International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 13, No. 7, July 2024 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_13.7.2024.43

**ORIGINAL RESEARCH**

# Comparison of 5α-Reductase Inhibitors Pre-Treatment Versus TURP Alone in Transurethral Resection of the Prostate (TURP): A Comparative Study

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Received: 25 May, 2024 Accepted: 30 June, 2024

## ABSTRACT

**Background:** Transurethral resection of the prostate (TURP) is a standard surgical intervention for benign prostatic enlargement (BPE). Pre-treatment with 5α-Reductase inhibitors has been suggested to optimize surgical outcomes by reducing prostate volume and vascularity. This study aimed to compare the outcomes of TURP in patients pre-treated with 5α-Reductase inhibitors for 3 months versus those treated with TURP alone. **Methods:** A prospective, randomized controlled trial was conducted involving 200 patients aged 50-80 years with symptomatic BPE requiring surgical intervention. Patients were randomized into two groups: Group A (n=100) received 5α-Reductase inhibitors (finasteride 5mg or dutasteride 0.5mg) daily for 3 months prior to TURP, while Group B (n=100) underwent TURP alone. The primary outcomes were intraoperative bleeding, postoperative complications assessed using the Clavien-Dindo classification, and improvement in International Prostate Symptom Score (IPSS) at 3 months postoperatively. **Results:** Group A demonstrated a significant reduction in intraoperative bleeding compared to Group B (150 ± 50 mL vs. 200 ± 60 mL, $p<0.001$). Postoperative complications were comparable between the two groups ($p=0.54$). Group A showed a more favorable improvement in IPSS compared to Group B at 3 months postoperatively (15 ± 5 vs. 12 ± 4, $p=0.002$). **Conclusion:** Pre-treatment with 5α-Reductase inhibitors significantly reduces intraoperative bleeding and improves short-term urinary symptoms in BPE patients undergoing TURP. However, this reduction in bleeding does not translate into a significant reduction in postoperative complications. Future studies with longer follow-up periods are required to assess the impact of 5α-Reductase inhibitors on long-term postoperative outcomes and complications.

**Keywords:** 5α-Reductase inhibitors, transurethral resection of the prostate (TURP), intraoperative bleeding, postoperative complications, International Prostate Symptom Score (IPSS).



## INTRODUCTION

Benign prostatic enlargement (BPE) is a prevalent condition predominantly affecting aging men, characterized by the non-cancerous enlargement of the prostate gland, leading to bothersome lower urinary tract symptoms (LUTS) [1]. These symptoms can significantly impact the quality of life, including urinary frequency, urgency, nocturia, and incomplete bladder emptying [1]. The progression of BPE can also lead to complications such as acute urinary retention, recurrent urinary tract infections, and bladder stones [1]. Transurethral resection of the prostate (TURP) has long been established as a standard surgical intervention for BPE, aiming to alleviate LUTS and improve the quality of life [5].

Over the years, various medical treatments have been explored to manage BPE and optimize surgical outcomes. 5α-Reductase inhibitors, such as finasteride and dutasteride, are among the pharmacological agents commonly used in the management of BPE. These agents inhibit the enzyme 5α-Reductase, which converts testosterone to dihydrotestosterone, a potent androgen responsible for prostatic growth [2]. By inhibiting this conversion, 5α-Reductase inhibitors reduce prostate volume, improve urinary symptoms, and potentially delay the progression of BPE [2].

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Several studies have evaluated the efficacy of 5α-Reductase inhibitors in combination with TURP to optimize surgical outcomes in patients with BPE. These studies have suggested that pre-treatment with 5α-Reductase inhibitors can reduce prostate size, improve surgical ease, and decrease perioperative bleeding during TURP [3,4]. However, the existing literature is limited and often inconclusive, necessitating further research to determine the optimal management strategy for BPE patients undergoing TURP.

TURP is an effective surgical procedure for BPE; however, it is associated with potential complications, most notably bleeding, which can lead to increased morbidity, prolonged hospital stay, and the need for blood transfusion [6]. Given the potential antiproliferative and anti-inflammatory effects of 5α-Reductase inhibitors on the prostate, it is hypothesized that pre-treatment with these agents could reduce intraoperative bleeding and improve postoperative outcomes in TURP.

Furthermore, the International Prostate Symptom Score (IPSS) is a validated tool commonly used to assess the severity of LUTS and the response to treatment in patients with BPE [8]. Improvements in IPSS following TURP reflect the efficacy of the surgical intervention in relieving urinary symptoms and improving the quality of life [8]. Therefore, evaluating the impact of 5α-Reductase inhibitors on IPSS improvement is essential to understand the overall benefits of pre-treatment with these agents in BPE patients undergoing TURP.

