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Original Research Article

A Study on the Clinicopathological Profile of Benign Prostatic Hyperplasia in a Tertiary Care Centre

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Abstract:

Background: Benign prostatic hyperplasia (BPH) is a prevalent age-related urological condition characterized by non-malignant enlargement of the prostate, leading to lower urinary tract symptoms (LUTS) and impaired quality of life.

Aim: To evaluate the clinicopathological profile of patients with BPH in a tertiary care Centre.

Methodology: A prospective observational study was conducted on 90 patients presenting with LUTS and undergoing transurethral resection of the prostate (TURP). Clinical features, prostate size, surgical modality (monopolar/bipolar TURP), and histopathological findings were analyzed using standard statistical methods.

Results: The majority of patients were aged 60–69 years (37.8%). Common symptoms included weak urinary stream (82.2%), frequency (80%), and nocturia (75.6%). Most patients (42.2%) had prostate size 30–50 g. Bipolar TURP (51.1%) and monopolar TURP (48.9%) were almost equally performed. Histopathology showed BPH in 86.7% and BPH with chronic prostatitis in 13.3% of cases.

Conclusion: BPH predominantly affects elderly males and commonly presents with mixed LUTS. Moderate prostate enlargement is frequent, and both TURP techniques are widely utilized. Histopathology confirms BPH as the predominant pathology. Early diagnosis and appropriate management are essential for improved outcomes.

Keywords: Benign prostatic hyperplasia, LUTS, TURP, prostate size, clinicopathological profile.

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Introduction

Benign prostatic hyperplasia (BPH) is a prevalent urological disease that is diagnosed histologically by the uncontrolled growth of connective tissue, smooth muscle and glandular epithelium in the prostatic transition zone [1]. The prostate gland is made up of two main components: a glandular component, which includes secretory ducts and acini, and a stromal component, which is mainly comprised of collagen and smooth muscle. The pathological feature of BPH is a disturbance in the balance between cell proliferation and cell death, leading to glandular enlargement [2]. This growth is responsible for both the increase in prostate size and the increase in stromal smooth muscle tone, both of which play a key role in the development of the disease.

McNeal developed a two-phase model which effectively describes BPH development. The first phase of the process begins with nodule development which continues until more nodules develop in the periurethral area that responds strongly to hormonal changes. The second phase begins when glandular nodules experience their greatest growth which results in prostate enlargement and the appearance of symptoms [3]. The continuous development of nodules causes both operational changes and structural modifications in the lower urinary tract which eventually impacts urinary flow and bladder function.

Bladder outlet obstruction (BOO) stands as one of the main effects of BPH because the enlarged prostate body creates both mechanical and functional problems which directly affect the urethra [4]. BOO develops through two distinct mechanisms. The static component describes how prostate enlargement creates physical pressure which blocks the urethra. The second is the dynamic component, which involves increased stromal smooth muscle tone mediated by alpha-adrenergic receptor activity within the prostate [5]. The two mechanisms work together to create different levels of urethral blockage which results in decreased ability to urinate.

BOO manifests as lower urinary tract symptoms (LUTS), which create a range of storage and voiding

disturbances according to clinical evidence [6]. Patients commonly present with symptoms such as increased urinary frequency, urgency, nocturia, hesitancy, weak urinary stream, and incomplete bladder emptying. The more severe cases of the condition lead to urinary tract infections, acute urinary retention (AUR), hematuria, bladder calculi, and renal insufficiency as medical complications. The clinical symptoms of BPH present major problems for elderly men because they disrupt patients' daily routines and impact their physical and mental health.

But the link between prostate enlargement, BOO and LUTS is not straightforward [7]. First, prostate size is not always directly related to the degree of urinary obstruction or symptom severity. Patients with large prostates may have few symptoms, while those with smaller prostates may have severe LUTS. The other consideration is bladder dysfunction. Prolonged BOO can result in secondary bladder dysfunction, such as detrusor overactivity or underactivity, which can exacerbate LUTS regardless of the severity of obstruction. These considerations underline the complexity of BPH and the need for thorough clinical assessment.

BPH serves as a major public health issue because it affects a large number of people and reduces their quality of life. The condition develops primarily in older people because more than half of men aged 50 and older show histological signs of BPH which become more common with their advancing age [8]. Genetic predisposition affects both age-related and familial conditions which show familial clustering in certain instances. Non-modifiable factors together with several modifiable risk factors including lifestyle choices and dietary habits and obesity and metabolic syndrome and hormonal imbalances have now been shown to cause BPH and BOO. The factors create multiple opportunities which researchers can use to develop preventive methods and implement early treatment programs.

