

PATIENT PERCEPTION RELATED TO URODYNAMIC TESTING: A QUESTIONNAIRE BASED STUDY

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ABSTRACT

Objective: Urodynamic test is a series of test to evaluate the bladder function including voiding and storage physiology. Several previous studies have found that urodynamic testing had association with physical and emotional discomfort. The primary goal of this study was to determine the parameters of anxiety, pain, and shame related to urodynamic testing. **Material & Method:** From June 2014 to June 2015, a total of 57 consecutive patients who underwent urodynamic study were included in the present study, consisting of 20 men and 37 women. They have completed the questionnaire before and after urodynamic study. Patients were requested to answer four questions related to pain, embarrassment, anxiety, and knowledge related to urodynamic test. **Results:** Overall, most of the patients felt not at all and nearly not anxious before urodynamic study. Thirty percent of patient thought that there would be moderate pain when the urodynamic test is performed. Majority of patients (68% of patients) felt no embarrassment prior to the test. Overall, patients felt better after urodynamic study in terms of anxiety and pain. Parameter of embarrassment significantly increased after the test. Patient perception of anxiety and pain before urodynamic test are not significantly different with perception after urodynamic test. **Conclusion:** Urodynamic tests are very well tolerated by men and women. Majority of patients felt better after urodynamic test according to pain and anxiety score. No statistical difference in level of pain and anxiety between before and after the procedure, while parameter of embarrassment was significantly higher after the test was done.

Keywords: Anxiety, embarrassment, pain, urodynamic test.

ABSTRAK

Tujuan: Uji urodinamik merupakan serangkaian tes untuk mengevaluasi fungsi buli seperti fisiologi pengosongan dan penyimpanan. Beberapa studi sebelumnya menemukan bahwa uji urodinamik berhubungan dengan ketidaknyamanan secara fisik dan emosional. Tujuan utama penelitian ini adalah untuk menentukan parameter kecemasan, nyeri, dan malu berkaitan dengan uji urodinamik. **Bahan & Cara:** Dari Juni 2014 sampai Juni 2015, sebanyak 57 pasien yang menjalani studi urodinamik secara konsekutif disertakan dalam penelitian ini, terdiri atas 20 pria dan 37 wanita. Sampel mengisi kuisioner sebelum dan sesudah menjalani uji urodinamik. Pasien diminta menjawab empat pertanyaan berhubungan dengan rasa nyeri, malu, kecemasan, dan pengetahuan mengenai uji urodinamik. **Hasil:** Sebagian besar pasien tidak atau hampir tidak merasa cemas sebelum uji urodinamik. Tiga puluh persen pasien mengira akan merasa nyeri derajat sedang ketika dilakukan uji urodinamik. Sebagian besar pasien (68%) tidak merasa malu sebelum tes dilakukan. Secara keseluruhan, pasien merasa lebih baik setelah uji urodinamik berkaitan dengan kecemasan dan nyeri. Parameter rasa malu meningkat signifikan setelah tes dilakukan. Persepsi pasien mengenai kecemasan dan nyeri sebelum dan sesudah uji urodinamik tidak berbeda signifikan. **Simpulan:** Uji urodinamik dapat ditorelansi dengan baik oleh pria dan wanita. Sebagian besar pasien merasa lebih baik setelah uji urodinamik berkaitan dengan skor nyeri dan kecemasan. Tidak terdapat perbedaan secara statistik terhadap nyeri dan kecemasan antara sebelum dan sesudah prosedur, namun parameter rasa malu secara signifikan lebih tinggi setelah uji urodinamik dilakukan.

Kata kunci: Kecemasan, malu, nyeri, uji urodinamik.

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INTRODUCTION

Urodynamic test is a series of test to evaluate the bladder function including voiding and storage

physiology.¹ Urodynamic has two basic aims, first is to reproduce the patient's symptomatic complaints during urodynamic and second is to provide a pathophysiological explanation by correlating

patient's symptoms with the urodynamic findings. Despite its advantage this test has several limitations such as its invasiveness. The placement of urethral and rectal catheter, filling the bladder with fluid and voiding on demand in front of other people makes this test associated with discomfort. Investigation must be carried out in a safe and scientific manner. The operator is responsible for ensuring the privacy and comfort of patient because micturition is a private matter.² In addition, urodynamic test is associated with several complications including dysuria, urinary retention, hematuria and urinary tract infection.^{3,4} Proper care must be applied to the infection control aspect to ensure sterility of investigation.

