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Impact of transurethral resection of the prostate on erectile function in benign prostatic hyperplasia patients: a descriptive study at a tertiary care hospital

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ABSTRACT

BACKGROUND & OBJECTIVE: Benign prostatic hyperplasia (BPH) is a prevalent condition in older males, primarily responsible for lower urinary tract symptoms (LUTS). Transurethral resection of the prostate (TURP), a frequently utilized surgical procedure for BPH management, has mixed effects on erectile function (EF). The objective of this study is to evaluate the changes in EF following TURP in patients with BPH.

METHODOLOGY: This descriptive study was conducted at Bilawal Medical College for Boys, LUMHS Jamshoro, involving 261 male subjects between the ages of 50 and 70 who underwent TURP. Evaluation of EF was carried out before and after the surgical procedure using the International Index of Erectile Function (IIEF) scoring system.

RESULTS: The average age of the participants was 60.47 years, and the mean duration of BPH prior to surgery was 15.83 months. The mean IIEF score prior to surgery was 16.72, which notably decreased to 11.50 after surgery. This decline was statistically significant ($p < 0.001$), and this trend remained consistent across variables such as age, duration of BPH, and prostate volume.

CONCLUSION: The study concludes that TURP significantly correlates with a decline in EF among patients with BPH. These outcomes highlight the necessity for comprehensive preoperative counseling about the potential impacts on sexual health for patients considering TURP.

KEYWORDS: Prostatic Hyperplasia, Erectile Dysfunction, Prostatectomy, Sexual Health.

INTRODUCTION

Benign prostatic hyperplasia (BPH) is a prevalent condition, affecting an estimated 210 million men globally, representing a significant public health concern [1]. Characterized by the non-cancerous enlargement of the prostate gland, BPH commonly leads to lower urinary tract symptoms (LUTS), which can significantly impair the quality of life [2]. As men age, the incidence of BPH increases, making it a critical issue in geriatric healthcare.

Transurethral resection of the prostate (TURP) remains the gold standard surgical intervention for bladder outlet obstruction (BOO) secondary to BPH [3]. This procedure involves the removal of prostate tissue to relieve urinary symptoms. However, TURP is not without its complications, one of which is the potential impact on sexual function, a concern that has been increasingly recognized in urological research.

Sexual dysfunction following TURP primarily includes retrograde ejaculation, but its effect on erectile function (EF) remains controversial. While some studies have reported a decline in EF post-TURP [4], others have found no significant change or even an improvement [5]. This discrepancy highlights the need for further research in this area to better understand the implications of TURP on sexual health.

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The International Index of Erectile Function (IIEF) is a validated tool commonly used to assess erectile function, providing a quantifiable measure to evaluate post-surgical changes [6]. Investigating the impact of TURP on EF using the IIEF score can offer valuable insights into the sexual consequences of this common surgical intervention for BPH.

Given the prevalence of BPH and the frequency of TURP as a treatment modality, understanding the comprehensive range of postoperative outcomes, including the impact on EF, is essential for effective patient counseling and management. This study aims to provide a comprehensive analysis of the mean change in EF post-TURP in a tertiary care setting, contributing to the growing body of evidence in this clinically important field.

The relationship between BPH and sexual dysfunction extends beyond the surgical implications. BPH and associated LUTS have been independently associated with reduced sexual function in several studies [7]. This complex interaction is thought to be multifactorial, involving psychological, physiological, and hormonal factors. The presence of LUTS has been correlated with decreased libido, erectile dysfunction, and other sexual dysfunctions [8]. Therefore, when evaluating the impact of TURP on erectile function, it is important to consider the baseline sexual health status affected by BPH itself.

Moreover, the psychological impact of BPH and its treatment should not be underestimated. Men undergoing TURP may experience anxiety and stress related to both their urinary symptoms and concerns about potential postoperative complications, including sexual dysfunction [9]. This psychological burden can further compound the direct physiological effects of the surgery on erectile function. The use of the IIEF score in this context provides a more holistic understanding of the impact of TURP on sexual health, encompassing both physical and psychological dimensions.
Despite the widespread use of TURP, there remains a gap in the literature regarding its long-term effects on sexual function. This study aims to fill this gap by providing detailed perceptions of the changes in erectile function post-TURP. The findings from this study could have significant implications for patient counseling and decision-making. By understanding the potential risks and outcomes associated with TURP, healthcare providers can better inform patients about what to expect postoperatively and manage their conditions more effectively.
The relationship between benign prostatic hyperplasia (BPH) and erectile dysfunction (ED), particularly following transurethral resection of the prostate (TURP), has garnered significant attention in medical research. BPH, a common condition in older men, is often linked with lower urinary tract symptoms (LUTS) and impacts sexual function [10-11]. TURP, the standard surgical treatment for BPH, is effective for urinary symptoms but its effects on sexual health, including erectile function, are complex [4].