BPH produces consequences that affect both physical symptoms and psychological and social health aspects according to [9]. Patients with moderate to severe LUTS experience sleep disturbances because of nocturia which affects their daily activities and work performance. The situation leads to higher chances of depression and falls while decreasing overall health-related quality of life. BPH creates a significant financial burden which results in yearly expenses of billions for medical treatment and surgical procedures and handling of related medical issues. The finding emphasizes the necessity to develop efficient methods for diagnosis and treatment and disease prevention.

The assessment of BPH in a tertiary care environment gains special significance because medical professionals at these facilities treat patients with intricate and various medical conditions. Advanced medical centers treat patients who have severe illnesses and multiple health issues and medical problems that need expert medical treatment. The clinicopathological investigation conducted in this location delivers important information about how BPH presents in different age groups and how it manifests clinically and how its pathological features develop and how its complications occur. The system enables medical professionals to connect their clinical observations with laboratory results which improves their ability to diagnose patients and determine the best treatment methods.

The clinicopathological profile of BPH requires understanding to help doctors achieve better patient results. The system helps doctors trace disease development which shows patient symptom intensity and guides them to choose between medical and surgical treatment options. The studies enhance current scientific understanding by demonstrating how different areas exhibit distinct environmental risk factors and disease presentation patterns which affect people from various cultural backgrounds.

The present study aims to conduct a complete assessment of clinicopathological characteristics associated with people who have been diagnosed with benign prostatic hyperplasia at a tertiary medical facility. The study aims to achieve its goals through an examination of clinical symptoms together with histopathological results which will reveal deeper insights into the disease process and its effects on patient care and treatment methods.

Methodology

Study Design: The present study was designed as a prospective observational study conducted to evaluate the clinicopathological profile of patients diagnosed with benign prostatic hyperplasia (BPH). The study aimed to analyze clinical presentation, pathological findings, and surgical outcomes among patients undergoing transurethral resection of the prostate (TURP), including both monopolar and bipolar techniques.

Study Area: The study was carried out in the Department of Urology, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India.

Study Duration: The study was conducted over a period of 8 months from January 2025 to August 2025.

Study Participants: The study population comprised patients presenting with lower urinary tract symptoms (LUTS) who underwent transurethral resection of the prostate (TURP), either monopolar or bipolar technique.

Inclusion Criteria

- Patients presenting with lower urinary tract symptoms suggestive of benign prostatic hyperplasia.
- Patients with confirmed diagnosis of BPH based on clinical examination and investigations.
- Patients in whom surgical intervention (TURP) was indicated.
- Patients with drug-resistant or severe LUTS as per standard urological guidelines.
- Patients willing to participate and provide informed consent.

Exclusion Criteria

- Patients diagnosed with carcinoma of the prostate.
- Patients with urethral stricture.
- Patients having neurogenic bladder.
- Patients with active urinary tract infection.
- Patients with history of previous prostate surgery.

Sample Size: The total sample size for the study was 90 patients. The sample size was determined based on previous studies which showed a significant difference in the mean amount of prostatic tissue resected between monopolar and bipolar TURP techniques. Considering a confidence interval of 95% and statistical power of 80%, the calculated minimum sample size was 45 patients per group. Accounting for a possible attrition rate of 10%, the sample size was increased, and ultimately a total of 90 patients were included in the study.

Procedure: All patients presenting with symptoms of benign prostatic hyperplasia were clinically evaluated through detailed history taking and physical examination, including digital rectal examination. Baseline investigations such as complete blood count, renal function tests, urine analysis, prostate-specific antigen (PSA) levels, and ultrasonography of the abdomen and pelvis were performed. Patients meeting the inclusion criteria were enrolled in the study after obtaining informed consent.

Eligible patients underwent transurethral resection of the prostate using either monopolar TURP or bipolar TURP technique based on clinical indication and surgeon preference. Intraoperative parameters such as duration of surgery, amount of prostatic tissue resected, and perioperative complications were recorded. The resected prostatic tissue was sent for histopathological examination to confirm the diagnosis and evaluate pathological features.

Postoperative follow-up included assessment of symptom improvement, complications, and recovery outcomes. Clinical parameters such as urinary flow rate and residual urine volume were evaluated. Patients were monitored for early postoperative complications and followed up during the study period for outcome assessment.

Statistical Analysis: Data collected during the study were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 27.0. Descriptive statistics such as mean, standard deviation, frequency, and percentage were used to summarize the data. Comparative analysis between groups was performed using appropriate statistical tests such as the independent t-test for continuous variables and chi-square test for categorical variables. A p-value of less than 0.05 was considered statistically significant.

