

# URODYNAMICS UTILITY PATTERN AMONG INDONESIAN UROLOGISTS

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## ABSTRACT

**Objective:** Aim of this study was to describe urodynamic utility pattern among Urologists in Indonesia especially in treating lower urinary tract symptoms (LUTS), urinary retention, overactive bladder (OAB), stress urinary incontinence (SUI) and urologic pediatric cases. **Materials & methods:** Subjects were Indonesian Urologists who attended urological scientific meetings or workshop in Jakarta between February-July 2014. They were given questionnaires about urodynamics and its indications. **Results:** One hundred and eight Urologists completed and returned the questionnaires out of 303 Urologists in Indonesia. Thirty eight Urologists worked at hospitals where urodynamic machine is available, the rest sent their urodynamic cases elsewhere. Most of Urologists ordered urodynamics for LUTS patients with neurological deficit (84.3%) and weak anal sphincter tone/bulbocavernosus reflex (62.0%). In OAB cases, urodynamics was used in cases with failure of medical therapy (70.4%) and neurological deficit (68.5%). Two most common indication criterias in SUI cases were failure of conservative therapy (70.4%) and mixed incontinence cases (SUI with OAB) (60.2%). Neurological deficit (66.7%) and urinary incontinence (26.9%) were the most frequent urodynamic indications applied in children. **Conclusion:** We described the urodynamic utility pattern among Indonesian Urologists. Availability of urodynamic machine, patient economic capabilities, guideline availability on urodynamics could be the factors affecting this pattern.

**Keywords:** Filling cystometry, pressure flow study, diagnosis, usage pattern.

## ABSTRAK

**Tujuan:** Penelitian ini bertujuan untuk menjelaskan pola kegunaan urodinamika diantara dokter urologi di Indonesia terutama dalam merawat lower urinary tract symptoms (LUTS), retensio urine, overactive bladder (OAB), stress urinary incontinence (SUI) dan kasus pediatrik urologi. **Bahan & cara:** Subyek dalam penelitian ini adalah dokter urologi yang menghadiri workshop & rapat urologi antara bulan Februari sampai Juli 2014. Mereka diberikan kuesioner tentang urodinamik dan indikasinya. **Hasil:** Sebanyak 108 dari 303 dokter urologi, melengkapi dan mengembalikan kuesioner. Tiga puluh delapan dokter urologi bekerja di Rumah Sakit yang tersedia mesin urodinamika, yang lain merujuk kasus urodinamika ke tempat lain. Sebagian besar dokter urologi memesan urodinamika untuk pasien LUTS dengan defisit neurologi (84.3%) dan anal sphincter tone/bulbocavernosusreflex lemah (62.0%). Pada kasus OAB, urodinamika digunakan pada kasus dengan kegagalan terapi medis (70.4%) dan defisit neurologi (68.5%). Dua dari kriteria indikasi yang diterapkan pada kasus SUI adalah kegagalan terapi konservatif (70.4%) dan kasus inkontinensia campuran (SUI dengan OAB) (60.2%). Defisit Neurologis (66.7%) dan inkontinensia urine (26.9%) adalah indikasi urodinamika yang paling sering diterapkan untuk anak-anak. **Simpulan:** Kami menjelaskan pola kegunaan urodinamika diantara dokter urologi Indonesia. Ketersediaan mesin urodinamika, kemampuan ekonomi pasien, panduan urodinamika yang tersedia dapat menjadi faktor yang mempengaruhi pola ini.

