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Research Article

The Effect of Duration of Stress Urinary Incontinence on developing Signs of Bladder Outlet Obstruction in Urodynamic Study

Saif AM. Abdul-Hameed[1], Salam Madhi Shahid[2], Ahmed Hameed Lafta Alsaadi[2], Harth Mohamed Kamber[3], Qais Abdulazziz Abdulmottaleb[4], Razzaq Hashim Mohammed[4], Wael Mohamed Kamber[5]

[1] Urology department, Nursing home hospital, Medical City Complex, Baghdad, Iraq
[2] Alkindy teaching hospital, Baghdad, Iraq
[3] Division of Urology, Department of Surgery, Al-Kindy College of Medicine, University of Baghdad, Baghdad, Iraq
[4] Almusayab health-care sector, Babylon Health Directerate, Ministry of health, Baghdad, Iraq
[5] Ministry of health headquarter, Baghdad, Iraq

* Corresponding author's email: harthkamber@kmc.uobaghdad.edu.iq

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ABSTRACT

Background: Stress urinary incontinence is a frequent urological disease in women; it has a great influence on an individual's wellbeing and places a significant economic strain on any health service. The placement of urodynamic diagnostic tests in the evaluation route is an important clinical research concern in this field.

Objective: to find out whether the duration of stress urinary incontinence is associated with the finding of bladder outlet obstruction in urodynamic study or not.

Subjects and Methods: A descriptive study. With enrolled female patients had symptomatic Stress urinary incontinence as their primary complain. All the included patients were assessed thoroughly by history taking and physical examination and relevant clinical tests and investigation in addition to urodynamic evaluation consisted of multi-channel urodynamics measuring abdominal, vesical and detrusor pressures simultaneously.

Results: 140 females were suffering from stress incontinence. Urodynamic study showed maximum urine flow rate (Q max) mean of (20.45±9.86) ml/second, the maximum post void volume was 500ml with 36.89ml was the mean of post void residual volume, and 90.83cm water was the mean of urethral occlusion pressure. The mean of duration have positive relationship with age category but without statically significant. Ninety-eight patients have Q max flow more than 25ml/sec with mean duration 6.04 without any statically significant (p=0.872). 37 patients were having >0 ml post void volume with mean duration more than other patients that didn't have post void volume but without statically significant (p=0.257). All patients with urethral pressure less than 120 cm had long duration mean than others but without statically significant (p=0.335). also, no statistical significance association between mean of duration and sphincter pelvic floor electromyogram (EMG).

Conclusion: there was no catechistically significant relationship between the urodynamic findings and the duration neither of stress urinary incontinence nor between the urodynamic findings and the age of the patients.

Introduction

Stress urinary incontinence (SUI) is a fairly common problem in women, with an estimated prevalence of 4 percent to 35 percent. [1] In Iraq the prevalence of SUI is estimated to be with in this range. [2] The observed range in incidence rates refers to differences in the communities analyzed, as well as discrepancies in the definition of SUI utilized by the researchers, since there is no standard defined definition of SUI for epidemiologic research. The formulation of a realistic and consistent definition of SUI has clinical and policy consequences. [3] This problem is thought to have a diverse origin. Furthermore, it is associated with a range of voiding difficulties. Increasing the management's difficulty and the resulting consequences Forecasting is more challenging. Finding the root of the problem as a result, difficulties with bladder and urethral function are widespread. A gathering of patients is of paramount importance in these circumstances, and rigorous assessment is of utmost importance. [4]

Urinary incontinence has a great influence on an individual 's wellbeing and places a significant economic strain on any health service. The placement of urodynamic diagnostic tests in the evaluation route is an important clinical research concern in this field. [5]

Urodynamics focuses on improving our knowledge of lower urinary tract function and identify the mechanism underlying the patient's symptoms. The information collected by urodynamics may corroborate or change the clinical diagnosis, which is based on medical records and physical examination, as well as impact the therapeutic decision. Urodynamics focuses on enhancing our know-how of decrease urinary tract feature and pick out the pathophysiology this is inflicting the patient's signs. The facts collected by means of urodynamics may additionally corroborate or trade the clinical diagnosis, that's primarily based on clinical records and bodily exam, as well as impact the healing choice. Many researchers tested several methods for the diagnosis of bladder outlet obstruction. Nevertheless, a pressure-flow study kept its position as one of the best methods to assess the presence and severity of bladder outlet obstruction (BOO). [6] Solomon et. al. developed a specific nomogram for the diagnosis of females BOO with a sensitivity reaching up to 93% and a specifity of up to 93%. [7]. However, many women consider urodynamics to be uncomfortable or embarrassing, and also time-consuming and expensive. Uurodynamics are linked to a 6–22% increase in the risk of urinary tract infections. [58,96] The most widely accepted theory suggests that anatomical and structural changes of the female vagina and pelvic floor play a major role in the development of SUI. The accentuation of such changes may lead to the development or accentuation of a more complex patterns of voiding dysfunctions including BOO. [10], Tthe aim of this study is to find out whether the duration of stress urinary incontinence is associated with the finding of bladder outlet obstruction in urodynamic study or not.

