ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Correlation between Uroflowmetry Variables and Lower Urinary Tract Symptoms in Young Males at A Rural General Hospital.

Pratik Dattatraya Bamane[1]*, Sachin Naik[2], Rohan Valsangkar[3], and Kadambari Subhash Borade[4].

[1]Junior Resident, Department of General Surgery MIMER Medical College, Pune, Maharashtra, India.
[2]Prof.and Head, Department of general Surgery, MIMER Medical College, Pune, Maharashtra, India.
[3]Consultant Urologist, Department of General Surgery, MIMER Medical College, Pune, Maharashtra, India.
[4]Junior Resident, Department of General Surgery, MIMER Medical College, Pune, Maharashtra, India.

ABSTRACT

Urinary symptoms are a common complaint among men, and they can negatively affect their quality of life. Lower urinary tract symptoms (LUTS) refer to a set of symptoms that indicate problems in the bladder, prostate, and urethra. This study aimed to investigate the correlation between uroflowmetry variables and lower urinary tract symptoms (LUTS) in young males in a rural general hospital setting. The study was a descriptive observational, single-center study conducted in the Department of General Surgery at a tertiary care rural hospital. The study population consisted of male patients aged between 18 and 40 years with LUTS. Uroflowmetry was performed on each participant, and the data was analyzed to assess the correlation between uroflowmetry variables and LUTS symptoms. A total of 48 patients participated in the study, and the results showed that 50% of the patients had a maximum flow rate (Qmax) of less than 15ml/s. Additionally, 52.08% of the patients had an obstructive pattern curve on uroflowmetry, while 47.91% had an irritative/restrictive (non-obstructive) pattern curve. The severity of LUTS was evaluated using the International Prostate Symptom Score (IPSS), and the results showed that 45.83% of the patients had mild LUTS, 41.66% had moderate LUTS, and 12.5% had severe LUTS. Understanding the correlation between uroflowmetry variables and LUTS in this population can provide valuable insights into the diagnosis and management of LUTS in young males in rural areas. There was statistically significant correlation between IPSS and the other variables of uroflowmetry. Clinically, Qmax remains the only important parameter in uroflowmetry. Severity of LUTS by IPPS has correlation with the maximum flow rate (Q max)

Keywords: Uroflowmetry Variables, Lower Urinary Tract

https://doi.org/10.33887/rjpbcs/2023.14.3.17

Corresponding author

ISSN: 0975-8585

INTRODUCTION

Urinary symptoms are a common complaint among men, and they can negatively affect their quality of life. Lower urinary tract symptoms (LUTS) refer to a set of symptoms that indicate problems in the bladder, prostate, and urethra [1-3]. These symptoms include urgency, frequency, nocturia, weak stream, and difficulty starting or stopping urination. Uroflowmetry is a noninvasive test that measures the rate of urine flow during urination. Uroflowmetry variables such as peak flow rate, average flow rate, and voided volume can provide valuable information about the urinary system's function. Uroflowmetry is widely used as an initial evaluation tool in men with LUTS. Lower urinary tract symptoms (LUTS) are a non-specific term and refer to those symptoms that result from conditions and diseases affecting the bladder and the urethra. According to international consensus conference LUTS is defined as symptoms related to storage and/or voiding disturbances [4].

This study aims to investigate the correlation between uroflowmetry variables and LUTS in young males in a rural general hospital setting. The rural population is known to have a higher incidence of LUTS due to their lifestyle and dietary habits. Understanding the correlation between uroflowmetry variables and LUTS in this population can provide valuable insights into the diagnosis and management of LUTS in young males [5, 6].

MATERIAL AND METHODS

This study was a descriptive observational, single-center study conducted in the Department of General Surgery at a tertiary care rural hospital. The study aimed to investigate the correlation between uroflowmetry variables and LUTS in young males in a rural population. The study protocol was approved by the Institutional Ethics Committee (IEC), and written informed consent was obtained from all participants before recruitment into the study.

The study population consisted of male patients aged between 18 and 40 years with LUTS who were willing to sign the Informed Consent Document. Patients with known neurological cases of bladder dysfunction, previous history of surgery of urinary tract or pelvic surgery, history of trauma to the urinary tract or spinal cord, cerebrovascular accident, history of urethral stricture, urogenital malignancy, acute UTI, DM, vesical calculus, and those on medications that would affect uroflowmetry parameters were excluded from the study. Patients with a voided volume less than 150ml were also excluded.

