pts	40		78		
Mean (± SD) age	57.8 (± 12.9)		61.9 (± 11.9)		0.080*
Median mos symptoms (range)	36	(12–120)	10	(4–21)	0.602*
No. major comorbidity:	5		18		0.055
Diabetic mellitus	5		15		
Hypertension	0		6		
Tuberculosis	0		0		
Hepatitis	0		0		
Systemic lupus erythematous	0		2		
Liver cirrhosis	0		2		
No. urinary symptoms (%):	40		78		
Frequency	35	(87.5)	57	(73.1)	0.054
Nocturia	29	(72.5)	54	(69.2)	0.307
Urgency	25	(62.5)	72	(92.3)	<0.001
Hesitancy	16	(40.0)	8	(10.3)	<0.001
Intermittency	12	(30.0)	11	(14.1)	0.047
Urge incontinence	0	(0)	21	(26.9)	<0.001
Pelvic pain	40	(100)	7	(9.0)	<0.001
No. cystoscopy (No. pts)	40	(100)	26	(33.3)	
No. glomerulations (%)†	29	(72.5)	0	(0)	<0.001
No. Hunner's ulcers (%)	25	(62.5)	0	(0)	<0.001

* Mann-Whitney test.
† During hydrodistention.