e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(5); 214-221

Original Research Article

Evaluation of Uroflowmetric Parameters in Patients of Benign Prostatic Hyperplasia before and after Transurethral Resection of the Prostate in a Tertiary Care Teaching Hospital of Rajasthan, India

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Received: 26-02-2023 / Revised: 24-03-2023 / Accepted: 20-04-2023

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Conflict of interest: Nil

Abstract

Introduction: Benign Prostatic Hyperplasia commonly known as BPH is a widespread disorder of men affecting mostly the elderly which further significantly affects the quality of life due to Lower Urinary Tract Symptoms.

Aim: The present study objective was to find out the role of uroflometry in Lower Urinary Tract Symptom evaluation due to BPH and to assess the Uroflowmetry findings before and after transurethral resection of prostate.

Materials and Methods: This prospective study was conducted from August 2021 to July 2022 at the study site. Eligibility criteria included patients over the age of 40 that reported experiencing lower urinary tract symptoms (LUTS) due to benign prostatic hyperplasia (BPH) and were advised for transurethral resection of the prostate (TURP). International Prostate Symptom Score (IPSS) was calculated and uroflowmetry data was obtained both before and after the procedure. A variety of statistical tests were conducted, such as chi-square, crosstabs, paired tests to gather the results.

Results: A total of 14 patients (or 40%) were between the ages of 61 and 70, and the mean (SD) age was 67.91 years. 31 (88.5%) patients had an IPSS score of >20 preoperatively, while none did so postoperatively. In the IPSS score 4 (11.4%) patients with values between 9 and 19, a substantial (p0.0001) improvement was seen.

Conclusion: Uroflowmetry can be used as a diagnostic technique that can serve as an accurate evaluation of the signs, symptoms, and outcomes associated with transurethral resection of the prostate (TURP). It can be a valuable tool in informing decisions related to treatment.

Keywords: Lower urinary tract symptoms, BPH, IPSS.

Introduction

Benign prostatic hyperplasia (BPH) is a non-cancerous enlargement of the prostate gland. It is very common, occurring in over half of men in their 60s and up to 90% of men in their 80s. Depending on the severity, symptoms may range from mild to severe, including a need to urinate frequently, a weak or intermittent stream of urine, painful urination, night time urination, and the feeling of incomplete bladder emptying.

Treatment options vary depending on severity, and can range from medication to surgical procedures. Patients often seek a treatment for their BPH symptoms that provides lasting relief and also minimizes side effects. In cases of extreme BPH, surgery can be used to provide definitive relief. In other cases, medications can be used to reduce prostate symptoms, shrink the gland, and slow the progression of BPH. Lifestyle changes such as increased fluid intake, the avoidance of alcohol and caffeine, regular exercise, and avoiding medications that increase urination can also help reduce the symptoms associated with BPH. The prevalence of lower urinary tract symptoms (LUTS) increases steadily up to 30% among patients older than 65 years.

These bothersome LUTS can significantly impact an individual's quality of life [1]. however, Aging is associated with an increase in lower urinary tract symptoms (LUTS). Data shows that the prevalence of LUTS rises between 50-79 years, 80-89 years, and >90 years. Specifically, these age cohorts have a respective incidence level of around 56%, 70%, and 90% [2].

TURP (transurethral resection of the prostate) is one of the most common approaches for treating BPH (benign prostatic hyperplasia). Several treatment modalities are used to manage BPH, and this surgical procedure remains a prominent method utilized in clinical practice.

Uroflowmetry is a popular non-invasive urodynamic test used to measure the maximum flow rate (Qmax) for a given volume of voided urine. It is particularly useful in the diagnosis of lower urinary tract symptoms (LUTS) due to bladder outlet obstruction, like BPH. When compared with other metrics, Qmax provides a more specific result for identifying patients with BPH than Qavg. Moreover, when combined with symptom scores, it further increases its accuracy in characterizing bladder obstruction. Notably, Qmax has been shown to have a better association with obstruction presence or absence than symptom reporting alone. This study aims to compare the efficacy of uroflowmetry in diagnosing and treating Lower Urinary Tract Symptoms associated with Benign Prostatic Hyperplasia, as well as investigating IPSS levels before and after Transurethral Resection of the Prostate. The findings show that uroflowmetry is an effective measurement tool for determining LUTS in BPH patients, as well assessing their response to TURP surgery [3].