Subjects and Methods

A descriptive study with one hundred forty patients enrolled as a consecutive sample from the first of January 2021 to end of December 2021. We selected all female patients who had SUI as their chief complaint. Any female patient presenting with SUI attending to department of urology in Nursing Home Private Hospital in The Medical City Complex for management by specialist of urology and who that meeting the eligibility criteria and accepted to participate in study were included.

Any patients with end stage renal disease, with medication known to interfere with function of the bladder or sphincter, any root lesion of the sacral and lumbar outflow tracts and diseases related to peripheral neuropathy, bladder cancer, and current urolithiasis. And with previous genitourinary surgery, pelvic organ prolapse surgery were excluded

We included only females with either only SUI or who have SUI as their main symptom, who had failed medical and behavioral measures and were prepared for surgical intervention. A written consent was obtained from all the candidates. Stress incontinence was defined as "the complaint of involuntary loss of urine on effort or physical exertion (e.g., sporting activities), or on sneezing or coughing". [11]

We considered patients to have predominant SUI if they complained of both SUI and also uncontrolled passage of urine at the time of urgency with the SUI being the most bothersome symptom. We only included patient for whom SUI was confirmed either by physical examination or voiding diary or both. We examined all the patients by doing a cough stress test in the lithotomy position while the patient was reporting a full bladder. We measured the post-void residual volume by either catheterization or ultrasonography.

We developed a structured questionnaire to gather data from the patients. We took a detailed medical history and performed a thorough clinical examination to collect data that included (and not limited to): duration of symptoms, age, weight, height, obstetrical and gynecological history, and any significant medical or surgical condition. After that we did an ultrasonography of the abdomen to assess the status of the upper tracts, any other lesions in bladder. We requested and reviewed the bladder diaries wherever possiblefor all the candidates prior to urodynamic assessment. For all candidates, we did a urodynamic evaluation that consisted of multi-channel urodynamics measuring abdominal, vesical, and detrusor and urethral pressures simultaneously. All tests were carried out with Uromic Samba (MedKonsult Medical Technology/Czech Republic). The procedure was performed with slow filling water cystometry with a 9-Fr triple lumen UDS catheter, with patients keeping semi-supine without sedation and a rectal catheter was inserted into the anal to measure the abdominal pressure. The infusion rate of saline was 10% estimated bladder capacity (EBC) per minute. After this a voiding cystometry with the same simultaneous measurements was carried out. Solomon-Greenwell bladder outlet obstruction index was applied to define patients with BOO. A sterile urine culture was a mandatory pre-request before urodynamic assessment. All the urodynamic studies carried out by the same female operator supervised by the same specialist urologist

Statistical analysis

Collected data was formulated into an applicable form for analysis and SPSS (Statistical Package for Social Sciences) Ver. 23

was used for statistical analysis. Frequencies and percentages were used to describe categorical variable. The association between categorical variables was tested using independed T Chi-square test. whereas continuous variables presented as median with interquartile rangemean and standard deviation and compared using analysis of variance. With considered P. Value of ≤ 0.05 was statistically significant.

Results

The total study sample was 140 females with mean age of 50.81±12.78 years. All cases were suffering from stress incontinence with a duration that differs from one to another with a mean duration of 5.99 ±6.156 years. The result of urodynamic study showed Q max flow rate mean (20.45±9.86) ml/second, the maximum post void volume was 500ml with 36.89ml the mean of post void volume, 90.83cm water the mean of urethral pressure as shown in table 1. The result of study showed 46% of total were have a sign of BOO. As showed in figure 2.

More than half of the participants have normal sphincter electromyogram (EMG)_as shown in figure 1.

The result of study found the mean of duration Positive relationship with age category but without statically significant as showed in table 2.

Regarding to relation between duration of disease and maximal flow rate, we found that 98 patients have max flow rate more than 25ml/sec with mean duration 6.04 without any statically significant relationship (p=0.872). 37 patients were having >0 ml post void volume with mean duration more than other patients that didn't have post void volume but without statically significant (p=0.257). the result showed all patients with urethral pressure less than 120 cm were have long duration mean than others but without statical significance (p=0.335). Also, there was no statistically significant association between the mean duration and sphincter EMG. as shown in table 3.

The 65 patients who have signs of BOO have longer duration than the 75 patients who didn't have a sign of BOO but the difference was not significance statistically (p=0.663). as shown in table 4.

