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ORIGINAL ARTCLE

Management of Lower Urinary Tract Symptoms Attributed to Benign Prostatic Hyperplasia (BPH)

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ABSTRACT

Background: Benign Prostatic Hyperplasia (BPH) is a common condition affecting older men, causing lower urinary tract symptoms (LUTS) such as urinary frequency, urgency, weak stream, and nocturia.
Aim: To compare the effectiveness of medical versus surgical treatments in managing lower urinary tract symptoms associated with benign prostatic hyperplasia (BPH).
Methods This case-control study was conducted at Akber Medical Complex, Mardan during December 2022 to December 2023, involving 255 patients diagnosed with lower urinary tract symptoms attributed to benign prostatic hyperplasia (BPH).
Results: Surgical treatment for LUTS due to BPH resulted in greater symptom improvement **(**47.7% improvement in IPSS) and quality of life **(**16.2**)** compared to medical treatment **(**32.5% and 12.8**,** respectively). Urinary retentionand post-operative bleeding were more common in the surgical group (8% vs 2% and 5% vs 0%), and hospital stays were longer **(**5.7 days **vs** 3.2 days). Both groups showed similar improvements in urinary flow rate. These findings indicate that while surgery provides better symptom relief, medical treatment remains effective with fewer complications and shorter recovery.
Conclusion: Both medical and surgical treatments are effective in managing LUTS attributed to BPH, with surgical options offering quicker relief and greater long-term benefits. However, medical treatment remains a viable option for patients who are not candidates for surgery or prefer non-invasive treatment. A personalized approach, considering patient comorbidities and preferences, is essential for optimal management.
Keywords: Benign prostatic hyperplasia, UTI, lower urinary tract symptoms

INTRODUCTION

Benign Prostatic Hyperplasia (BPH) exists as a frequent condition that develops in men starting from age 50 before it shows increasing incidence rates as age advances[1].

The prostate organ expands due to non-cancerous factors which produce lower urinary tract symptoms (LUTS) as a result. The urinary symptoms of frequency urgency and weak stream and nocturia and incomplete emptying cause substantial life quality deterioration of patients. BPH develops mainly due to aging alongside hormonal changes because DHT concentrations in prostate tissue progressively increase[2].

BPH usually does not pose a threat to life but can develop serious consequences such as acute urinary retention, repeated urinary tract infections and bladder stones when patients do not receive treatment. The changes taking place during BPH include cellular growth of prostate glandular tissue along with stromal cell and epithelial cell multiplication which results in prostate enlargement[3].

Institutional enlargement advances to a point where it restricts the urethra thus producing problems with urination function. Patients present with different degrees of LUTS ranging from mild to severe urinary problems in their condition. Research shows BPH symptoms affect about 50% of men aged 50 and older before reaching 90% prevalence among males who achieve 80 years of age. A high incidence rate of BPH prompts numerous male patients to leave medical care either because they feel ashamed or because they lack knowledge about available treatments[4,5].

LUTS treatment for BPH involves two main intervention approaches as medical therapies alongside surgical procedures. The first-choice medication for BPH treatment remains tamsulosin together with alfuzosin as alpha-blocker drugs. Alpha blockers along with 5-alpha reductase inhibitors effectively reduce prostate growth by blocking testosterone into dihydrotestosterone thus enabling bladder neck and prostate smooth muscle relaxation to promote urine flow[6].

Combining alpha-blockers with 5-alpha reductase inhibitors delivers better symptom relief to patients who have moderate to severe LUTS. Medical therapy failures along with severe symptoms lead healthcare providers to use surgical treatments like TURP as the most effective standard. A TURP surgical operation seeks to remove the surplus prostate tissue to achieve better urine flow and decrease obstruction. The medical procedures for prostate tissue removal include laser prostatectomy plus the newer method known as prostate artery embolization. The success rate of surgical procedures in symptom relief is high yet their complications include bleeding alongside infection and erectile dysfunction[7].

Research about BPH medical and surgical treatments has mainly focused on effectiveness but research about their direct comparison against each other remains limited. The research intends to fill this knowledge gap through a comparison between surgical and medical BPH treatments by analyzing symptom improvement results (International Prostate Symptom Score (IPSS)) and quality of life impacts together with urinary flow rate and treatment complication rates. Medical treatment of LUTS through TURP surgery proves more effective than its medical counterpart because it produces faster and stronger symptom relief which results in higher IPSS improvement rates and elevated quality of life scores[8].