The intensity of lower urinary tract symptoms can be determined using the International Prostate Symptom Score (IPSS). It is a verified, repeatable scoring system for evaluating the severity of the disease and the therapeutic response. The seven questions that make up the IPSS are all about voiding symptoms. Mild symptoms are represented by a score of 0 to 7, moderate symptoms by a score of 8 to 19, and severe symptoms by a score of 20 to 35 [4].

Materials and Methods

This was a prospective single centre study conducted between August 2021 to July 2022 at Department of Urology, National Institute

of Medical Sciences & Research, Jaipur (Rajasthan), India. This study included patients aged 40 and over who presented with lower urinary tract symptoms (LUTS) related to benign prostatic hyperplasia (BPH) and who were candidates for transurethral resection of the prostate (TURP). Patients aged around 40 were given medical therapy initially and those who failed response to therapy were considered for TURP and included in the study. Those with urethral stricture, bladder neck obstruction, catheterized patients, or those with acute urinary retention associated with an indwelling perurethral catheter and S PSA > 4 ng/dl were not eligible.

The study protocol and procedure adhered to the principles of the Declaration of Helsinki and all participants provided written informed consent prior to participating in the study. Participation had no impact on treatment.

Patient eligibility was determined after a comprehensive history and physical examination, including digital rectal examination of the prostate. Subsequent investigations included kidney and urinary tract imaging for prostate size (USG KUB with PVRU), blood chemistry tests, urinalysis, and S.PSA. Prior to procedure commencement all relevant parameters were recorded; namely patient age; IPSS score; average flow rate (Qavg); maximum flow rate (Qmax); Tmax. All variables were again assessed 14 days post-TURP.

Statistical Analysis

SPSS Statistical Software was used for the statistical study (version 23, IBM, Chicago). The following analysis methods were used: summary statistics, descriptive measures, tests of significance for difference between two means. At p value of <0.05, all results were deemed significant.

Results

This study covered and evaluated 35 patients in total. The age ranged from 51 to 80 years, with a mean of 67.9143 (7.97) years. (Figure 1) IPSS score was distributed as 9-19 for 4 (11.4%) patients pre operatively while it was for all 35 (100%) patients after the procedure was done. 31 (88.57%) patients had IPSS score of >20 pre operatively while none had this post operatively. The difference among this parameter of IPSS scoring was statistically different among the two groups. ($p<0.05$)While analysing the parameter of Qmax, all the patients 35 (100%) had a Qmax of <10 while post operatively the number changes to 10-15 for 11 (31.42%) patients and >15 for rest 24 (68.57%) patients respectively. (p value <0.05)Qavg was <10 for 2(5.7%) patients and 10-15 for 14 (40%) patients pre operatively while after the operation none reported to have Qavg of 10-15. The difference was statistically significant. ($p<0.05$) Tmax was 10-15 for majority of the patients 28 (80%) while the rest had >15 preoperatively. After the procedure was done Tmax was reported to be <10 among all the study participants. (Table: 1) (Figure: 1)

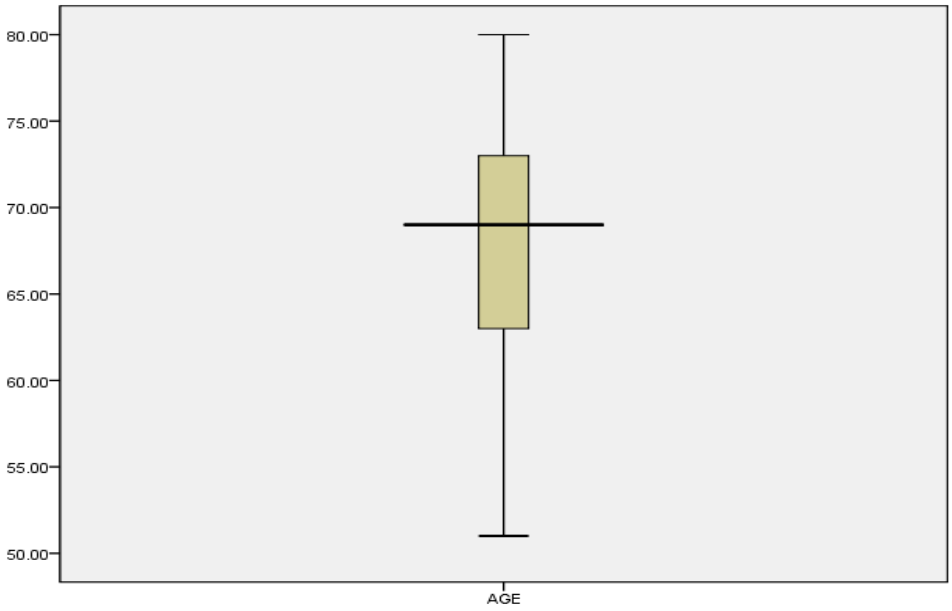

Figure 1: Showing age distribution of study participants.