Early research indicated a negative impact of TURP on erectile function [5], but recent studies present a more nuanced view, with some reporting no change or even improvements after surgery. [6]. Variations in outcomes may be due to differences in surgical techniques, patient selection, and assessment methods [7]. The International Index of Erectile Function (IIEF) has been crucial in providing a standardized assessment of erectile function, leading to more reliable and comparative data [8].

Overall, the literature suggests a complex interplay between TURP and erectile function, with diverse outcomes reported across studies. This highlights the importance of thorough pre-operative counseling and careful post-operative monitoring of sexual function in patients undergoing TURP for BPH [9].

METHODOLOGY

The study adopted a descriptive methodology to investigate the effects of transurethral resection of the prostate (TURP) on erectile function. Labeled as ERC/BMC/53-2022, this research was carried out at Bilawal Medical College for Boys, LUMHS Jamshoro, from November 1, 2022, to April 30, 2023. The determination of the sample size was informed by Choi et al research, which observed pre-operative International Index of Erectile Function (IIEF) scores of 10.09±10.15 and post-operative scores of 7.79±8.52.

To attain a statistical power of 80% while maintaining a 5% significance level, the study required a total of 261 patients. For participant recruitment, the study employed a non-probability, consecutive sampling technique. This method facilitated the sequential inclusion of patients who fulfilled the specified criteria during the study timeframe.

The inclusion criteria include males aged between 50 to 70 years who have been diagnosed with Benign Prostatic Hyperplasia (BPH) and have been living with the disease for a period ranging from 6 months to 2 years.

The exclusion criteria are set to maintain the integrity of the study by eliminating potential confounding variables. Patients who have diabetes mellitus or vascular diseases are excluded due to the possible impact these conditions might have on BPH symptoms or treatment outcomes. Similarly, individuals with a history of surgeries affecting the bladder neck, prostate, or pelvic region are not eligible to participate, as such procedures could alter the disease's natural course or affect the study's findings. Additionally, the study excludes patients with prostate-specific antigen levels greater than 4 ng/ml and those with a prostate volume smaller than 45 ml or larger than 90 ml to ensure a focus on typical cases of BPH without extreme pathological deviations, facilitating more accurate and generalizable research outcomes.

Informed consent was duly obtained from all participants before initiating data collection. The pre-operative International Index of Erectile Function (IIEF) scores were gathered using a standardized and validated scoring proforma. Subsequent to the Transurethral Resection of the Prostate (TURP) procedure, post-operative IIEF scores were evaluated at a one-month follow-up. Additionally, comprehensive patient demographics and clinical profiles,

including variables such as age, duration of BPH, and prostate volume, were meticulously recorded for each participant.

The analysis of the collected data was conducted using the Statistical Package for the Social Sciences (SPSS), version 26.0. Descriptive statistical methods were employed to calculate means and standard deviations for continuous variables, including age, duration of BPH, prostate volume, and IIEF scores. Stratification was applied to adjust for potential confounding variables, focusing on factors such as age, duration of BPH, and prostate volume. A p-value threshold of less than 0.05 was set for determining statistical significance in the findings.

RESULTS

The outcomes of this investigation offer an in-depth assessment of the effects of transurethral resection of the prostate (TURP) on erectile function among individuals with benign prostatic hyperplasia (BPH). Through the analysis of data collected from 261 male subjects aged between 50 and 70 years, a notable alteration in the International Index of Erectile Function (IIEF) scores pre- and post-TURP was observed. These results provide critical insights into the sexual health consequences associated with this prevalent surgical treatment for BPH. They highlight the importance of comprehending the postoperative repercussions, particularly in the context of a patient's sexual well-being.

Table- I:Demographic and clinical characteristics of bph patients undergoing turp.