Several previous studies found that urodynamic testing is associated with physical and emotional discomfort. Other studies were just limited in female patient,^{5,6} or patients without neurologic condition.^{7,8} Additionally, previous study did not obtain information about the association between patient perception before and after urodynamic study.^{4,8-10} Therefore, to address the problem, we designed a questionnaire-based study to all patients, including men and women who underwent a urodynamic study to assess patient perception (anxiety, pain, and shame) of the test.

OBJECTIVE

The objective of this study was to determine the parameters of anxiety, pain, and shame related to urodynamic testing.

MATERIAL & METHODS

Between June 2014 to June 2015, a total of 57 consecutive patients who underwent urodynamic study were included in the present study. There were 20 men and 37 women who completed the questionnaires. We excluded patients with previous history of urodynamic study, urinary tract infection, and patient with indwelling urethral catheters. The urodynamic was performed in Urology outpatient clinic, Cipto Mangunkusumo Hospital. Prior to urodynamic study, the patients were requested to answer four questions related to pain, embarrassment, anxiety, and knowledge related to urodynamic test. Patient was requested to describe their feeling about the test in terms of pain, anxiety and shame, in numerical scale from 1 that represented "not at all", 2 that represented "nearly

not", 3 that represented "moderate", 4 that represented "considerably" until 5 that represented "very much", respectively. The same questionnaire was given for the patients to fill out after urodynamic study. The addition of fifth question was added to the questionnaire after urodynamic to assess the patient's willingness to undergo urodynamic study again in the future.

A uroflowmetry study was performed before cystometry in all patients.^{1,2} Urodynamic investigation was performed by urology resident and nurse trained for urodynamic. All patients were examined for uroflowmetry and cystometry. Cystometry was conducted to measure the relationship of pressure and volume. Transurethral pressure transducers using catheter 8 Fr. was used to measure pressure during bladder filling. The pressure within the bladder was measured together with the pressure within the abdominal cavity (abdominal pressure was measured by the catheter placed in the rectum). The detrusor pressure was automatically calculated by subtracting bladder pressure and abdominal pressure. A technical report published by The International Continence Society (ICS) recommends that zero pressure be measured in the surrounding atmospheric pressure.¹¹ Before bladder filling, patients were asked to empty the bladder. Bladder was filled with physiologic saline 10-50 ml/min during cystometry. To ensure high quality recording, before and after patients were catheterized, bladder and rectal lines were flushed to ensure there was no bubbles and leaks. In addition, the tube was flushed once the catheter was connected to the transducers.

Descriptive analysis of patients was performed and presented using table. We evaluated the age, sex, marital status, educational level and clinical diagnosis as descriptive data of our study. We presented the patients responses on anxiety, embarrassment, and pain in the table. Wilcoxon test was used to determine the association between patient's response before and after urodynamic study test and pvalues less than 0.05 were considered significant. SPSS Statistics (from IBM) for Mac version 21.0.0.0 was used for statistical analysis.

RESULT

A total of 57 patients completed the questionnaires and were included in the analysis (table 1). Out of these patients, 65% of patients were females and 87% of patients were married. Forty

percent of patients had completed high school. Majority of patients (47% of patients) who underwent urodynamic study were diagnosed clinically with overactive bladder (OAB). Both of neurogenic bladder and stress incontinence were found in 23% of patients.

Values for self-reported physical and emotional distress prior to urodynamic testing are shown in table 2. Overall, most of the patients (76%)

Table 1. Characteristics of patients.

Variable	N
Age (mean)	49 (SD 2.0)
Sex	
Male	20 (35%)
Female	37 (65%)
Marital status	
Yes	50 (87%)
No	7 (12%)
Education level	
Below high school	3 (5%)
High school	28 (49%)
Collage	26 (46%)
Diagnosis	
OAB	27 (47%)
Neurogenic bladder	13 (23%)
Stress incontinence	13 (23%)
LUTS	2 (4%)
Other	2 (4%)

felt not at all and nearly not anxious before urodynamic study. There were 2 patients who felt very anxious prior to the test. Both anxious patients were married women, one had completed high school and the other had below high school educational level. Thirty percent of patients thought that there would be moderate pain related to urodynamic test and only one patient thought that it would be extremely painful to undergo urodynamic. The patient was female 53 years old with suspicious over active bladder, a housewife who finished high school. Majority of patients (78% of patients) felt not at all or nearly no shame before the test.