Table 1: Qualitative comparison of pre and postoperative parameters of the study participants: N=35.

Parameters	Preoperative n=35	Postoperative n=35	p value
IPSS			
0-8	0	0	0.000
9-19	4	35	
>20	31	0	
Qmax			
<10	35	0	0.041
10-15	0	11	
>15	0	24	
Qavg			
<10	21	35	0.000
10-15	14	0	
Tmax			
<10	0	35	0.001
10-15	28	0	
>15	7	0	

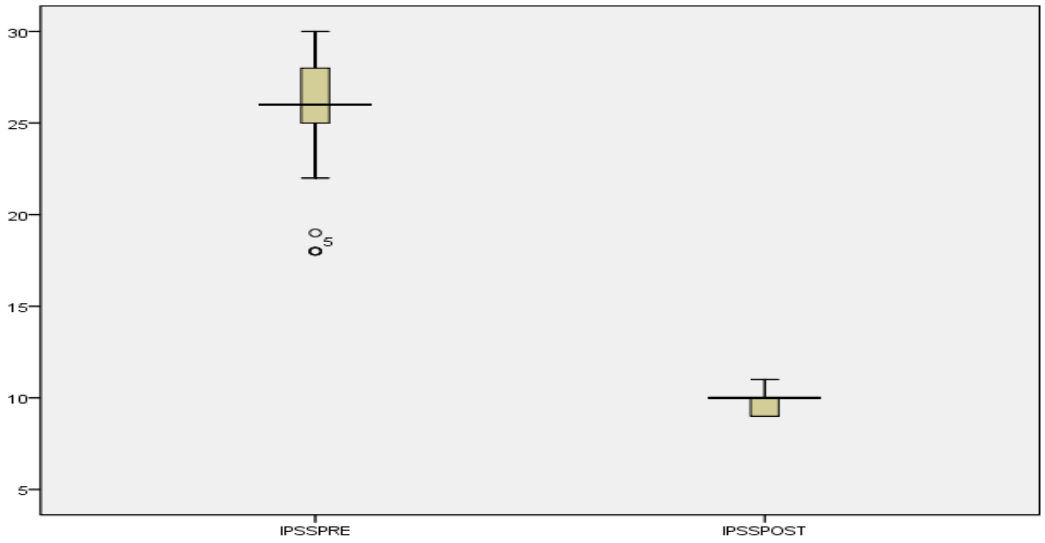

Figure: 2 Quantitative distribution of IPSS scores pre and post op.

*Note: Values as generated with SPSS lesser than 3 decimal places.

Table: 2 Quantitative analyses of pre and postoperative parameters of the study participants: N=35.

Parameters	Preoperative Mean (SD)	Postoperative Mean (SD)	t Statistic	p value
IPSS	25.40 (3.5)	9.77 (0.770)	27.724	0.000*
QMax	7.3 (0.808)	16 (0.970)	-45.527	0.000*
Qavg	3.2 (0.677)	9.29 (0.860)	-44.021	0.000*
Tmax	14.23 (1.848)	6.77 (0.598)	27.954	0.000*
F tm	84.26 (20.043)	28.63 (2.211)	17.704	0.000*