	Mean	Standard Deviation	Minimum	Maximum
Age of Patients (Years)	60.47	±5.43	50	70
Duration of BPH (Months)	15.83	±6.48	6	24
prostate Volume (ml)	64.12	±11.46	45	90

Table-I delineates the primary demographic and clinical attributes of the patient group involved. The data reveals that the mean age of patients undergoing transurethral resection of the prostate (TURP) is 60.47 years, with a standard deviation of ±5.43 years, spanning an age range from 50 to 70 years. This demographic profile predominantly represents a middle-aged to senior patient group, commonly afflicted by benign prostatic hyperplasia (BPH).

The study recorded an average duration of BPH symptoms of 15.83 months, with a standard deviation of ±6.48 months, and a range from 6 to 24 months. This indicates that most patients had been experiencing symptoms of BPH for a relatively short period before opting for surgical intervention.

Table-III of the study presents a detailed examination of the impact of age on the International Index of Erectile Function (IIEF) scores before and after surgery, across two distinct age groups.In the age bracket of 50-60 years, the average pre-operative IIEF score was 17.28, with a standard deviation of 5.74. Post-operatively, this score declined to an average of 11.87, with a standard deviation of 2.66. This decrease was found to be statistically significant, as indicated by a P-value of less than 0.001.

Similarly, for patients aged between 61-70 years, the initial average pre-operative IIEF score stood at 16.30, with a standard deviation of 4.90. Following surgery, this score dropped to an average of 11.22, with a standard deviation of 3.23. Again, this change was statistically significant, evidenced by a P-value of less than 0.001. These findings suggest that within the studied age range, age consistently influenced the decline in IIEF scores after undergoing transurethral resection of the prostate (TURP).

Additionally, the average prostate volume was 64.12 ml, with a standard deviation of ±11.46 ml, spanning a range from 45 to 90 ml. This suggests that the patient cohort generally had moderate to significantly enlarged prostates, which is a typical clinical indication for surgical procedures such as TURP.

Table- II:Descriptive statistics of pre-op and post-op IIEF score.

	Pre-op IIEF Score	Post-op IIEF	p-value
Mean	16.72	11.50	≤0.001
S.D	5.29	3.01	

Table 2 provides a concise statistical overview of the changes in the International Index of Erectile Function (IIEF) scores before and after undergoing transurethral resection of the prostate (TURP) among patients with benign prostatic hyperplasia (BPH). The data reveals a significant decline in the average IIEF score from a pre-operative mean of 16.72 (with a standard deviation of 5.29) to a post-operative mean of 11.50 (with a standard deviation of 3.01).

The statistical significance of this reduction is underscored by a p-value of less than 0.001, indicating a strong likelihood that the observed decrease in erectile function is directly associated with the TURP procedure. This significant change highlights the critical impact of TURP on sexual health, suggesting that patients and clinicians should weigh the benefits of symptom relief against the potential for diminished erectile function following surgery.

Table- III:Stratification of age to determine the effect of age on pre-op and post-op IIEF score.

Age Group	n(%)	Pre-op IIEF	Post-op IIEF	P-value
50-60 Years	131(50.2)	17.28±5.74	11.87±2.66	≤0.001
61-70 Years	130(49.8)	16.30±4.90	11.22±3.23	≤0.001

Table-IV:Stratification of duration of BPH to determine the effect of duration of BPH on pre-op and post-op IIEF score.

Duration of BPH	n (%)	Pre-op IIEF	Post-op IIEF	P-value
Duration of BPH 6-12 Months	131(50.2)	17.28±5.74	11.87±2.66	≤0.001
Duration of BPH >12 Months	130(49.8)	16.30±4.90	11.22±3.23	≤0.001

In Table-IV shows the study outlines the influence of the duration of benign prostatic hyperplasia (BPH) on the International Index of Erectile Function (IIEF) scores both before and after surgery.For the cohort of patients who had been experiencing BPH symptoms for a duration of 6-12 months, the average pre-operative IIEF score was recorded at 16.58, with a standard deviation of 5.07. This score experienced a reduction post-operatively, averaging at 10.98 with a standard deviation of 2.90. The statistical analysis revealed this change to be significant, as denoted by a P-value of less than 0.001.