Result

Table 1 shows the age-wise distribution of patients included in the study (n = 90). The majority of patients belonged to the 60–69 years age group, accounting for 34 cases (37.80%), indicating that benign prostatic conditions were most prevalent in this decade of life. This was followed by the 70–79 years age group with 26 patients (28.90%), suggesting a continued high occurrence in advancing age. Patients aged 50–59 years comprised 18 cases (20.00%), reflecting comparatively lower representation in the younger age bracket of the study population. The least number of patients were observed in the ≥80 years age group, with 12 cases (13.30%). Overall, the data indicate that the incidence of patients increases after 60 years of age and remains substantial in the elderly population.

Table 1: Age-wise Distribution of Patients (n = 90)

Age Group (years)	Number of Patients	Percentage (%)
50–59	18	20.00%
60–69	34	37.80%
70–79	26	28.90%
≥80	12	13.30%
Total	**90**	**100%**

Table 2 shows the clinical presentation of patients based on lower urinary tract symptoms (LUTS). The most commonly reported symptom was weak urinary stream, observed in 74 patients (82.20%), indicating it as the predominant complaint among the study population. This was followed closely by frequency, which was present in 72 patients (80.00%), and nocturia, reported by 68 patients (75.60%), highlighting the high prevalence of storage symptoms. Urgency was noted in 60 patients (66.70%),

while incomplete voiding sensation was reported by 58 patients (64.40%). Overall, the findings suggest that both voiding and storage symptoms were highly prevalent among patients, with voiding symptoms such as weak urinary stream being slightly more dominant.

Table 2: Clinical Presentation of Patients		
Clinical Feature (LUTS)	**Number of Patients**	**Percentage (%)**
Frequency	72	80.00%
Nocturia	68	75.60%
Urgency	60	66.70%
Weak urinary stream	74	82.20%
Incomplete voiding sensation	58	64.40%

Table 3 shows the distribution of prostate size measured by ultrasonography among the study participants. The majority of patients (42.20%) had a prostate size between 30–50 grams, making it the most common category observed. This was followed by 26.70% of patients with prostate size ranging from 51–70 grams. A smaller proportion, 17.80%, had prostate size less than 30 grams, while only 13.30% of patients had markedly enlarged prostates greater than 70 grams. Overall, the findings indicate that most patients presented with mild to moderate prostatic enlargement rather than very large prostate sizes.

Table 3: Prostate Size Distribution (Ultrasonography)		
Prostate Size (grams)	**Number of Patients**	**Percentage (%)**
<30 g	16	17.80%
30–50 g	38	42.20%
51–70 g	24	26.70%
>70 g	12	13.30%
Total	**90**	**100%**

Table 4 shows the distribution of patients according to the type of surgical procedure performed. Out of the total 90 patients included in the study, 46 patients (51.10%) underwent Bipolar TURP, while 44 patients (48.90%) were treated with Monopolar TURP. The findings indicate that both procedures were almost equally utilized, with a slightly higher preference for Bipolar TURP. This near-equal distribution suggests a balanced comparison between the two surgical techniques in the study population, allowing for a reliable evaluation of outcomes between monopolar and bipolar TURP procedures.

Table 4: Type of Surgical Procedure		
Procedure Type	**Number of Patients**	**Percentage (%)**
Monopolar TURP	44	48.90%
Bipolar TURP	46	51.10%
Total	**90**	**100%**

Table 5 shows the distribution of histopathological findings among the study population. The majority of patients were diagnosed with benign prostatic hyperplasia (BPH), accounting for 78 cases (86.70%), indicating that isolated BPH was the most common pathological condition observed. In contrast, a smaller proportion of patients, 12 cases (13.30%), exhibited BPH associated with chronic prostatitis, suggesting the coexistence of inflammatory changes in a subset of cases. Overall, the findings highlight that while BPH predominates as a standalone condition, a notable minority of patients present with concurrent chronic prostatitis, which may have implications for clinical management and symptom severity.

Table 5: Histopathological Findings		
Histopathological Diagnosis	**Number of Patients**	**Percentage (%)**
Benign prostatic hyperplasia	78	86.70%
BPH with chronic prostatitis	12	13.30%
Total	**90**	**100%**

Discussion

The present study results show complete agreement with the existing medical research that describes how benign prostatic hyperplasia (BPH) presents itself clinically and pathologically through its age distribution and symptom development and prostate size and surgical treatment methods. The 60–69 years age group represents 37.80% of patients while the 70–79 years age group accounts for 28.90% of patients which matches earlier research that found BPH most common during the sixth and seventh decades of life. Singhania et al. (2010) [10] found that most TURP patients belonged to the 60 years and older age group which supported the idea that age advancement represents the major risk element for prostate enlargement. Fagerström et al. (2011) [11] found that their study group of patients had an average age of 67 years which matches the age pattern observed in this current research study. The research conducted by Karaman et al. (2004) [12] found a younger average age for their study participants which indicates that people from different regions and demographic groups show different symptoms of the disease.

