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Clinical Prospective Cross Sectional Study of Benign Enlargement of Prostate and Its Surgical Management at Tertiary Care Centre

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ABSTRACT: **Background:** Transurethral resection of prostate (TURP) to treat benign enlargement of prostate (BEP) has been the gold standard for decades.Hence,the present study was undertaken to assess clinical features, indications and outcomes of TURP in patients with BEP in a Tertiary Care Centre. **Method:** A total 100 patients of age >50 years presented with symptoms of BPH, BPE and lower urinary tract symptoms (LUTS) were enrolled in the study. A detailed history, all relevant investigations were done and symptoms were assessed by International Prostatic Symptom Score (IPSS) System. Patients were managed either medically on outpatient basis or admitted and posted for surgery (TURP) and followed at discharge and at 3 months if undergone surgery or once in 3 months in case of medical management. **Results:** The mean age of patients was 65.13±7.84 years. All patients presented with LUTS which were either obstructive (52%) or irritative symptoms (48%). Mean prostate specific antigen (PSA) of patients was 3.50±1.33ng/ml. The mean post-operative IPSS score at 3 months follow up was significantly lesser (12.11±5.08) than preoperative (baseline) score (23.13±8.60), (P<0.001). Preoperatively majority of patients (67%) had severe symptoms while postoperatively at 3 months follow up 89% of patients had mild symptoms. The preoperative mean maximum urinary flow rate (Qmax) was 9.63±2.65 mL/s and postoperatively at time of discharge Qmax was 19.68±2.45 mL/s and at 3month follow up it was 22.57±2.54 mL/s, (P<0.001). 4% patients developed UTI, 2% developed urinary incontinence and 1% patient presented with secondary haemorrhage.**Conclusion:**TURP is an effective treatment of BPH as assessed by IPSS and urinary flow parameter (Qmax) and is associated with minimal complications.

KEYWORDS: Benign Prostatic Hyperplasia, Transurethral resection of prostate, International Prostatic Symptom Score, Antigen, Maximum urinary flow rate, Haemorrhage

I. INTRODUCTION

Benign prostatic hyperplasia (BPH), also called prostate enlargement, is a noncancerous increase in size of the prostate gland. Clinically apparent BPH has negative effects on quality of life (QOL) of older men [1] and actual prostatic hyperplasia starts at approximately 40 years of age and develops as a strictly age-related phenomenon in nearly all men. Symptoms may include frequent urination, trouble starting to urinate, weak stream, inability to urinate, or loss of bladder control [2] However, it is a histological diagnosis associated with unregulated proliferation of connective tissue, smooth muscle and glandular epithelium [3].

Although the degree to which the prostate grows varies from man to man as they age and may constrict the urethra and cause difficulty with urination. Left untreated, BPH may lead to lower urinary tract symptoms (LUTS), bladder or kidney damage, bladder stones or incontinence [4]. However, LUTS are traditionally divided into voiding or obstructive (Urinary Hesitancy, Straining, Weak Stream, Terminal Dribbling, Prolonged Voiding, Incomplete Emptying) and Irritative (Urinary Frequency, Urgency, Nocturia, Urge Incontinence, Small Voided Volumes) symptoms [1]. LUTS results from BOO and/or due to neurophysiological changes of bladder neck and urinary bladder and aim of treatment is to relieve/reduce LUTS with medical or surgical treatment [5]. Medical management is often the first line of treatment with approximately 75% of symptomatic men >50 years of age requiring medical management for BPH of whom 20%–30%

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may require surgical intervention before reaching 80 years of age. The pharmacological agents; alpha-blockers, 5-alpha reductase inhibitors, anti-cholinergic agents and phosphodiesterase-5 inhibitors provide significant symptomatic improvement for BPH, especially beneficial when used in combination [6, 7].