In the group of patients with a BPH duration exceeding 12 months, the pre-operative IIEF score was slightly higher, averaging at 16.82 with a standard deviation of 5.46. Post-operatively, this score dropped to an average of 11.88, with a standard deviation of 3.04, and this decrease was similarly marked as statistically significant with a P-value of less than 0.001.These results clearly indicate that the duration of BPH has a significant impact on the reduction of IIEF scores following the transurethral resection of the prostate (TURP) procedure.

Table-V:Stratification of prostate volume to determine the effect of prostate volume on pre-op and post-op IIEF Score.

Prostate Volume	n (%)	Pre-op IIEF	Post-op IIEF	P-value
Mean Prostate Volume 45-60 ml	111(45.5)	16.19±4.72	11.37±3.15	≤0.001
Mean Prostate Volume 51-90 ml	150(57.5)	17.12±5.66	11.60±2.90	≤0.001

In Table-V the study delves into the impact of prostate volume on the International Index of Erectile Function (IIEF) scores both before and after the transurethral resection of the prostate (TURP) procedure. In the group with a prostate volume ranging between 45-60 ml, the average pre-operative IIEF score was reported as 16.19, with a standard deviation of 4.72. Following the TURP procedure, this score decreased to an average of 11.37, with a standard deviation of 3.15. The change in scores was statistically significant, as indicated by a P-value of less than 0.001.

For patients who had a larger prostate volume, specifically between 61-90 ml, the pre-operative IIEF score was slightly higher, averaging at 17.12 with a standard deviation of 5.66. Post-operatively, this score reduced to an average of 11.60, with a standard deviation of 2.90. The decrease in IIEF scores in this group was also statistically significant, as reflected by a P-value of less than 0.001. These findings suggest that prostate volume has a significant influence on the decrease in IIEF scores following the TURP procedure, indicating a notable correlation between prostate size and the extent of change in erectile function post-surgery.

DISCUSSION

This study found a significant decrease in International Index of Erectile Function (IIEF) scores following TURP in patients with benign prostatic hyperplasia (BPH).Our study demonstrated a notable decrease in IIEF scores following transurethral resection of the prostate (TURP), supporting the notion that TURP, while effective for BPH symptoms, adversely impacts erectile function. This aligns with prior research, though our study extends these findings by examining how age, BPH duration, and prostate volume influence this outcome [12].

Contrary to expectations, the age of patients did not significantly affect the degree of erectile function decline. This is an intriguing deviation from earlier studies that suggested older age might exacerbates the post-TURP sexual dysfunction. Our results could imply that age, within the range studied, may not be as critical a factor in post-TURP erectile function as previously thought [13]. Regarding BPH duration, our findings suggest its duration does not markedly alter erectile outcomes post-TURP. This observation challenges some earlier hypotheses and agrees with recent studies that downplay the duration of BPH symptoms as a significant factor in postoperative erectile function.

Finally, prostate volume's impact on erectile function post-TURP was notable, yet did not vary significantly between different volume ranges in our study. This finding is in line with other research [14], suggesting that while prostate size is a key factor in deciding TURP, it might not be a decisive factor for postoperative erectile function.

These insights contribute significantly to our understanding of TURP's impact on sexual health and underline the importance of patient counseling about potential sexual side effects. Further research is warranted to explore the mechanisms underlying these changes in erectile function and to develop strategies to mitigate them.

Overall, our study contributes to the growing body of evidence suggesting that TURP, while effective for alleviating urinary symptoms of BPH, has a significant impact on erectile function. These findings underscore the importance of thorough preoperative counseling regarding potential sexual side effects.

CONCLUSION

This study underscores a significant association between transurethral resection of the prostate (TURP) and a reduction in erectile function in patients with benign prostatic hyperplasia (BPH). The findings demonstrate that irrespective of age, duration of BPH, or prostate volume, patients undergoing TURP are likely to experience a notable decrease in erectile function. These results highlight the need for comprehensive preoperative counseling for patients regarding the potential impact on sexual health post-TURP. Future research should focus on identifying strategies to minimize this impact and improve overall quality of life for patients undergoing this common surgical procedure for BPH.

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Authors Contributions:

Farhan Khan: Substantial contributions to the conception and design of the work.
Naveed Soomro: Acquisition of data for the work.
Muhammad Adnan Sarwar: Drafting the work.
Muhammad Mashkoor Aslam: Analysis and interpretation of data for the work
Haider Ali Qureshi: Reviewing it critically for important intellectual content.
Hafiz Bilal Murtaza: Final approval of the version to be published.

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