The study was conducted over a period of 18 months from February 2021 to July 2022. Uroflowmetry was performed on each participant, and the data was analyzed to assess the correlation between uroflowmetry variables and LUTS symptoms. The following documents were obtained before initiating the study: study protocol, written informed consent document in English and in vernacular languages (Hindi and Marathi), case record forms, disease and drug awareness questionnaire in English, Hindi, and Marathi languages, and self-medication questionnaire in English, Hindi, and Marathi languages. The patients were fully explained about the benefits and risks of participation in the study, confidentiality, right to withdraw from the study, and no compensation for participation. All the information was explained to the patients in language and terms that they were able to understand. Each original consent document was signed, dated, and retained by the investigators, while a copy of the same was given to the patients. The study was conducted in compliance with the National Ethical Guidelines for Biomedical and Health Research Involving Human Participants issued by ICMR (Indian Council of Medical Research) and ICH Good Clinical Practice (GCP) guidelines.

A total of 48 patients who were having Lower urinary tract symptoms participated in the study. Mean age of the patients was 32.10 ± 6.75 years (Mean ± Standard Deviation).

The uroflowmetry parameters which are urine volume passed per unit time in millilitres per second (mL/s), maximum flow rate (Q_{max}) and total volume voided were measured for each participant. Along with this post void residual (PVR) urine was also measured for each participant.

RESULTS

In this study all 48 patients had voided volume of more than 150 ml. Maximum number of patients had voided volume between 250 ml – 450 ml.

ISSN: 0975-8585

Table 1: Voided Volume (ml) of participants

Voided Volume(ml)	Number of patients (n=48)	Percentage of patients (%)
150-250	9	18.75
251-350	13	27.08
351-450	13	27.08
451-550	8	16.66
551-650	1	2.08

Out of 48 patients with lower urinary tract symptoms, 24 (50%) patients have Qmax of less than 15ml/s while 24 (50%) had Qmax of more than 15ml/s. Mean Qmax is of 16.31ml/s. Out of 48 patients with lower urinary tract symptoms, 25 (52.08%) patients had obstructive pattern curve on uroflowmetry while 23 (47.91%) patients had irritative/Restrictive (Non-obstructive) pattern curve on uroflowmetry.

Table 2: Severity of LUTS by IPSS

Score	Severity	Number of patients (n=48)	Percentage of patients
1-7	Mild	22	45.83%
8-19	Moderate	20	41.66%
20-35	Severe	6	12.5%

Components of IPSS are incomplete emptying, frequency, intermittency, urgency, weak stream, straining and nocturia. Complete scoring system has been explained in methodology section. The results of severity of LUTS by IPSS has been explained in table 5.2. below. Out of 48 patients, 22 (45.83%) have mild severity (score between 1-7) while 20(41.66%) patients have moderate severity (score between 8-19) and 6(12.5%) patients have severe severity score between 20-35.

Out of 48 patients with lower urinary tract symptoms, 25 (52.08%) patients had obstructive LUTS.

Out of 48 patients with lower urinary tract symptoms, 23 (47.91%) patients hadirritative LUTS.

This is a descriptive observational, single-center study undertaken in a tertiary care center from February 2021 till July 2022 for finding out the correlation between uroflowmetry variables and lower urinary tract symptoms in young males.

DISCUSSION

A total of 48 patients were recruited in this study. Although it is known that LUTS has higher prevalence in older age group with a prevalence of 80% among the males above the age of 50 years but this study showed mean age of 32.10 years with a standard deviation of 6.75 years. The possible explanation was the inclusion criteria for this study included young males of age 18-40 years. But the evidence suggests that these lower urinary tract symptoms can occur in younger men without the abnormalities of the prostate. In such patients LUTS reflects other systemic disease process [4]. Another study done in USA suggests that young men experience LUTS at relatively high rates with approximately half of young men report LUTS [6, 7].