**Kata kunci:** Filling cystometry, pressure flow study, diagnosis, pola penggunaan.

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## INTRODUCTION

Lower tract urinary symptoms (LUTS) may represent many conditions such as benign prostatic

enlargement, overactive bladder, nocturnal polyuria, detrusor underactivity, neurogenic bladder dysfunction, urinary tract infection, foreign body in the bladder, prostatitis, urethral stricture, bladder

tumor, and many more.<sup>1</sup> Similar to LUTS, urinary retention can also be caused by those various disorders.<sup>1</sup>

Urinary incontinence is defined by International Continence Society as 'the complaint of any involuntary loss of urine that is a social or hygiene problem'.<sup>2</sup> Prevalence of stress urinary incontinence (SUI) in female aged 15–64 years is 20–40% in four European countries.<sup>3</sup> Same as urinary incontinence, overactive bladder (OAB) syndrome also give a considerable effect on quality of life of the patients. OAB is the presence of urinary urgency, usually with frequency and nocturia, in the absence of other causes of similar symptoms.<sup>4</sup>

Urodynamic test is an important diagnostic tool in cases of LUTS, urinary incontinence, OAB, vesico-urethral dysfunction in children, and other functional urological cases. It is a series of dynamic tests to evaluate the function of lower urinary tract consisting storage and voiding process.<sup>5</sup> The main principle of this test is to reproduce patient's symptomatic complaints and to provide pathophysiological explanation by correlating the patient's symptoms with urodynamic findings.<sup>6,7</sup> Urodynamic tests consist of uroflowmetry, cystometry, ambulatory monitoring, urethral function and pad tests.<sup>8</sup>

In performing urodynamic test, it is important to evaluate patient history, patient physical examination and laboratorium finding. Knowledge on urodynamics, its indications and interpretation are important factors. Not all medical personnel, including Urologists who have access to urodynamic machine, perform urodynamic tests based on its indications according to available guidelines.

**Table 1.** Subject basic characteristics.

Age (years)	No of subjects	%	Type of hospital	No of subjects	%	Work duration (years)	No of subjects	%
30–39	51	47.2	Government + university	64	59.3	≤1	13	12.0
40–49	39	36.1	Government + non-university	16	14.8	1–5	30	27.8
50–59	12	11.1	Non-governmental + university	3	2.8	≥5	65	60.2
60–69	5	4.6	Non-governmental + non-university	25	23.1			
≥70	1	0.9						

**OBJECTIVE**

Aim of this study was to describe urodynamic utility pattern among Urologists in Indonesia especially in treating LUTS, urinary retention, OAB, SUI and urologic pediatric cases.

**MATERIAL & METHOD**

This was a cross sectional study. Subjects were Indonesian Urologists who attended urological scientific meeting or workshop in Jakarta between February until July 2014. They were given questionnaires consisted of subject characteristics (age, work duration, type of hospital, number of urodynamic cases per year), and urodynamic indication (when they would do or refer patients for urodynamic tests in cases of LUTS, urinary retention, OAB, SUI and urologic pediatric cases).

**RESULTS**

There were 108 subjects in this study out of 303 Urologists in Indonesia. Only 38 subjects (35.2%) worked at hospitals where urodynamic machines are available. Ninety six subjects (88.9%) always performed urinalysis before urodynamic test. Eight Urologists (7.4%) never performed or referred patients for urodynamic test, 54 (50%) referred 1 urodynamic test, 17 (15.7%) referred 2 urodynamic tests, 18 (16.7%) referred 3 urodynamic tests and 11 (10.2%) referred 4 urodynamic tests respectively each year.

In adult patients with LUTS (table 2), most of urologists considered urodynamic test if the patients had neurologic deficit (84.3%). Similar to

**Table 2.** Urodynamic indication in adults.

Indication	Cases							
	LUTS (in men)		Urinary Retention		OAB		SUI	
	Yes	%	Yes	%	Yes	%	Yes	%
Aged < 50 years	34	31.5	29	26.9				
Aged > 80 years	29	26.9	26	24.1				
Will undergo invasive therapy	5	4.6	3	2.8	35	32.4	45	41.7
Failed medical/conservative therapy	46	42.6			76	70.4	76	70.4
Symptoms occurred after invasive therapy	51	47.2	51	47.2	49	45.4		
Neurologic deficit	91	84.3	92	85.2	74	68.5		
Postvoid residual urine > 300 cc	40	37.0						
Bilateral hydronephrosis	14	13.0						
Weak anal sphincter tone/bulbocavernosus reflex	67	62.0	74	68.5				
Mixed incontinence (SUI + OAB)							65	60.2
Concomitant with SUI					54	50.0		
All cases with	4	3.7	1	0.9	15	13.9	21	19.4