In addition, invasive surgical therapies remain the gold standard for refractory and complicated BPH disease. The goal of surgical therapy is to "debulk" the prostate to effectively reduce resistance to urine flow. Transurethral resection of the prostate (TURP), transurethral incision of the prostate (TUIP), and laser therapies are endoscopic therapies that result in significant relief of LUTS in patients with BPH and improve quality of life (QoL) [8]. There are relatively few comprehensive clinical studies published from India on benign enlargement of prostrate despite of a great need to study the precise method of diagnosis of BPH and the various management options including medical or surgical, to improve the quality of life. Thus, the present study was conducted to assess clinical features, indications and outcomes of Transurethral resection of the prostate (TURP) in patients with benign enlargement of prostate (BEP) in a tertiary care centre.

II. MATERIALS AND METHODS

The present cross-sectional study was conducted in total 100 patients of age >50 years presented with symptoms of BPH, BPE and also presented with lower urinary tract symptoms either in surgical OPD or admitted in surgical wards of Tertiary Care Center during a period from November 2017 to October 2019. Patients with-age <50years, large prostate size >100cc, compromised cardiorespiratory status, bleeding disorder, hypertension/DM, senile debilitated and those patient not wiling for the procedure were excluded from the study. Approval from Institutional Ethical Committee was taken prior to commencement of the study and written informed consent was taken from all selected patients.

A detailed history and sociodemographic data was taken using proforma and physical examination including neurological examination was done. Symptoms of the patients were assessed by International Prostatic Symptom Score (IPSS) System which assesses the occurrence of seven symptoms characteristic of benign prostatic hyperplasia. The total score reflects the overall severity of the patient's condition: 1-7 mild, 8-19 moderate, 20-35 severe. Patients were further evaluated by laboratory or radiological investigations such as digital rectal examination, USG prostate, serum PSA, uroflowmetry, pre-anaesthetic investigations and urine routine microscopy and urine culture sensitivity.

Based on the above investigation patients were managed either medically on outpatient basis or admitted and posted for surgery (TURP) after thorough evaluation regarding fitness for surgery. The surgical specimen was sent for histopathological examination. Patients were followed up in the outpatient department where Symptom Scoring (IPSS), clinical examination, urinalysis, uroflowmetry (at discharge and at 3 months if undergone surgery or once in 3 months in case of medical management). All patients were also monitored for complications once in three months during the period of study. Secondary hemorrhage was defined as bleeding between 48 h and 30 days post-surgery requiring hospital attendance with or without admission.

III. STATISTICAL ANALYSIS

Data was compiled in Microsoft excel and analysis was done using Statistical Package for the Social Sciences (SPSS) version 23.0. Continuous parameters (quantitative data) were presented as Mean ±SD and categorical (qualitative data) variables were presented as percentage and proportions (%). Significance of difference between proportions was analyzed by Chi-square test/Fischer's exact test as applicable. Significance of difference between means of quantitative variables was analyzed by paired student t test or one way ANOVA as applicable. A p value of 0.05 was taken as level of significance and p value <0.05 was considered statistically significant and <0.001 was considered highly significant.

IV. OBESERVATIONS AND RESULTS

The mean age of patients of benign prostatic hyperplasia was 65.13±7.84 years, ranged from 51-82 years. The majority of (53%) patients were in the age group of 61-70 years followed 51-60 years (24%). All patients presented with LUTS which were either obstructive (52%) or irritative symptoms (48%). The mean prostate specific antigen (PSA) of patients was 3.50±1.33 ng/ml and in majority; (72%) of patients PSA was in the range of 0-4 ng/ml as shown in table 1.

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Table 1: Distribution of patients according to age group, LUTS and PSA

Age groups (Years)		No. of Patients	Percentage
51-60		24	24
61-70		53	53
71-80		17	17
>80		6	6
LUTS	Obstructive	52	52
	Irritative	48	48
PSA(ng/ml)	0-4	72	72
	4.1-9.9	28	28
	>10	0	0

The mean preoperative (baseline) international prostate symptom score (IPSS) of patients was 23.13±8.60 and post operatively at 3 months follow up it was 12.11±5.08. Thus the mean post-operative IPSS score at 3 months follow up was significantly lesser than the preoperative (baseline) score in patients of BPH and this difference was found to be statistically highly significant, (P<0.001).