Medical treatment serves as a valid therapy for patients presenting with less serious symptoms or being unsuitable for surgical intervention. Combination treatment presents itself as an efficient method that helps individuals with moderate to severe symptoms manage their symptoms while reducing possible adverse effects. The research includes an assessment of complications that occur after treatment such as urinary retention along with infections and erectile dysfunction since these are crucial factors in BPH treatment. Surgical interventions tend to present greater complications than medical interventions which show better safety characteristics[9].

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The objective of this study is to compare the effectiveness of medical and surgical treatments in managing lower urinary tract symptoms associated with benign prostatic hyperplasia (BPH), focusing on symptom relief, quality of life, and complication rates.

MATERIALS AND METHODS

This case-control study was conducted at Akber medical complex, Mardanduring December 2022 to December 2023, involving 255 patients diagnosed with lower urinary tract symptoms attributed to benign prostatic hyperplasia (BPH).

Inclusion Criteria:

- Men aged 50 years and older.
- Diagnosed with BPH based on clinical symptoms and ultrasound findings.
- Patients experiencing significant LUTS (e.g., urinary frequency, urgency, weak stream).
- Patients who provided informed consent.

Exclusion Criteria:

- Patients with previous prostate surgery or other urinary tract abnormalities.
- Patients with significant comorbidities such as uncontrolled hypertension, diabetes, or renal failure.
- Patients with a history of prostate cancer or other malignancies.

Data Collection: Data were collected on demographic characteristics, baseline symptom severity (using the International Prostate Symptom Score, IPSS), and quality of life (using the BPH impact index). Patients were followed for 6 months to assess symptom improvement, complications, and post-treatment outcomes, including uroflowmetry and post-void residual volume measurements.

Statistical Analysis: Data were analyzed using SPSS version 26. Continuous variables such as age and symptom scores were presented as mean ± standard deviation, while categorical variables such as mode of treatment and complications were presented as frequencies and percentages. Independent t-tests were used for continuous variables, and chi-square tests were used for categorical variables. A p-value of <0.05 was considered statistically significant.

RESULTS

The mean age of the participants was 64.2± 7.1 years, with no significant difference between the medical treatment group (64.5± 7.3 years) and the surgical treatment group (63.9± 6.8 years, p = 0.45). The mean BMI was 27.5 kg/m², and there was no significant difference between the two treatment groups (p = 0.39). The duration of BPH symptoms was similar between the groups, with an average of 6.8 years across all participants (p = 0.12). Hypertension was present in 40% of the total cohort, with no significant difference between treatment groups (p = 0.18). Diabetes and cardiovascular disease were slightly more common in the surgical group, affecting 20% of patients compared to 16% in the medical group for diabetes, and 14% vs. 10% for cardiovascular disease (Table 1).

After treatment, the post-treatment IPSS score showed significant improvement in the surgical group (10.1) compared to the medical group (14.3, p = 0.01). Symptom improvement was higher in the surgical group (47.7%) compared to the medical group (32.5%, p = 0.02). Quality of life improvement was more pronounced in the surgical group (16.2) compared to the medical group (12.8, p = 0.03), though this difference was modest (Table 2).

Among the total participants, 48% received alpha-blockers, with a higher percentage in the medical group (55%) compared to the surgical group (41%, p = 0.05). 5-alpha-reductase inhibitors were used more frequently in the surgical group (45%) compared to the medical group (25%, p = 0.01). Combination therapy was more common in the medical group (20%) compared to the surgical group (14%, p = 0.08). Surgical treatment was exclusive to the surgical group, with 100% of participants undergoing surgery, compared to 0% in the medical group (p = 0.01) (Table 3).

Urinary retention was significantly higher in the surgical group (8%) compared to the medical group (2%, p = 0.02). Infection rates were higher in the surgical group (8%) compared to the medical group (4%, p = 0.09), though the difference was not statistically significant. Erectile dysfunction occurred more in the surgical group (6%) compared to the medical group (2%, p = 0.07), but this was not statistically significant. Post-operative bleeding was present in 5% of the surgical group, compared to 0% in the medical group (p=0.02), highlighting the higher risk of complications after surgery (Table 4).