**Table 3.** Urodynamic indication in children.

Indication	Answer	
	Yes	%
LUTS	7	6.5
Urinary retention	26	24.1
Enuresis	12	11.1
Neurologic deficit	72	66.7
Bilateral hydronephrosis	25	23.1
Urinary incontinence	29	26.9
Recurrent urinary tract infection	13	12.0

LUTS cases, urinary retention cases with neurologic deficit was the most cases to be referred for urodynamic test in adults (85.2%). A different situation with LUTS and urinary retention, failed conservative therapy was the most frequent indication for urodynamic test in OAB (70.4%) and SUI cases (70.4%).

In table 3, children with neurologic deficit was the most frequent indication for urodynamic test in pediatric cases (66.7%).

## DISCUSSION

Urodynamic test is a gold standard examination to diagnose bladder outlet obstruction (BOO) and to find the etiology of LUTS.<sup>9</sup> European Association of Urology in 2014 stated that urodynamic test was indicated for male patients who suffered LUTS with one or more of these criterias, such as unable to void more than 150 ml urine, aged < 50 years or > 80 years, post void residual urine

> 300 ml, have neurological disease, have undergone pelvic radical surgery, have previous unsuccessful (invasive) treatment for LUTS.<sup>10</sup>

In this study, there were 4 Urologists who recommended urodynamic test to all patients with LUTS. Commonly, male patients with chronic LUTS have primary bladder neck dysfunction (PBNB), voiding dysfunction, detrusor overactivity and detrusor underactivity.<sup>11,12</sup> Primary bladder neck dysfunction incidence rate in male patients with chronic LUTS was 40-50%.<sup>12</sup> Joeng et al study stated that PBNB incidence rate was 26%, while voiding dysfunction was 23.4%, detrusor underactivity was 12.7% and detrusor overactivity was 22.7% respectively in chronic LUTS cases.<sup>11</sup> Joeng recommended urodynamic test in chronic LUTS patients to make an accurate diagnose and give a proper treatment.<sup>11</sup> In this case, probably we should consider urodynamic test in chronic LUTS cases rather than only LUTS cases.<sup>11</sup>

Benign prostatic enlargement occurred in men older than 40 years and its prevalence in men older than 50 years was approximately 40%.<sup>1</sup> EAU guideline 2014 stated that men younger than 50 years with LUTS should undergo urodynamic test to look for lower urinary tract dysfunction etiology.<sup>10</sup> In our study, there was 68.5% subjects who never performed/ordered urodynamic test in male younger than 50 years with LUTS and 73.1% subjects who never performed urodynamic test in male older than 80 years with LUTS. This discrepancy could be due to factors such as patient economic capabilities, expensive urodynamic test cost and availability of

urodynamic test. At first, patients are treated and if the symptoms still persist, urodynamic test would be recommended. There are no guidelines on urodynamic indications for all males with LUTS who are going to have invasive therapy. In this study, only 4.6% subjects ordered urodynamic test with this indication criteria.

Men who suffered from neurological disorders often complain of micturition symptoms. Voiding disorders commonly found in men with neurologic disorders are detrusor overactivity, detrusor-sphincter dyssynergia and lost of detrusor contractility.<sup>6</sup> Those voiding disorders can be diagnosed with urodynamic test. In this study, most of the subjects recommended urodynamic test to their patients who suffered LUTS accompanied with neurological disorder.