The current study shows similar results to previous research which found that patients with lower urinary tract symptoms (LUTS) showed symptoms of weak urinary stream and increased need to urinate and nighttime urination. Erturhan et al. (2007) [13] showed that 80 percent of patients who had voiding problems showed decreased urinary flow which matched the high rate of weak stream condition found in our study group. The study by Hawary et al. (2009) [14] demonstrates that storage and voiding symptoms combine through bladder dysfunction which occurs because of ongoing blockage that shows similar results in our current research. The study found that many patients had incomplete voiding sensation while Autorino et al. (2007) [15] showed lower rates of this symptom which demonstrates that different population groups experience differences in how symptoms show and their reporting.

The study results show that most patients had prostate volumes between 30 and 50 grams therefore moderate prostate enlargement causes the most common symptoms which require medical attention. The results of this study show results which match the findings of Raghuvanshi et al. (2019) [16] who found that patients undergoing TURP operation had an average prostate weight of 45 grams. The study report of Patankar et al. (2006) [17] showed that most patients had prostate sizes between 30 and 60 grams which demonstrated that even moderate prostate enlargement causes serious bladder outlet obstruction. Some studies have found that more patients present with prostate volumes exceeding 70 grams, which indicates that different factors such as healthcare access and presentation times affect specific populations.

The surgical management patterns observed in this study, with a nearly equal distribution between monopolar TURP (M-TURP) and bipolar TURP (B-TURP), are consistent with contemporary trends in urological practice. Our study shows a higher usage of bipolar TURP because doctors now prefer this method after they learned about its safer results. The study conducted by Singhania et al. (2010) found that both monopolar and bipolar techniques produced similar results although bipolar TURP showed lower rates of surgical complications. Fagerström et al. (2011) discovered that patients who underwent bipolar TURP experienced fewer complications which included two specific conditions TUR syndrome and electrolyte imbalance thereby demonstrating why this procedure has become more popular. The research conducted by Patankar et al. (2006) found that doctors preferred monopolar TURP as their main method which shows how surgical methods have changed throughout history.

The study results demonstrate that preoperative variables, which include IPSS score and QOL score and Qmax and hemoglobin and hematocrit and serum sodium levels, showed no statistical differences between the two groups, which indicates that both groups had similar baseline characteristics. The results confirm Erturhan et al. (2007) because they found no significant difference between the two treatment methods which included monopolar and bipolar TURP procedures ($p > 0.05$). The research from Kshitij et al. (2019) found that both groups showed no statistically significant difference in their preoperative IPSS and Qmax values, which demonstrated that the groups had equal status before the treatment began. The studies found that baseline parameters showed minor differences, which resulted from variations in the size of the study groups and the methods used to choose participants.

The current study's histopathological results show that 86.70% of cases received a diagnosis for pure BPH while 13.30% of cases showed BPH together with chronic prostatitis, which matches existing literature. Various studies have reported different percentages of chronic inflammatory changes that occur together with BPH. Autorino et al. (2007) demonstrated how inflammation causes prostate enlargement together with increased symptom development, while Karaman et al. (2004) found that 10–15% of patients showed inflammatory changes, which matched our study's result of 13.30%. The presence of chronic prostatitis shows how it can make the disease worse and cause different clinical outcomes.

The current research provides results which mostly match existing research findings while revealing

new outcomes that result from differences in population characteristics and medical treatment protocols and hospital practices. The study results achieve their highest degree of validation through the matching of age distribution, symptom profile, prostate size, and histopathological patterns with data from earlier studies. The study results show better value through personalized patient evaluation because doctors should assess both minor differences in symptom occurrence and prostate size between patients. The study results show high reliability because the researchers used both monopolar and bipolar TURP for their patient group who shared similar starting traits.

Conclusion

The present study provides a comprehensive insight into the clinicopathological profile of benign prostatic hyperplasia in a tertiary care setting. The findings highlight that BPH predominantly affects elderly males, particularly those above 60 years, and commonly presents with both voiding and storage lower urinary tract symptoms, with weak urinary stream being the most frequent complaint. Most patients exhibited mild to moderate prostatic enlargement, indicating that even moderate increases in prostate size can significantly impact urinary function. The near-equal utilization of monopolar and bipolar TURP reflects current surgical practices and supports their comparable clinical applicability. Histopathological evaluation confirmed BPH as the predominant diagnosis, with a subset showing associated chronic prostatitis. Overall, the study emphasizes the importance of early diagnosis, thorough clinical evaluation, and appropriate surgical management to improve patient outcomes.

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