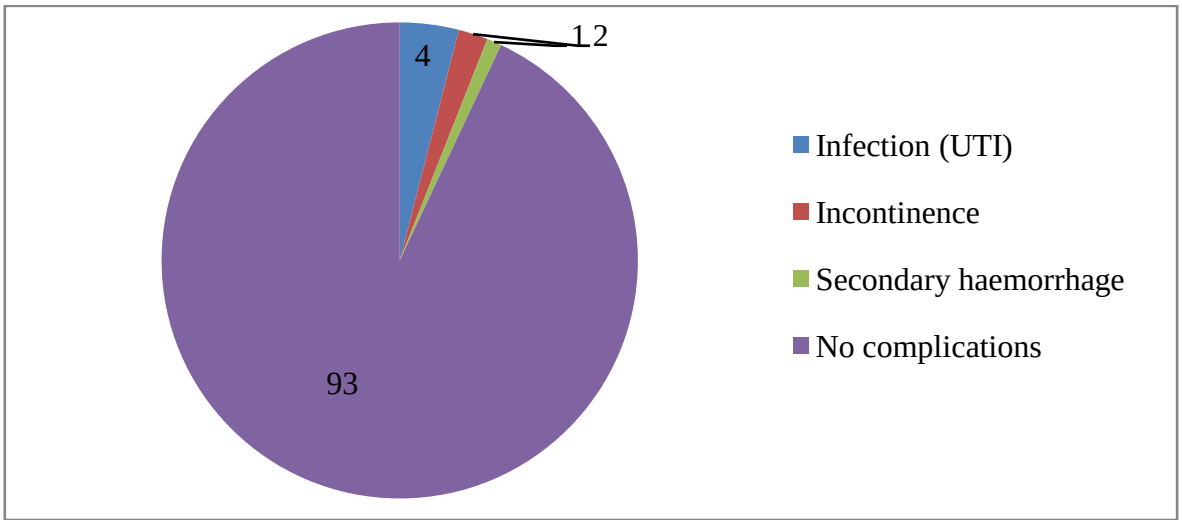
Preoperatively (baseline) majority of patients (67%) had severe symptoms (IPSS score-20-36) while postoperatively at 3 months follow up majority 89(89%) of patients had mild symptoms (IPSS score was 0-7) as shown in table 2

Table 2: Preoperative and 3 month follow up range of IPSS Scores in patients of BPH

IPSS Score	Pre-operative	At 3 months	P value
0 to 7 (Mild)	2 (2%)	89 (89%)	<0.001**
8 to 19 (Moderate)	31 (31%)	11 (11%)	
20 to 36 (Severe)	67 (67%)	0 (0%)	

The preoperative mean maximum urinary flow rate (Qmax) was 9.63±2.65 mL/s and postoperatively at time of discharge mean maximum urinary flow rate (Qmax) was 19.68±2.45 mL/s and at 3month follow up it was 22.57±2.54) mL/s, (P<0.001). No complications were observed in majority 93(93%) of patients. Post-operative complications in patients of benign prostatic hyperplasia are depicted in figure1.

Figure 1: Post-operative complications in patients of BPH



V. DISCUSSION

TURP remains the gold standard surgical treatment for BEP. Medical therapy has also proved its efficacy and safety in the management of BEP. The lifetime occurrence of surgical or medical intervention in men aged 50 years for BEP is calculated to be 35% [9, 10]. Moreover, the surgical outcome of TURP in patients of BPE with

detrusor underactivity remains debatable due to paucity of data. Geriatric patients are difficult to treat population having multiple comorbidities, long lasting high post void residual (PVR), decompensated detrusor, and multiple drug intake having an impact on the urinary system. Clinical and urodynamic parameters remain in the armamentarium for predicting surgical outcome in patients with detrusor underactivity and prostatic enlargement [11]. In the present study, mean age of patients was 65.13±7.84 years and majority 53(53%) of patients were in the age group of 61-70 years which is comparable with the other studies [5, 12, 13]. Prevalence of BPH is known to increase with increasing age as evident in findings of present study and previous studies. Increasing histologic BPH was never observed in men under the age of 30 years. Approximately half of men in the sixth decade of life exhibited histologic evidence of BPH. Almost 90% of men developed histologic BPH by the ninth decade of life [14].