We found that most of the patients felt better after urodynamic study in the parameters of anxiety and pain compared to prior expectation. There were increasing number of patients who felt some embarrassment after the test. None of the patients felt that the test was worse in terms of anxiety, pain, and shame. Nearly one fourth of patients felt that the perception of anxiety, pain, and shame were the same as they had predicted before the test.

Table 3 illustrates the feeling of embarrassment from patients that had undergone urodynamic test, showing significant difference between before and after the test. Before the test, about 78% of patient felt 'not at all' or 'nearly not' embarrassed. Furthermore, parameter of embarrassment was increased after the test, leaving only 10% answering 'not at all'. In contrast, patient perceptions on anxiety and pain before and after urodynamic test were not significantly different ($p=0.801$ and $p=0.654$, respectively). Majority of the patients who felt no anxiety before the urodynamic also felt no anxiety after the procedure. Most of the

Table 2. Patient perception prior and after urodynamic test.

Parameters	Number of response value (%)				
	1	2	3	4	5
Prior urodynamic					
Anxiety	13 (22%)	30 (53%)	9 (16%)	3 (5%)	2 (4%)
Pain	8 (14%)	28 (49%)	17 (30%)	3 (5%)	1 (2%)
Shame	14 (25%)	30 (53%)	11 (19%)	2 (3%)	0 (%)
After urodynamic					
Anxiety	13 (23%)	29 (51%)	13 (23%)	2 (3%)	0 (0%)
Pain	10 (17%)	26 (46%)	19 (34%)	2 (3%)	0 (0%)
Shame	6 (10%)	34 (60%)	13 (23%)	4 (7%)	0 (0%)

Score 1 = not at all; 2 = nearly not; 3 = some; 4 = considerably; 5 = very much.

Table 3. Characteristics of patient embarrassment before and after urodynamic study.

		After urodynamic					Total	p value*
		1	2	3	4	5		
Before urodynamic	1	3 (5%)	9 (16%)	2 (4%)	0 (0%)	0 (0%)	14 (25%)	0.036
	2	3 (5%)	18 (32%)	8 (14%)	1 (2%)	0 (0%)	30 (53%)	
	3	0 (0%)	6 (10%)	3 (5%)	2 (3%)	0 (0%)	11 (19%)	
	4	0 (0%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)	2 (3%)	
	5	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
Total		6 (10%)	34 (60%)	13 (23%)	4 (7%)	0 (0%)	57 (100%)	

Score 1 = not at all; 2 = nearly not; 3 = some; 4 = considerably; 5 = very much.

Table 4. Characteristics of patient anxiety before and after urodynamic study.

		After urodynamic					Total	p value
		1	2	3	4	5		
Before urodynamic	1	5 (9%)	4 (7%)	4 (7%)	0 (0%)	0 (0%)	13 (23%)	0.801
	2	5 (9%)	18 (32%)	6 (10%)	1 (2%)	0 (0%)	30 (53%)	
	3	1 (2%)	5 (8%)	2 (4%)	1 (2%)	0 (0%)	9 (16%)	
	4	1 (2%)	2 (4%)	0 (0%)	0 (0%)	0 (0%)	3 (5%)	
	5	1 (2%)	0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	
Total		13 (24%)	29 (51%)	13 (23%)	2 (4%)	0 (0%)	57 (100%)	

Score 1 = not at all; 2 = nearly not; 3 = some; 4 = considerably; 5 = very much.

Table 5. Characteristics of patient pain before and after urodynamic study.