The improvement in IPSS score was significantly better in the surgical group (47.7%) compared to the medical group (32.5%, p = 0.02). Quality of life improvement was higher in the surgical group (16.2) compared to the medical group (12.8, p = 0.03). Urinary flow rate showed no significant difference between the two groups (10.2 ml/s for the total group), indicating similar improvements in urine flow. Urinary retention was higher in the surgical group (8%) compared to the medical group (2%, p = 0.02). Adverse drug reactions were slightly more common in the medical group (10%) compared to the surgical group (6%, p = 0.10), but the difference was not statistically significant (Table 5).

Table 1: Demographic Characteristics of Participants

Characteristic	Total (n=255)	Medical Treatment (n=127)	Surgical Treatment (n=128)	p-value
Age (years)	64.2 ± 7.1	64.5 ± 7.3	63.9 ± 6.8	0.45
BMI (kg/m²)	27.5 ± 4.2	27.3 ± 4.3	27.7 ± 4.0	0.39
Duration of BPH Symptoms (years)	6.8 ± 2.5	6.5 ± 2.2	7.0 ± 2.7	0.12
Comorbidities				0.18
- Hypertension	40% (102/255)	42% (53/127)	38% (49/128)	
- Diabetes	18% (46/255)	16% (20/127)	20% (26/128)	
- Cardiovascular Disease	12% (31/255)	14% (18/127)	10% (13/128)	

Table 2: Symptom Severity and Improvement Based on Treatment Approach

Symptom	Total (n=255)	Medical Treatment (n=127)	Surgical Treatment (n=128)	p-value
Initial IPSS Score	20.5 ± 6.1	21.2 ± 6.5	19.8 ± 5.7	0.23
Post-treatment IPSS Score	12.4 ± 5.2	14.3 ± 5.3	10.1 ± 4.8	0.01
Improvement in IPSS Score (%)	39.6% (101/255)	32.5% (41/127)	47.7% (61/128)	0.02
Quality of Life Score	4.8 ± 2.1	5.2 ± 2.4	4.4 ± 1.8	0.09

Table 3: Mode of Treatment Based on Symptom Severity

Treatment Mode	Total (n=255)	Medical Treatment (n=127)	Surgical Treatment (n=128)	p-value
Alpha-blockers	48% (122/255)	55% (70/127)	41% (52/128)	0.05
5-alpha-reductase inhibitors	35% (89/255)	25% (32/127)	45% (57/128)	0.01
Combination Therapy	17% (44/255)	20% (25/127)	14% (19/128)	0.08
Surgical Treatment	52% (133/255)	0% (0/127)	100% (128/128)	0.01

Table 4: Post-treatment Complications

Complication	Total (n=255)	Medical Treatment (n=127)	Surgical Treatment (n=128)	p-value
Urinary Retention	5% (13/255)	2% (3/127)	8% (10/128)	0.02
Infection	6% (16/255)	4% (5/127)	8% (11/128)	0.09
Erectile Dysfunction	4% (10/255)	2% (3/127)	6% (7/128)	0.07
Post-operative Bleeding	3% (8/255)	0% (0/127)	5% (8/128)	0.02

Table 5: Symptom Improvement and Treatment Outcomes Based on Treatment Approach

Outcome	Total (n=255)	Medical Treatment (n=127)	Surgical Treatment (n=128)	p-value
Improvement in IPSS Score	39.6% (101/255)	32.5% (41/127)	47.7% (61/128)	0.02
Improvement in Quality of Life	14.5 ± 3.2	12.8 ± 3.1	16.2 ± 3.0	0.03
Urinary Flow Rate (ml/s)	10.2 ± 4.1	9.8 ± 3.8	10.5 ± 4.4	0.25
Post-treatment Urinary Retention	5% (13/255)	2% (3/127)	8% (10/128)	0.02
Adverse Drug Reactions	8% (20/255)	10% (13/127)	6% (7/128)	0.10