Despite the potential benefits of 5α-Reductase inhibitors in optimizing surgical outcomes in TURP, there is limited comparative research examining the efficacy of 5α-Reductase inhibitors in combination with TURP versus TURP alone.

## MATERIALS AND METHODS

### Study Design and Population

This was a prospective, randomized controlled trial conducted at tertiary care center between January 2023 and December 2023. The study was approved by the institutional ethics committee, and written informed consent was obtained from all participants. A total of 200 patients aged between 50 and 80 years with symptomatic BPE requiring surgical intervention were recruited. Patients were randomized into two groups using a computer-generated randomization sequence: Group A (n=100) received 5α-Reductase inhibitors (finasteride 5mg or dutasteride 0.5mg) daily for 3 months prior to TURP, while Group B (n=100) underwent TURP alone.

### Inclusion and Exclusion Criteria

Inclusion criteria were:

- Age 50-80 years
- Diagnosis of BPE with an indication for TURP
- Signed informed consent

Exclusion criteria were:

- Previous prostate surgery
- Contraindications to 5α-Reductase inhibitors (e.g., liver disease, prostate cancer)
- Severe coagulopathy or bleeding disorders
- Inability to provide informed consent

### Pre-Treatment with 5α-Reductase Inhibitors

Patients in Group A received 5α-Reductase inhibitors (finasteride 5mg or dutasteride 0.5mg) daily for 3 months prior to TURP. Compliance was assessed by patient self-reporting and medication pill counts during follow-up visits.

### Surgical Procedure

All TURP procedures were performed by experienced urologists using a standard resectoscope under spinal or general anesthesia. The amount of resected tissue, operative time, and intraoperative bleeding were recorded.

### Outcome Measures

The primary outcomes were:

1. Intraoperative bleeding: measured in milliliters using a calibrated suction apparatus.
2. Postoperative complications: assessed using the Clavien-Dindo classification [11].
3. Improvement in International Prostate Symptom Score (IPSS): assessed preoperatively and at 3 months postoperatively.

### Statistical Analysis

Data were analyzed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation and compared using the independent t-test or Mann-Whitney U test, as appropriate. Categorical variables were expressed as frequencies and percentages and compared using the chi-square test or Fisher's exact test. A p-value $<0.05$ was considered statistically significant.

Sample size calculation was based on a power analysis to detect a clinically significant difference in intraoperative bleeding between the two groups, with a power of 80% and a significance level of 0.05. A sample size of 100 patients per group was determined to be sufficient to detect a 20% difference in intraoperative bleeding between the two groups.

### Follow-Up

All patients were followed up at 1 week, 1 month, and 3 months postoperatively. During follow-up visits, IPSS was reassessed, and any postoperative complications were recorded.

## RESULTS

A total of 200 patients were enrolled in the study and randomized into two groups: Group A (n=100) received 5α-Reductase inhibitors (finasteride 5mg or dutasteride 0.5mg) for 3 months prior to TURP, while Group B (n=100) underwent TURP alone. The

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baseline characteristics including age, prostate volume, and IPSS were comparable between the two groups, as shown in Table 1.

**Table 1: Baseline Characteristics of Study Groups**

| Parameter | Group A (n=100) | Group B (n=100) | p-value |
|---|---|---|---|
| Age (years) | 68.5 ± 5.2 | 67.8 ± 4.8 | 0.23 |
| Prostate volume (cc) | 65.2 ± 12.3 | 64.8 ± 11.8 | 0.78 |
| IPSS | 22.6 ± 4.2 | 23.0 ± 4.0 | 0.52 |

**Intraoperative Parameters**

Group A demonstrated a significant reduction in intraoperative bleeding compared to Group B (150 ± 50 mL vs. 200 ± 60 mL, $p<0.001$), as shown in Table 2. The operative time was comparable between the two groups (45 ± 10 minutes in Group A vs. 44 ± 11 minutes in Group B, $p=0.67$).

**Table 2: Intraoperative Parameters**

| Parameter | Group A (n=100) | Group B (n=100) | p-value |
|---|---|---|---|
| Intraoperative bleeding (mL) | 150 ± 50 | 200 ± 60 | <0.001 |
| Operative time (minutes) | 45 ± 10 | 44 ± 11 | 0.67 |

**Postoperative Complications**

Postoperative complications were assessed using the Clavien-Dindo classification [11]. The incidence of postoperative complications was comparable between the two groups, with no significant difference in the Clavien-Dindo classification ($p=0.54$), as shown in Table 3.

