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ASSESSMENT OF URODYNAMIC STUDY FINDINGS IN ELDERLY MALES PRESENTING WITH LUTS - A SINGLE CENTRE PROSPECTIVE STUDY

Urology

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ABSTRACT

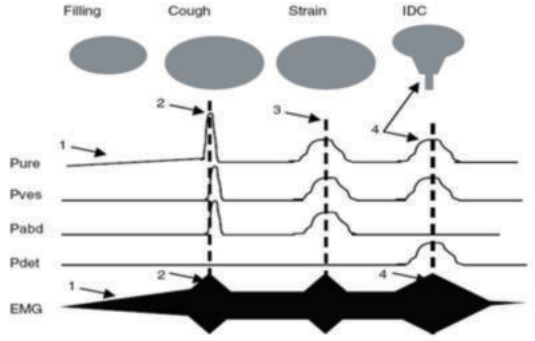
Lower urinary tract symptoms (LUTS) is a urological manifestation which increases with age significantly affecting the quality of life.They need proper evaluation and management and most important is to differentiate between the various etiology so that the management should be specific, ease for the patient, noninvasive and minimally invasive.The aim of this study is to evaluate the clinical and urodynamic findings of elderly patients with LUTS to search for accurate diagnosis and effective management. **Material And Methods:** The study population included 100 consecutive men with age more than 50 years with history indicative of lower urinary tract symptoms.The exclusion criteria included men under the age of 50 with symptoms and all female cases. The patients were divided into irritative and obstructive symptom groups based on their chief complaints and we're subjected to urodynamic evaluation. During bladder filling, bladder sensation,detrusor activity, bladder compliance, bladder capacity and leak point pressure are assessed.During voiding,the voided volume, maximum flowrate(Q max),the average flow rate, the maximum p det(max pdet),the p det on maximum flow are recorded.Analysis of these parameters are done. The Student t test was used to compare the irritative and obstructive LUTS groups,and the Chisquare test is used to analyse the urodynamic parameters. **Results:** The study found that out of the 100 patients evaluated, 60 presented with irritative LUTS and 40 presented with obstructive LUTS. The mean value of maximum flow rate (Q max) was lower in the irritative group than in the obstructive group. The mean value of bladder capacity was also lower in the irritative group than in the obstructive group. The detrusor pressure during the filling phase was higher in the irritative group than in the obstructive group. Detrusor overactivity (DO) was observed in 46 patients, while bladder outlet obstruction (BOO) was observed in 43 patients. Some cases presented with both DO and detrusor underactivity (DU). The study also found that the 24-hour frequency mean was higher in patients with DO than in those without DO. The 24-hour urine output was correlated with detrusor overactivity.

KEYWORDS

Lower Urinary Tract Symptoms(LUTS), Urodynamics, Irritative LUTS, Obstructive LUTS

INTRODUCTION

LUTS is a common urological manifestation that significantly affects quality of life, with urinary incontinence being the most troublesome symptom. The first step in evaluating older patients with LUTS is to assess their general medical condition and higher functions, including neurological examination and past urological procedures. Physical examination is also important to evaluate the cause of urinary dysfunction and any co-morbidities. Urodynamic evaluation, which includes recording vesical and abdominal pressures while filling and uroflow during voiding phase, is necessary to diagnose LUTS and differentiate between bladder outlet obstruction (BOO), detrusor overactivity (DO), and detrusor underactivity (DU). It is important to note that the approach to urodynamics may differ for elderly patients with less life expectancy compared to younger patients. For example, if an elderly man fails to respond to medical treatment for urge incontinence that persists after surgical removal of prostate, confirming DO as the cause may not be useful as he may not be fit for ileocystoplasty. However, this may not be the case for a younger patient.



NORMAL (1) relaxation of the striated muscles of the sphincter (EMG silence), (2) fall in urethral pressure, (3) rise in detrusor pressure, (4) opening of the urethra, and (5) uroflow.

MATERIAL AND METHODS

This was a prospective case control study done in a tertiary care hospital in Chennai from June 2021 to December 2022 Included all male patients of age older than 50 years with LUTS,with or without urinary retention and with or without co morbid illness. Men with age less than 50 years with symptoms and all female cases were excluded.