In determining the need of urodynamic test for men who still suffer from LUTS after undergoing invasive therapy, failed drug treatment, have PVR >300 cc, have weak anal sphincter tone or bulbocavernosus reflex, subjects in this study had various answers. In our institute, we recommend urodynamic test to patients with these conditions.

There is no guidelines mentioning urodynamic indications in men with LUTS and bilateral hydronephrosis. Hence, most of Urologists in this study did not recommend urodynamic test for this condition. Voiding disorders with dilated upper urinary tract is a serious condition which should be diagnosed and treated accurately to avoid upper urinary tract damage. Urodynamic test indication in men with LUTS and bilateral hydronephrosis should be discussed in a proper forum.

In this study, urinary retention cases had a similar indication pattern with LUTS cases. This similarity could be caused by the similar pathophysiology underlying both conditions. There are few guidelines explaining urodynamic indication for OAB cases. Urodynamic test is not a compulsory examination in treating OAB.<sup>13</sup> Abrams<sup>6</sup> and Drake<sup>13</sup> recommended urodynamic test for OAB patients who failed conservative and medical treatment. This study showed that most of Urologists recommended urodynamic test for OAB cases with failure of conservative or medical treatment (70.4%) and with neurological disorders (68.5%). This result is already in line with available guidelines.

Urodynamic indication in patients with SUI is still controversial. Abrams recommended urodynamic test in women with of SUI or mixed

urinary incontinence who failed empirical treatment, and also in women with symptoms of frequency, urgency or recurrent urinary tract infections who failed empirical treatment.<sup>6</sup> Abrams and Lancu suggested urodynamic test in patients with SUI undergoing invasive treatment.<sup>6,14</sup> In this study, there were a few Urologists (19.4%) who indicated urodynamic tests in all patients with SUI. This could be caused by a challenge of SUI diagnosis through history taking and physical examination only. Only 41.7% of Urologists in this study recommended urodynamic test in patients with SUI who will undergo invasive treatment. Invasive treatment for SUI is still rarely performed in Indonesia. Indication of urodynamic test in mixed incontinence or SUI cases concomitant with OAB is still debatable. On the other hand, there was a large number (29.6%) of Urologists who did not recommend urodynamic test in patients with SUI who failed conservative treatment.

Abrams stated some urodynamic indications in children, such as neurological disorders with voiding dysfunction, enuresis or urinary incontinence that did not disappear with age, recurrent urinary tract infections, vesico-ureteric reflux (VUR) with dilated upper urinary tract and suspected 'urethral valves'.<sup>6</sup> Urodynamic test is recommended in children with neurological disorders and voiding dysfunction to determine whether the bladder is a high or low-pressure type which have different treatment principle.<sup>6</sup> Children with urethral valves often suffered from impaired bladder compliance and upper urinary tract dilatation and urodynamic test is recommended to evaluate bladder compliance.<sup>6</sup>

In this study, there were some Urologists (24.1%) who advocate urodynamic test in children with urinary retention, this could be due to the fact that urinary retention in children is a rare case and in need of an accurate diagnosis. Only a small portion of Urologists recommended urodynamic test in children with enuresis, urinary incontinence, recurrent urinary tract infections and bilateral hydronephrosis. Considering that enuresis or urinary incontinence is still normal in children and other more favorable examination such as as video-urodynamics or voiding cystogram could be the affecting factor from these results. Moreover, urodynamic test in children have different challenge in preparing its workplace and performing the procedure.

## CONCLUSION

Urodynamic utility pattern among Indonesian Urologists was various. However, most Indonesian Urologists have performed or ordered urodynamic studies based on its indication. Factors of this pattern could be patient economy capability, the availability of urodynamic test, the availability of voiding disorder treatment, and developing urodynamic guidelines. Further study and discussion in determining urodynamic indication is still needed. It is suggested that Indonesia Urologists should be more exposed with latest urodynamics guidelines.

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