Table 1: distribution of study sample according age and urodynamic finding

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Age (years)	**140**	**25**	**83**	**50.81**	**12.786**
Maximum flow rate (ml/sec.)	140	3	56	20.45	9.861
Duration (years)	140	1	39	5.99	6.156
post void volume (ml)	140	0	500	36.89	84.218
urethral pressure (cm H_2O)	140	14	174	90.83	32.314

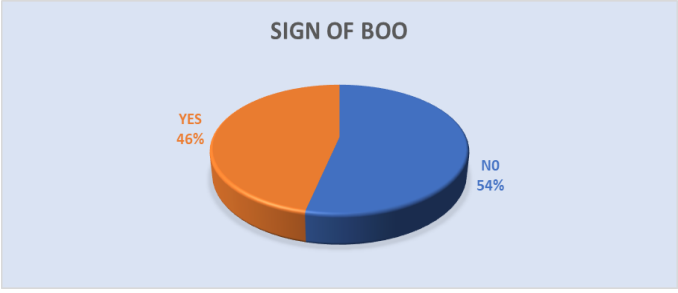

Figure 1: pie chart showed percent of patients with signs of BOO

Table 2: the relation between mean of duration and age category

Age category	N	Mean duration (years)	Std. Deviation	P value*
25-45years	51	4.65	3.571	
46-65years	67	6.4	7.093	0.096
>65years	22	7.82	7.346	
Total	140	5.99	6.156	

* P value<0.05 is statically significant
**One-way ANOVA test

Table 3: relationship between duration and urodynamic finding

Q MAX FLOW	N	Mean of duration(years)	Std. Deviation	P value*
>25ml/sec	42	5.86	6.307	0.872
<25ml/sec	98	6.04	6.122	
Post void volume				
>0ml/s	37	6.97	7.347	0.257
0ml/s	103	5.63	5.667	
Urethral pressure				
>120cm	29	5	4.48	0.335
<120cm	111	6.24	6.516	
sphincter EMG				
normal	74	5.96	6.24	0.958
abnormal	66	6.02	6.108	
Independent T test		* P value<0.05 is statically significant		

Table 4: the relation between mean of duration and sign of BOO

sign of BOO	N	Mean of duration (years)	Std. Deviation	P value*
yes	65	6.23	6.257	0.663
no	75	5.77	6.102	
In depended T test		* P value<0.05 is statically significant		

Discussion

Stress urinary incontinence (SUI), is the most frequent kind of incontinence. Yamell et al. discovered a 45 percent prevalence of Urinary incontinence (UI) in women aged 18 and above (22 percent SUI type). [12] Urinary leakage produced by a rapid increase in intra-abdominal pressure, e.g., owing to physical stress, coughing, bending, or moving heavy things, without evidence of bladder contractions and/or an unstable urethra, is known as SUI. Sphincter dysfunction and a poor transfer of intra-abdominal pressure to the proximal urethra, both of which are induced by an inadequate pelvic floor support, appear to be the most essential elements in the etiology of SUI. [13].

Urinary incontinence is fairly common among young adult females (20-30%). Its prevalence is higher in middle aged females (30-40%) and increases as the age increase (30-50% among elderly). [14].

Luber KM. found that the prevalence of SUI ranges from 4% to 35%. |The large variation in the reported prevalence is owed to the fact that no epidemiologic definition is agreed on like the agreement on the clinical definition. [15] .

According to Hunskar et al. 35% of the females aged more than 18 years involed in a large serveysurvey involved 17080 females from four European countries reported some sort of urinary incontinence. Among these SUI was the most common form of incontinence. [14] According to data published by Bidzan M.et. al., 35% of the patients older than 45 years admitted to the words or attending the outpatient clinics of the gynecology and urology departments reported SUI . [16] In our results the highest prevalence of SUI was in the females aged 46-65years (47.9%), and the second highest prevalence was(36.4%) at the age range of 25-45years. The prevalence of female SUI in our study increases with the increment of disease duration without statically significant association.

Aging, smoking, and obesity were found to increase the risk of SUI. Other probable risk factors include childbearing and delivery. [17] Stothers L. et. al. clarify that genetic predisposition, pregnancy, history of hysterectomy, and menopause can increase the risk of urinary incontinence. [18] The prevalence of SUI among 2875 female surveyed in the United States was 23.7%. I this sample of women the peak prevalence was among women in their fifth decade. This survey also confirmed the positive association between UI and age of the participants, their weight, and their ethnicity. [19]

According to a paper published by Opera J. et al. the prevalence of SUI was greater among females aged between 41 and 55 years as compared to those aged between 25 and 40 years. [20]

Its noteworthy that many patients complaining of UI does not report that complain or ask for medical help as noticed by Keyock and Newman. This should alert the population for the role of well-trained professional nurses in detection of this condition. [21]

Urodynamic study and voiding diaries are so far the most trustable and the most common tests that are used to assess the bladder function and sensation.

The aim of this study was to analyze the urodynamic findings of females with SUI and compare the findings in lights of the duration of complaint and the age of the patients.

The patients with the highest maximal urine flow rates had lower duration of SUI (5.86 ± 6.03), while the patients with the highest post voiding residual volumes had longer duration of SUI (6.97±7.34). The patients with higher urethral pressures had shorter duration of SUI (5±4.48). Also, all the participants with abnormal sphincter EMG had longer duration of SUI without any significant statistical association with any one of the above-mentioned findings.

Conclusion

There was no statistically significant relationship between the urodynamic findings and the duration neither of stress urinary incontinence nor between the urodynamic findings and the age of the patients.

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This research did not receive any specific fund.

Conflict of Interest

Authors declare no conflict of interest.

Data availability

Data are available upon reasonable request.

ORCID

Harth Kamber 0000-0001-9786-4873

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