**Table 3: Postoperative Complications**

| Complication grade | Group A (n=100) | Group B (n=100) | p-value |
|---|---|---|---|
| Grade I (minor) | 8 (8%) | 10 (10%) | 0.54 |
| Grade II (major) | 2 (2%) | 3 (3%) | 0.71 |
| Grade III (major) | 0 | 1 (1%) | 0.31 |

**Improvement in IPSS**

Group A showed a more favorable improvement in IPSS compared to Group B at 3 months postoperatively (15 ± 5 vs. 12 ± 4, $p=0.002$), as shown in Table 4.

**Table 4: Improvement in IPSS at 3 Months Postoperatively**

| Parameter | Group A (n=100) | Group B (n=100) | p-value |
|---|---|---|---|
| IPSS (3 months) | 15 ± 5 | 12 ± 4 | 0.002 |

## DISCUSSION

The primary objective of this study was to evaluate the efficacy of pre-treatment with 5α-Reductase inhibitors in reducing intraoperative bleeding and improving postoperative outcomes in patients undergoing TURP for BPE. Our findings demonstrate several key observations that merit discussion.

**Intraoperative Bleeding Reduction with 5α-Reductase Inhibitors**

One of the most significant findings of our study was the substantial reduction in intraoperative bleeding in patients pre-treated with 5α-Reductase inhibitors compared to those treated with TURP alone. The mean intraoperative bleeding was 150 mL in the pre-treated group versus 200 mL in the control group ($p<0.001$). This reduction in bleeding can be attributed to the antiproliferative and anti-inflammatory effects of 5α-Reductase inhibitors on the prostate tissue [3,4].

The prostate gland in BPE patients is characterized by increased vascularity and epithelial proliferation, leading to increased bleeding during surgical interventions like TURP [12]. 5α-Reductase inhibitors, by inhibiting the conversion of testosterone to dihydrotestosterone (DHT), reduce prostate volume and vascularity, thereby minimizing bleeding during surgery [2,4].

Our findings are consistent with previous studies that have reported a reduction in intraoperative bleeding with 5α-Reductase inhibitors. For instance, Kaplan et al. [3] demonstrated reduced bleeding and improved surgical visibility during TURP in patients pre-treated with doxazosin and finasteride. Similarly, Roehrborn et al. [4] reported decreased blood loss and improved surgical outcomes with dutasteride pre-treatment in men undergoing TURP.

**Postoperative Complications**

Despite the significant reduction in intraoperative bleeding, the incidence of postoperative complications

DOI: 10.69605/ijlbpr_13.7.2024.43

was comparable between the two groups. The Clavien-Dindo classification demonstrated no significant difference in minor (Grade I) and major (Grade II and III) complications between the pre-treated and control groups (p=0.54).

The lack of significant difference in postoperative complications may be attributed to the overall safety and efficacy of TURP as a surgical procedure. TURP is a well-established and effective surgical intervention for BPE, with low complication rates when performed by experienced urologists [5]. The reduction in bleeding achieved with 5α-Reductase inhibitors may not translate into a significant reduction in postoperative complications due to the other inherent risks associated with TURP, such as urinary tract infection, bladder perforation, and urethral stricture [13].

Furthermore, the short-term follow-up of 3 months in our study may not capture all potential postoperative complications, as some complications, such as urethral stricture, may manifest after a longer period [14]. Therefore, a longer follow-up period is required to assess the impact of 5α-Reductase inhibitors on long-term postoperative outcomes and complications.

### Improvement in IPSS with 5α-Reductase Inhibitors

Another significant finding of our study was the more favorable improvement in IPSS in patients pre-treated with 5α-Reductase inhibitors compared to those treated with TURP alone. At 3 months postoperatively, the mean improvement in IPSS was 15 ± 5 in the pre-treated group versus 12 ± 4 in the control group (p=0.002).

Improvement in IPSS reflects the efficacy of TURP in relieving LUTS and improving the quality of life in BPE patients [8]. The more favorable improvement in IPSS observed in the pre-treated group can be attributed to the additional benefits of 5α-Reductase inhibitors in reducing prostate volume and improving urinary symptoms [2,9].

Our findings are consistent with previous studies that have reported improved urinary symptoms and quality of life with 5α-Reductase inhibitors in BPE patients. Nickel et al. [2] demonstrated a greater improvement in IPSS and quality of life in patients treated with dutasteride compared to finasteride. Kaplan et al. [3] also reported improved urinary symptoms and quality of life in patients pre-treated with doxazosin and finasteride prior to TURP.

## CONCLUSION

In conclusion, pre-treatment with 5α-Reductase inhibitors significantly reduces intraoperative bleeding and improves short-term urinary symptoms in BPE patients undergoing TURP. However, this reduction in bleeding does not translate into a significant reduction in postoperative complications. Future studies with longer follow-up periods are required to assess the impact of 5α-Reductase inhibitors on long-term postoperative outcomes and complications.

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