DISCUSSION

This research investigated the performance difference between medical therapy and surgical interventions for treating Lower Urinary Tract Symptoms because of Benign Prostatic Hyperplasia (BPH). This research enrolled 255 participants through a study that separated them into medical treatment receiving patients (127) and surgical procedure patients (128). The study findings demonstrated substantial differences between surgical intervention and medical treatment regarding their impacts on symptoms and quality of life and post-treatment adverse effects and hospitalization period. The study participants averaged 64.2 years old while maintaining equal ages between subjects in medical treatment (64.5 years) and surgical treatment (63.9 years) groups (p = 0.45). The BMI measurement shared parity among all participants and their subgroups with total population showing 27.5 ± 4.2 while medical users had 27.3 ± 4.3 and surgical patients registered 27.7 ± 4.0, and the length of BPH symptoms showed insignificant differences between groups (p = 0.12). The prevalence rate of hypertension reached 40% (102/255) among participants while showing equivalent numbers between medical and surgical treatment patients (42% medical and 38% surgical). The prevalence rates of diabetes and cardiovascular disease matched between both treatment groups demonstrating no statistically important difference based on comorbid disease occurrence (p=0.18)[10].

Both treatment groups demonstrated similar initial IPSS scores to start the study as the medical group averaged 21.2±6.5 points and the surgical group averaged 19.8±5.7 points and the difference was not significant (p=0.23). The surgical group achieved a better symptom resolution based on the IPSS score than the medical group at 47.7 percent (61/128) compared to 32.5 percent (41/127) as demonstrated by a p-value = 0.02[11].

The surgical group had better quality of life score improvement (16.2±3.0) when compared to the medical group (12.8±3.1) which produced a statistically significant difference (p=0.03). Surgical therapy brings about greater symptom relief and enhances quality of life indicators in comparison to medical treatments. The evaluation of treatment approaches showed alpha-blockers used by 55% (70/127) of patients in the medical treatment group surpassed the surgical intervention group at 41% (52/128) as medical patients reported a statistically significant difference with p = 0.05[12].

Additionally 5-alpha reductase inhibitors were applied to 45% (57/128) of surgical patients above the medical group at 25% (32/127) (p=0.01) suggesting surgical patients may exhibit more advanced disease progression or need more complex therapy combinations. All patients from the surgical group received surgery as their treatment option but surgery was selected by 133 out of 255 patients in the whole sample cohort and surgical intervention was absent from the medical treatment group (p = 0.01)[13].

Post-treatment urinary retention occurred in 8% of patients from the surgical group (10/128) but only affected 2% of patients from the medical group (3/127) according to statistical analysis (p = 0.02). Surgical procedures that include transurethral resection of the prostate (TURP) should lead to acute urinary retention as a known sequel following surgical intervention. Post-operative bleeding occurred at a rate of 5% in the surgical group out of 128 patients yet only 0% in the medical group of 127 patients according to study findings where the p-value reached 0.02[14]. Patients receiving surgical treatment experienced an infection rate of 8% (11/128) while medical intervention patients had an infection rate of 4% (5/127) although their statistical comparison (p = 0.09) did not reach significance. Among participants, erectile dysfunction appeared with higher frequency at 6% (7/128) in the surgical group compared to 2% (3/127) in the medical group yet the difference between both groups was not considered statistically notable (p = 0.07)[14].

The surgical treatment group experienced greater symptom improvement based on the IPSS score assessment with 47.7% when compared to the 32.5% improvement in the medical treatment group (p = 0.02) thus validating surgical interventions for managing BPH-related LUTS. The surgical group achieved significantly more quality of life improvement than the medical group as measured by 16.2 ± 3.0 points versus 12.8 ± 3.1 points (p = 0.03)[15].

Research findings showed that treatment approaches did not produce substantial differences in urinary flow rate among patients since the total group's result was 10.2 ± 4.1[16].

CONCLUSION

It is concluded that both medical and surgical treatments are effective in managing lower urinary tract symptoms associated with benign prostatic hyperplasia (BPH). However, surgical treatment offers more significant symptom relief and quality of life improvement compared to medical therapy, particularly in patients with more severe symptoms. The surgical group, however, experienced higher rates of complications, such as urinary retention, infection, and post-operative bleeding.

Ethics approval and consent to participate: This study was approved by the Ethical Review Board of Akbar Medical Complex. All methods were carried out in accordance with the Helsinki Declaration.

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1. Conception and design of or acquisition of data or analysis and interpretation of data.
2. Drafting the manuscript or revising it critically for important intellectual content.
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All authors agree to be responsible for all aspects of their research work.

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