		After urodynamic					Total	p value
		1	2	3	4	5		
Before urodynamic	1	4 (7%)	3 (5%)	1 (2%)	0 (0%)	0 (0%)	8 (14%)	0.654
	2	5 (9%)	12 (21%)	10 (17%)	1 (2%)	0 (0%)	28 (49%)	
	3	0 (0%)	10 (18%)	6 (11%)	1 (2%)	0 (0%)	17 (30%)	
	4	0 (0%)	1 (2%)	2 (4%)	0 (0%)	0 (0%)	3 (5%)	
	5	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)	
Total		10 (18%)	26 (46%)	19 (34%)	2 (4%)	0 (0%)	57 (100%)	

Score 1 = not at all; 2 = nearly not; 3 = some; 4 = considerably; 5 = very much.

patients also thought that there would be no or nearly no pain before the test was performed, and majority of the patients also felt the same after the test (table 4 and table 5).

Before the study, majority of patients (35.1%) had moderate knowledge about the urodynamic study. After the test was performed, 87.7% of patients thought that information given about the test was clear enough. Most of the patients

(91.2% of patients) reported that they would undergo another urodynamic test in the future if the test was needed.

DISCUSSION

All of the subjects were from Urology outpatient clinic with various clinical diagnosis. Most of them were previously diagnosed with over

active bladder and neurogenic bladder. Physician needs some tools to evaluate the function of the bladder, especially the activity of the detrusor, the abdominal pressure and the relation with the function of the bladder itself. Urodynamic study provides information about filling and voiding phase of the bladder such as bladder capacity, pressure during filling, any overactivity of the detrusor, any incontinence, the peak flow while voiding, the voided volume and the residual urine volume in the bladder after voiding. By obtaining those information, physician will have a more detailed evaluation of the patient.

As a diagnostic study, urodynamic is an invasive study compared to other diagnostic modality such as ultrasonography or uroflowmetry. Its invasiveness is due to insertion of urethral and rectal catheter. Privacy is another limitation of the test because patient has to urinate in the presence of medical personnel.

Our study has found that our patients were not anxious prior to the urodynamic study. Majority of the patients felt low level of pain, anxiety and embarrassments before the urodynamic test. This may have been influenced by the clear explanation given by the medical personnel prior to the test. However, we have found significantly higher perception of embarrassment after the test compared to before. This may be influenced by lack of privacy during the test, which might cause feeling of embarrassment after the test. Levels of anxiety and pain however, were not reported to increase after the test, and was not significantly different between before and after the test.

Yokoyama et al, reported mean degrees of pain, embarrassment, and physical burden of 2.27/10, 2.59/10, and 1.76/10 from scale 1-10, score 1 represented as no at all and score 10 represented as unbearable, respectively.¹² Another study reported that mean pain level measured by VAS (Visual Analogue Score) of urethral procedure during urodynamic study was 4.4 from the scale of 1 as no pain at all and 10 as extreme pain.⁹ In our study, level of pain during urodynamic study was well tolerated with 97% of patients felt low or moderate pain. The values of pain in our study were evaluated in a different way with previous studies. This might explain the differences of the result. Most of the previous studies evaluated the pain using VAS score but in our study the pain perception was evaluated by a questionnaire, which was filled prior and after the test. We used scale 1 to 5 to measure the pain, score 1

represented 'no pain at all' and score 5 represented 'extreme pain'. The origin of pain in urodynamic study is multifactorial. In previous study, pain sensation was strongly associated with level of embarrassment and apprehension during the procedure.⁴

Ku et al, found no statistically significant association between pain score and gender.⁷ Women with previous history of chronic pain reported higher level of pain during the test. Patients with history of painful bladder syndrome might have heightened of sensory awareness of bladder filling.⁶ Younger age tends to feel more pain during the test. A possible mechanism for this phenomenon could be that mature subject might have undergone more medical procedures.⁵ In addition, history of overactive bladder with urgency during bladder filling causes patient to report significant greater pain during the test.⁶

Ku et al, found that pain scores were correlated with the pre-procedure anxiety scores. Different result was found in our study. There were 2 patients in our study with pre procedure anxiety score 5. Both were women, age 20 and 41 years old. One was diagnosed clinically as over active bladder which is a risk factor for pain during the test.⁷ The first patient was a housewife diagnosed with neurogenic bladder without history of obstetric surgery, and diabetes mellitus with history of 4 times normal delivery. The patient had pain score 5 but after the test, the pain score was decreased to 2. This is probably due to patient age which is quite young. Younger age tends to feel more pain.⁵ In contrast, the second patient pain score was 3 and after the test the score was 4. The patient was also a housewife diagnosed with over active bladder without history of obstetric surgery, diabetes mellitus, without history of delivery. This is probably due to the patient's diagnosis (OAB) which usually report significant greater pain during test.⁶