LUTS are traditionally divided into voiding or obstructive and storage or irritative symptoms. Voiding symptoms are more common, however it is storage symptoms that are most bothersome and have a greater impact on a patient's life [1]. In existing study, all patients of BPH were presented with LUTS which were either obstructive or irritative symptoms. Obstructive symptoms such as hesitancy, straining, weak flow, prolonged voiding, partial urinary retention and overflow incontinence were present in 52(52%) patients. The irritative symptoms were increased frequency, urgency of micturition with urge incontinence, nocturia, and painful urination and small voided volumes and were present in 48(48%) patients. 39(39%) patients had diabetes mellitus and 61(61%) patients did not have diabetes mellitus. These findings are correlated with the study done by Rao et al [15] and Mane et al [16].

A serum prostate-specific antigen (PSA) assay is recommended as part of the additional diagnosis. Because benign prostatic hyperplastic tissue makes prostate-specific antigen, it is not surprising that there is a good correlation between prostate volume and serum PSA [14]. In the current study, mean PSA of patients was 3.50 ±1.33 ng/ml and in majority 72(72%) of patients PSA was in the range of 0-4 ng/ml.

The mean IPSS score at 3 month follow up post operatively/ in those on medical treatment was significantly lesser than the preoperative (baseline) score in patients of BPH suggestive of significant improvement in symptoms of LUTS from baseline. Preoperatively majority of patients (67%) had severe symptoms, 31(31%) patients had moderate symptoms and 2(2%) patients had mild symptoms. Post operatively/ in those on medical treatment at 3 month follow up majority of patients (89%) had mild symptoms, only 11(11%) patients had moderate symptoms and none of the patients had severe treatment. Similar improvements in mean IPSS scores from baseline to post-operative scores at follow up have been reported in the earlier studies [17-19]. The IPSS and AUA Symptom Index are validated and are sensitive to be to be used in the evaluation of symptoms and selection of treatment which is further strengthened by the pre and post-operative scores in present study and previous studies. Bother score is the primary determinant of whether or not a patient proceeds to further treatment. Further, these questionnaires are a valuable objective measure when determining the response to treatments for BPH.

Mean post-operative maximum flow rate (Qmax) at the time of discharge and at 3 months follow up post operatively/ in those on medical treatment was significantly higher (mean improvement10.05cc/s at discharge and 12.94 cc/s at 3month follow up) than the preoperative (baseline) maximum flow rate. Similar improvements in maximum flow rate (Qmax) have been reported in prior studies [17, 19, and 20]. Uroflowmetry is considered by some as the single most useful urodynamic technique for the assessment of obstructive uropathy [1, 3 and 14]. Of the different urinary flow parameters measured the peak flow rate is the most closely correlated with the extent of outflow obstruction as evidence in significant improvements in postoperative Qmax as compared to preoperative Qmax in the current study and other similar studies [17, 19, and 20]. Total voiding time is prolonged in obstruction and has a reduced Qmax as evidenced in preoperative/baseline mean Qmax in patients of existing study and other studies [17, 19, and 20].

There was no complications were observed in majority (93%) of patients, 4 patients developed urinary tract infection diagnosed on urine examination and culture and were treated with appropriate antibiotics. 2 patients developed urinary incontinence after removal of Foleys catheter; reinsertion of catheter was done and normal voiding was observed when it was removed after a week. 1 patient presented with secondary haemorrhage which required hospital attendance and was successfully managed. The most probable cause of urinary incontinence is oedema at external sphincter, trauma (partial injury) to external sphincter and detrusor instability. There was no mortality. These findings are accordance with the study done by Kallenberg et al [21].

Thus the findings of present study add to the evidences base on effectiveness of TURP in management of patients with BPH.

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Limitation of the study: The present study did not involve long term follow up of patients to assess IPSS, urine flow parameter and morbidity in patients of BPH who were managed by medical treatment or underwent TURP.

VI. CONCLUSION:

All patients of benign prostatic hyperplasia presented with symptoms of lower urinary tract symptoms. Transurethral resection of the prostate is an effective treatment of BPH as assessed by International Prostate Symptom Score and urinary flow parameter (Qmax) and is associated with minimal complications.

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