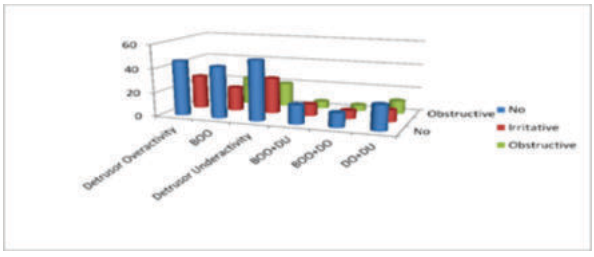
Our study population included 100 consecutive men with age more than 50 years with history indicative of lower urinary tract symptoms.Informed consent was obtained from each patient prior to participation in this study. All patients were interviewed in order to obtain detailed personal and medical histories. The patients were divided into irritative and obstructive symptom groups according to their chief complaints.Irritative symptoms are urinary frequency, nocturia urgency and/or urge incontinence; obstructive symptoms included straining,weak stream, intermittency and incomplete emptying. All details were recorded as per the proforma(Appendix). All patients were required to complete 24-hourvoiding diary and pad test for 3-day frequency volume chart in order to document urinary volume, incontinence and urgency episodes, and daytime and nighttime frequencies. International Prostate Symptom Score (I-PSS) has been calculated for the cases.Urinalysis, urine culture, noninvasive free flow uroflowmetry, post-void residual urine volumemeasurement were performed.All patients are subjected to Urodynamic evaluation using Aymed UDE Locum Wireless System v. 0.2.34 machine. Laxative was given on night before study.Patient is preparation on day of procedure. Patient is confirmed to have culture free and was started on antibiotics before procedure. Prior to catheterization and initiation of UDE,patient is asked to void. The UDE machine is primed every time before using it. We used a single urinary catheter of size 6 Fr ,which has two channels, one for themeasurement of p ves and the other for bladder filling. The catheter is fixed after insertion.The rectal catheter 6 F is introduced, using lubricant,through the anus so that the tip is positioned 10 cm to 15 cm above the anal verge. Filling cystometry was done at a rate of 25-40 ml. per minute usingnormal saline at room temperature with the patient reclining.Voiding is also done in the same position once capacity is achieved.During bladder filling, bladder sensation(first sensation of filling,normal desire to void, strong desire to void, urgency or pain) detrusor activity, bladder compliance, bladder capacity and leak point pressure are assessed.During voiding,the voided volume, maximum flow rate(Q max),the average flow rate, the maximum p det(max pdet),the p det on maximum flow are recorded.Analysis of the above parameters are done.

STATISTICAL ANALYSIS & RESULTS

The Student t test was used to compare the irritative and obstructive

LUTS groups,and the Chisquare test is used to analyse the urodynamic parameters. p-values < 0.05 were considered statistically significant.

Out of the total 100 patients evaluated, 60 patients presented with irritative LUTS and 40 patients presented with obstructive LUTS.The maximum age group falls under 70-75 category. The mean age in Irritative group is 68.2 while on obstructive group is 71.9.Overall mean age is 70.8 on analysis. p value is 0.67 which is not statistically significant.IPSS score showed mean score of 24.5 in irritative LUTS group whereas 21.2 in obstructive LUTS group and the overall mean score being 23.4. p value is 0.14 which is not statistically significant.The mean value of maximum flow rate (Q max) is 16.5 in irritative LUTS group whereas 8.4 in case of obstructive LUTS. Overall mean Q max being 13.2. p value is 0.03 which is statistically significant.



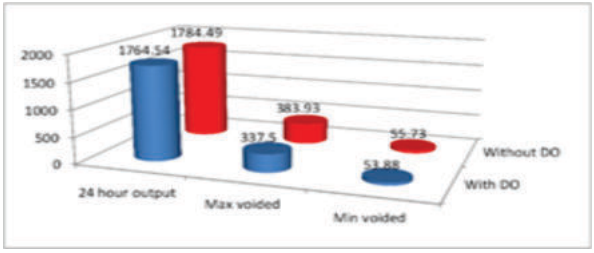
The mean value of bladder capacity is 320.8 ml in irritative LUTS group whereas 364.6 ml in case of obstructive LUTS group.Overall mean bladder capacity being 341.7 ml. p value is 0.34 which is not statistically significant.The mean value of PVR is 68.4 ml in irritative LUTS group whereas 84.5ml in case of obstructive LUTS group. Overall mean PVR being 78.4 ml. p value is 0.24 which is not statistically significant.