Maximum number of patients had voided volume between 250 ml — 450 ml and 50% patients had Qmax of less than 15ml/s. Qmax is important for distinguishing those who have BOO from those who do not. The following cut off values for Qmax are widely accepted:

- Rates greater than 20 mL/s indicate a low probability of BOO
- Rates between 15 mL/s and 20 mL/s indicate a low probability of BOO (butsymptomatic patients should be considered for urodynamic studies)

- Rates between 10 mL/s and 15 mL/s are equivocal
- Rates less than 10 mL/s are often the result of BOO or detrusor impairment(8)

In this study 21(43.75%) patients had bladder outlet obstruction which was defined as Qmax less than 15ml/s for voided volume of more than 150ml with a typical obstructive pattern on uroflowmetry curve.

The LUTS are a major burden for aging men, since it affects the quality of life significantly. Uroflowmetry specifically Qmax, can predict the natural history of the disease and also response to the surgery. Men with LUTS and normal Qmax is likely to have non BPH related cause for their symptoms [9].

Factors such as dynamic urethral resistance, prostate capsule, and anatomic pleomorphism rather than actual prostate size can influence severity of symptoms [10]. Many patients with LUTS-BPH will benefit from invasive procedures to remove the enlarged gland, some may not benefit from such treatments due to persistence of bothersome LUTS after surgery. It is therefore imperative that patients with LUTS be properly investigated and categorized based on the cause of LUTS. Objective symptom assessment using various symptom scoring systems, such as IPSS, uroflowmetry, and urodynamics, have proved very useful tools in the assessment of patients with LUTS-BPH before definitive treatment.

The severity of patients' symptoms is still an important factor in determining whether to perform a prostatectomy. The International Prostate Symptom Score (IPSS), which is identical to the AUA Symptom Index, is recommended as the symptom scoring instrument to be used for the baseline assessment of symptom 52 severity in men presenting with LUTS [11].

CONCLUSION

There was statistically significant correlation between IPSS and the other variables of uroflowmetry. Clinically, Qmax remains the only important parameter in uroflowmetry. Severity of LUTS by IPPS has correlation with the maximum flow rate (Q max).

REFERENCES

[1] Susset JG, Rabinovitch HH, Rosario F, Mackinnon KJ. Measurement of urethral resistance. J Urol. 1966;96(5):746–55.

[2] ROWAN D, MCKENZIE AL, MCNEE SG, GLEN ES. A Technical and Clinical Evaluation of The Disa Uroflowmeter. Br J Urol. 1977;49(4):285–91.

[3] CARDUS D, QUESADA EM, SCOTT FB. Use of an electromagnetic flowmeter for urine flow measurements. J Appl Physiol. 1963;18:845–7.

[4] Chairman Rowant D, James ED, Kramer AEJL, Sterling AM, Suhel PF. Urodynamic equipment: technical aspects. http://dx.doi.org/103109/03091908709062796. 2009;11(2):57–64.

[5] Schfer W, Abrams P, Liao L, Mattiasson A, Pesce F, Spangberg A, et al. Good urodynamic practices: Uroflowmetry, filling cystometry, and pressure-flow studies**. Neurourol Urodyn. 2002 Jan 1;21(3):261–74.

[6] Mathur R, Thakur K, Hazam RK. Highlights of indian council of medical research national ethical guidelines for biomedical and health research involving human participants. Indian J Pharmacol. 2019;51(3):214–21.

[7] E6(R2) Good Clinical Practice: Integrated Addendum to ICH E6(R1) | FDA [Internet]. [cited 2021 Nov 15]. Available from: https://www.fda.gov/regulatory- information/search-fda-guidance-documents/e6r2-good-clinical-practice- integrated-addendum-ich-e6r

[8] Beland L, Martin C, Han JS. Lower Urinary Tract Symptoms in Young Men— Causes and Management. Curr Urol Rep. 2022;23(2):29–37.

[9] George NJ. Clinical uroflowmetry. Diagnostic Tech Urol. 1990

[10] Kaplan SA, Te AE, Pressler LB, Olsson CA. Transition Zone Index as a Method of Assessing Benign Prostatic Hyperplasia: Correlation with Symptoms, Urine Flow and Detrusor Pressure. J Urol. 1995 Nov 1;154(5):1764–9.

[11] Vesely S, Knutson T, Damber JE, Dicuio M, Dahlstrand C. Relationship Between Age, Prostate Volume, Prostate-specific Antigen, Symptom Score and Uroflowmetry in Men with Lower Urinary Tract Symptoms.2009;37(4):322–8.