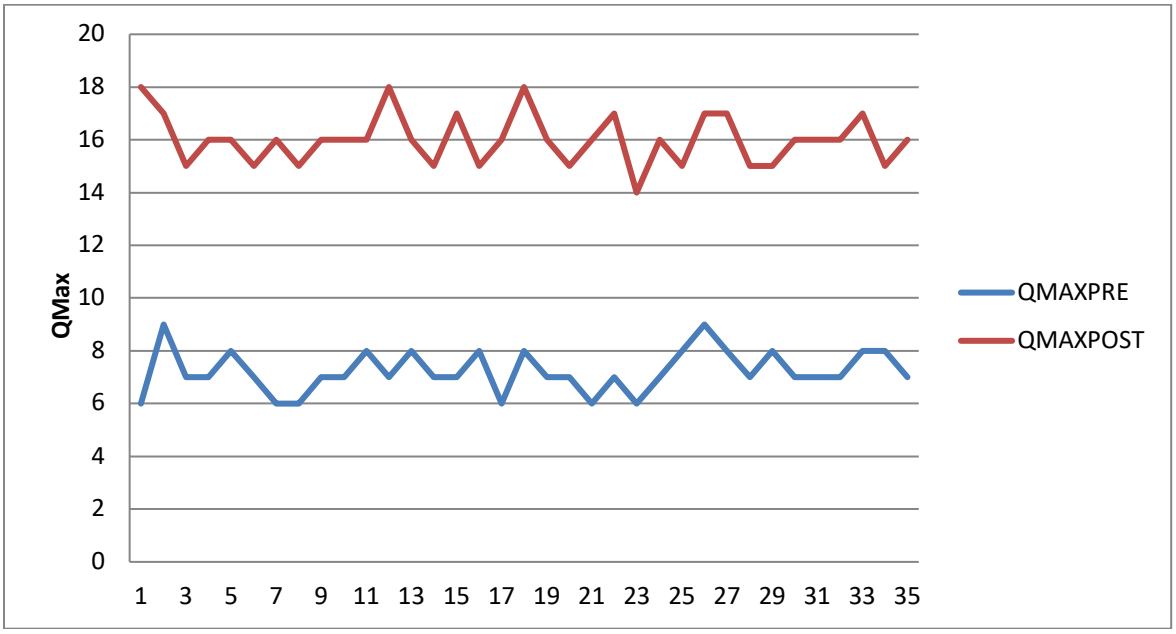

Figure 3: Representation of Qmax across the study groups

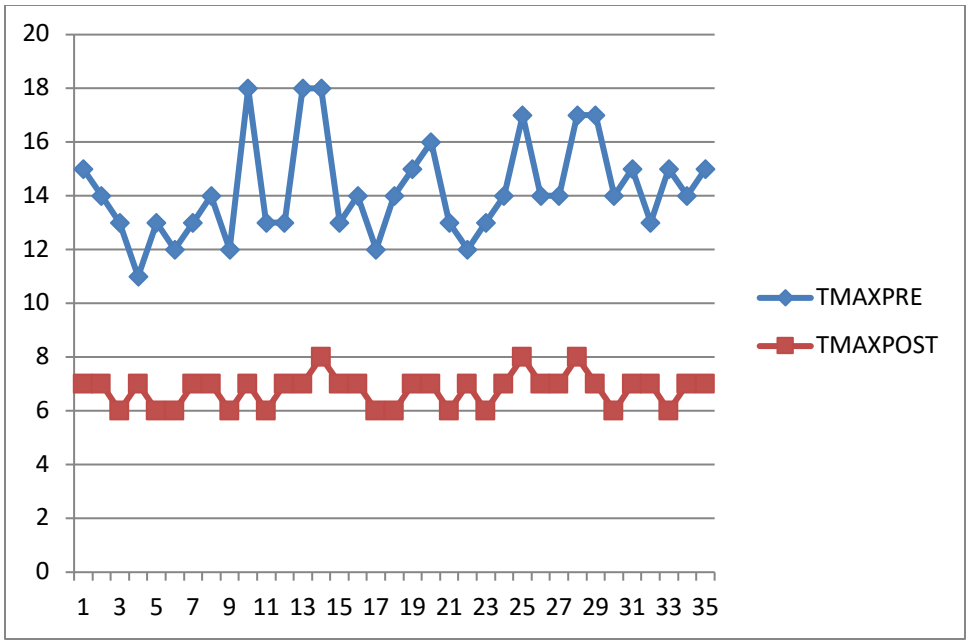

Figure 4: Representation of Tmax across the study groups

Table 2 reveals the quantitative analyses of the study parameters. Values were observed as mean and standard deviation and value of t statistic was calculated to observe significance of difference between the two pre and post-operative parameters.

IPSS score significantly improved from 25 pre operatively to 9.77 postoperatively ($t=27.724$, $p<0.05$). (Figure 2) Qmax and Qavg values pre operatively were 7.3 and 3.2 respectively which post operatively turned out to be 16 and 9.29 respectively ($t=-45.527$ and -44.954, $p<0.05$ for both respectively. (Figure 3)

Tmax was 6.77 post operatively which was also significantly different from the value of 14.23 pre operatively ($t=27.954$, $p<0.05$).Ftm also was observed to be reduced from the value of 84.26 pre operatively to 28.63 after the operation ($t=17.704$, $p<0.05$) (Table 2) (Figure 4)

Discussion

Older men are more likely to develop benign prostatic hyperplasia, which can cause problematic LUTS and have a negative impact on QoL, social functioning, humiliation, and anxiety. Without specialized testing, it may be challenging to identify the clinical symptoms and signs that point to bladder outlet obstruction.