The mean value of p det Qmax is 31.9 cm H2O in irritative LUTS group whereas it is 30.1 cm H2O in case of obstructive LUTS group. Overall mean p det Qmax being 31.2 cm H2O.The p value is 0.34 which is not statistically significant.

Detrusor overactivity(DO) has been observed that 46 patients .Among them,18 patients belongs to the obstructive group and 28 patients are from irritative LUTS group.It has been observed that 43 patients showed BOO. Among them, 23 patients belongs to the obstructive group and 20 patients are from irritative LUTS group.Many cases presented with bladder outlet obstruction (BOO) and DO. It has been observed that 12 patients showed BOO+DO. Among them, 5 patients belongs to the obstructive group and 7 patients are from irritative LUTS group.

S NO	UDE parameter	No	Irritative	Obstructive
1	Detrusor Overactivity	46	28	18
2	BOO	43	20	23
3	Detrusor Underactivity	50	30	20
4	BOO+DU	16	10	6
5	BOO+DO	12	7	5
6	DO+DU	21	10	11

It has been observed that 50 patients showed DU.Among them, 20 patients belongs to the obstructive group and 30 patients are from irritative LUTS group.Many cases presented with bladder outlet obstruction (BOO) and DU. It has been observed that 16 patients showed BOO+DU. Among them, 6 patients belongs to the obstructive group and 10 patients are from irritative LUTS group. Some cases presented with detrusor overactity(DO) and DU. It is observed that 21 patients showed DO+DU. Among them, 11 patients belongs to the obstructive group and 10 patients are from irritative LUTS group.



The mean 24 hour urine output of those with DO is a 1764.54 ml and those without DO is 1784.49 ml; p value being 0.82,the mean amount of maximum output in those with DO is 337.5 ml and those without DO is 383.93 ml ;p value being 0.27,the mean amount of minimum output in patients with DO is 3.88 ml and without DO is 55.73 ml ;p value being 0.428 which is not statistically

Variables	With DO	Without DO	P value
24 hour frequency(mean)	11.26	11.01	0.613
24 hour production(mean)	1764.54	1784.49	0.82
Maximum voided volume(mean)	337.5	383.93	0.207
Minimum voided volume (mean)	53.88	55.73	0.428

DISCUSSION

The study found that LUTS affects up to 80% of elderly men and is complex and multifactorial. The main complaint of many patients is a weak stream. The study recorded various aging changes, including a decrease in Q max (maximum flow rate), an increase in PVR volume (post-void residual volume), a decline in bladder capacity, and a decline in bladder compliance. The mean bladder capacity was found to be 341.7 ml, the mean PVR was 78.4 ml, and the mean Q max was 13.2. Detrusor pressure was also measured, and it was found that 46 patients showed detrusor overactivity (DO), with 18 patients belonging to the obstructive group and 28 patients from the irritative LUTS group. The study also noted that patients complained mainly of irritative and obstructive symptoms.In our study, detrusor dysfunction was detected in 75%.Fifty patients showed demonstrable evidence of DU of whom 21 had concomitant DO, while 16 had concomitant bladder outlet obstruction (BOO). BOO and DO was identified in 43 and 46 ppatient respectively. Bladder outlet obstruction was the most common uurodynamic finding, occtirring in around 70% of the study population.Nearly half of the patients with obstruction also had idiopathic detrusor over activity . In this study 43% of the patients had bladder outlet obstruction, of whom 12% had concomitant detrusor overactivity.

CONCLUSION

This study supports the use of urodynamic study in the evaluation of elderly men more than 50 years old presenting with LUTS.

A significant proportion of elderly patients was found to have urodynamic abnormalities such as detrusor overactivity(DO)or detrusor under activity (DU) or bladder outlet obstruction(BOO) and additionally,the urodynamic abnormalities are widely differing, reflecting the variation in underlying etiologies.

Detrusor overactivity in patients with LUTS significantly affects their symptom score and perception of quality of life. Moreover, it is strongly affected by the degree of obstruction on uroflowmetry, post-void residual urine estimation as assessed by pressure flow study.

So urodynamic study plays an important role in establishing a correct diagnosis in elderly patients with LUTS and deciding on additional treatments.

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