Our study has found that the urodynamic test was generally well tolerated by patients which is similar with previous studies.^{4,5,8} Yiu et al,⁴ performed a pre- and post study assessment of patient expectations of urodynamic test, and they found that 90% of patients thought that the test was the same or better than expected. However, studies from Yiu et al,⁴ and Greenstein et al,¹³ reported neither pre-procedural explanation for information nor clinical syndrome could influence level of pain. In those studies, association between providing information about urodynamic and the experience of

pain during the test was evaluated. Interestingly, the study found that information provided by the examining physician before the test did not lessen the anxiety, but rather heightened the anticipated pain level. The information from the doctors however, did not influence the expected pain levels of patients.

In a prospective cohort study performed by Yeung et al,⁶ patients were evaluated using VAS score to assess pain, anxiety, and embarrassment right after undergoing urodynamic testing and followed by another assessment one week after. The study reported low level of pain, anxiety, and embarrassment on visual analog scale after the test was completed and after one week of follow up. These findings support the findings of our study where there was no difference in levels of pain and anxiety before and after the procedure. However, there is a difference between the findings and Scarpero et al,⁸ where they investigated urodynamic test, using pre- and post- procedure questionnaires to evaluate embarrassment, anxiety and pain during video urodynamic testing. The authors found that subjects reported less pain, embarrassment and anxiety after the procedure when compared to pre-test scores. On the contrary, we found significantly higher scores of embarrassment after the procedure compared to before the procedure, although no difference in pain and anxiety parameters. This difference might be caused by different background in culture of our patients, compared to the patients in the Scarpero study which was done in Europe. Our study is the first study which evaluated Indonesian patients. Indonesian culture might influence the higher feeling of embarrassment during and after urodynamic test, as the procedure involved very private area of the patients.

In our study, there were only 2 patient whose embarrassment score was 4, both of them had pain score 4 and 3 before the test. Both of the patient were housewives diagnosed with neurogenic bladder without history of obstetric surgery and has finished high school. The pain score after the test was 2 for both patients.

Feeling of discomfort before urodynamic testing is associated with several factors. Previous study suggested that patient with high educational level felt less discomfort compared to patient with low educational level.¹⁰ Gender was not associated with anxiety and embarrassment. The perception of anxiety and embarrassment might be influenced by sex examiner's gender. Female patients might feel

more anxious and embarrassed when the test was performed by the male examiner and anxiety was associated with a greater level of pain.⁴

In this study we found that 74% of the patient were prepared for the test and understood the general idea of the procedure. This might have been caused by high educational level of the patients, which mostly were high school or higher. One thing that must be taken into account is that, information about the procedure had been given before and during the test by our medical personnel. Only 5% of the patients felt that the explanation was not useful in understanding the procedure. Previous findings by Yiou et al,⁴ suggested that effective intervention in reducing embarrassment and anxiety is by reassuring the patient before the actual invasive procedure was given.

Our study has some limitations. In this study, we did not evaluate risk factors for painful sensation, especially during the steps of the procedure. Previous studies have shown different level of pain during different steps of the procedure such as instillation of local anesthetic, catheter insertion, and catheter removal. In addition, we did not evaluate which factors might contribute to the feeling of embarrassment during the procedure. Lack of validated questionnaire to establish those symptoms during the survey became limitation of our study. Different measurement tools made comparison of our result with other studies difficult. We recommend a development of a questionnaire to assess the emotional and physical burden during the urodynamic test for future research.

CONCLUSION

Urodynamic test is very well tolerated by men and women in Cipto Mangunkusumo Hospital. The majority of patients felt better and much better after urodynamic test with regards to pain and anxiety parameters. There was no contrast variation in term of pain and anxiety value before and after the test. Level of embarrassment was statistically higher after the test. There was no difference between patient perceptions of anxiety and pain before and after urodynamic test.

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