Therefore, it is crucial to create a strategy that identifies possible individuals who may benefit from TURP through routine investigations and pertinent examinations [5]. From the time a male cross the early age, the prostate grows larger as he gets older. Two well-known risk factors for benign prostatic hyperplasia are ageing and functioning testicles [6]. Urgency, frequency, and nocturia are among the storage (irritative) symptoms. Hesitancy (straining for micturition), a weak stream, irregularity, and a feeling of incomplete emptying are among the voiding (Obstructive) symptoms [7,8].

The mean age of the study population was 67.9143 years in the current study, which included 35 patients with LUTS related to BPH who had had TURP. In a study by Singla S *et al*., with patients' mean ages of

67.7 years, identical results were obtained [9]. In a study after TURP, all patients showed a significant improvement in terms of Qmax, voided volume, and voiding time. Pre-to-post TURP mean (+/-SD) IPSS change was 16.2 (+/-0.76) (p 0.05) similar to the findings of the present study [10].

In a study which comprised of a total of 70 clinical BPH patients. The patients' average age was 63.1 +/- 3.0 years. The outcome of transurethral resection of the prostate was determined to be favorable in 81.4% of patients after 6 weeks, and in 62 (88.6%) of patients after 12 weeks.

The mean IPSS before surgery was 22.5 while the mean IPSS after surgery was 6.5 which corresponds to the results of the present study [11].

Limitation

Due to the fact that this was a single-center study and the sample size was rather small, caution must be exercised when generalizing the findings.

Conclusion

Both the symptoms and the result of TURP can be predicted using uroflowmetry data. When evaluating the symptom complex of LUTS with BPH, the IPSS is helpful.

References

1. Hutchison A, Farmer R, Chapple C, Berges R, Pientka L, Teillac P, *et al*. Characteristics of patients presenting with LUTS/BPH in six European countries. Eur Urol. 2006;50(3):555-62.
2. Parsons JK, Bergstrom J, Silberstein J, Barrett-Connor E. Prevalence and characteristics of lower urinary tract symptoms in men aged > or =80 years. Urology. 2008;72(2):318-21.
3. Reynard JM, Yang Q, Donovan JL, Peters TJ, Schafer W, de la Rosette JJ, Dabhoiwala NF, Osawa D, Lim AT, Abrams P. The ICS-'BPH' Study: uroflowmetry, lower urinary tract symptoms and bladder outlet obstruction. Br J Urol. 1998 Nov;82(5):619-23.
4. D'Silva KA, Dahm P, Wong CL. Does this man with lower urinary tract symptoms have bladder outlet obstruction? The Rational Clinical Examination: a systematic review.JAMA. The Journal of the American Medical Association 2014;312(5):535-42.
5. NareNdra JB, kumar S, Raviikumar GV. Comparative Evaluation of Uroflowmetric Parameters in Patients with Benign Prostatic Hyperplasia Undergoing Transurethral Resection of the Prostate. Journal of Clinical and Diagnostic Research. 2019 Dec; 13(12): PC09-PC12.
6. Tang J, Yang J. Etiopathogenesis of benign prostatic Hyperplasia. Ind J Urol2009;25:312–7.
7. Kok ET, Bohnen AM, Groneveld FP, Busschbach JJ, Blanker MH, Bosch JL. Changes in disease specific and generic quality of life related to changes in lower urinary tract symptoms: the Krimpen study. Journal of Urology 2005;174:1005–8.
8. Glover L, Glannon K, McLoughlin J, Emberton M. Mens experience of lower urinary tract symptoms: factors relating to bother. Br J Urol Intern 2004;94:563–7.
9. Singla S, Garg R, Singla A, Sharma S, Singh J, Sethi P. Experience with uroflowmetry in evaluation of lower urinary tract symptoms in patients with benign prostatic hyperplasia. J Clin Diagn Res. 2014;8(4):NC01-03.
10. Rahman MH, Islam MA, Joarder AI, Mannan M, Bhuiyan MR, Paul BK. Uroflowmetry before and after transurethral resection of prostate for bladder outlet obstruction. Mymensingh Med J. 2010 Oct;19(4):601-7.

11. Bozdar HR, Memon SR, Paryani JP. Outcome of transurethral resection of prostate in clinical benign prostatic hyperplasia. J Ayub Med Coll Abbottabad. 2010 Oct-Dec;22(4):194-6.