



**ORIGINAL RESEARCH PAPER**

**Urology**

**EFFECT OF 5-ALPHA REDUCTASE INHIBITOR ON THE VASCULARITY OF BPH AFTER TURP**

**KEY WORDS:**

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**ABSTRACT**

**OBJECTIVE:** To assess the effects of 5- $\alpha$ -reductase inhibitor (finasteride) on vascularity of prostate in patients with BPH undergoing TURP by measuring preoperative and postoperative Hb by comparison with control cases.

**METHODOLOGY:** A total of 78 patients of Benign Prostatic Hyperplasia (BPH) planned for Trans-Urethral Resection of Prostate (TURP) having a prostate size of more than 50 grams on trans-abdominal ultrasonography and/or transrectal ultrasonography with PSA of less than 0.4 ng/dl was divided into 2 groups, each group having 39 patients. The finasteride group (Group A) was prescribed oral 5 mg of finasteride daily for 2 weeks before surgery. The Group B (Group B) did not. There was no significant difference in the mean age of patients, prostate volume, PSA and preoperative hereceive any agent. After 2 weeks, TURP was performed and variables were recorded.

**RESULTS:** moglobin level in both groups. There was significant reduction in mean blood loss, blood loss/time, and total blood loss per gram of resected tissue in finasteride groups compared with the other group. Besides these, amount of irrigation fluid used and duration of irrigation was more in the Group B.

**CONCLUSION:** The 5- $\alpha$ -reductase inhibitors (finasteride) reduces intraoperative and postoperative blood loss in patients with BPH undergoing TURP if given two weeks before surgery as well as decrease rate of blood transfusion, amount of irrigation fluid used and duration of irrigation needed to clear hematuria postoperatively.

**INTRODUCTION:**

Benign prostatic hyperplasia (BPH) is the leading cause of lower urinary tract symptoms (LUTS) among the aging male population affecting more than 50% of men above 60 years of age<sup>1</sup>. AUA guideline (2003) suggests an increase in the incidence of BPH worldwide and predicts by the age of 60 years, more than 50% of men will have microscopic evidence of the disease and by the age of 85 years, about 90% of men will be affected<sup>2</sup>. Transurethral resection of the prostate (TURP) remains the gold standard for patients with benign prostatic hyperplasia (BPH) that failed medical therapy. Perioperative hemorrhage is one of the major complications of TURP, and prolonged bleeding will lead to blood transfusion and clot retention<sup>3</sup>. Various drugs have been used to decrease prostatic blood flow. Finasteride, an antiandrogen, was the first 5- $\alpha$ -reductase inhibitor approved in the United States in 1992 for the treatment of BPH<sup>4</sup>. Finasteride is a type 2 5- $\alpha$ -reductase inhibitor and reduces prostatic vascularity by interacting with vascular endothelial growth factor (VEGF), which is an androgen-sensitive growth factor stimulating angiogenesis. Microvessel density (MVD) is a histological measurement of angiogenesis and thus a marker of bleeding. Studies have shown that BPH presenting with hematuria have a significantly higher MVD than BPH without hematuria, suggesting that MVD is a marker of vascularity and subendothelial microvessel proliferation may play an important role in mediating hematuria associated with BPH<sup>5</sup>. Emerging data have shown that finasteride treatment prior to TURP significantly decreases MVD in the prostate tissue<sup>6-10</sup>. Finasteride is well absorbed orally with an oral bioavailability of 63%. Total 40%-50% is metabolized in the liver, primarily by CYP3A4 to metabolites that are inactive and are eliminated through feces and urine. The half-life of finasteride is 6-8 hours and it is 90% bound to plasma

proteins<sup>11,12</sup>. The 5 mg dose was found to produce a marked improvement in symptom score, urinary flow rate, and prostate volume compared to that of placebo<sup>13,14</sup>.

**MATERIALS AND METHODS:**

Between June 2018 and May 2019, 78 patients were included in the study; patients were divided into 2 groups, Group B who did not receive any drugs before TURP and Group A who received finasteride 5 mg once daily for two weeks before surgery.

Patients underwent standard TURP in Department of Urology, PMCH, Patna. Recorded data included were pre-operative Hb level, amount of irrigation fluid used, hours of wash after TURP and blood transfusion rate. Analysis of the data was performed using SPSS (version 17).

**RESULTS AND DISCUSSION:**

There was no significant difference in the mean age of patients, prostate volume, PSA and preoperative hemoglobin level in both groups, however, significant difference was found for postoperative hemoglobin level with highly significant, in that postoperative hemoglobin was dropped more in Group B, and the rate of blood transfusion was more in the Group B (7% for the Group B while 1% for Group A) besides these, amount of irrigation fluid used and duration of irrigation was more in the Group B. Despite the minimally invasive nature of TURP, bleeding remains the most common complication of the procedure<sup>9,15,16</sup>.

Regarding the perioperative complications of TURP, besides sepsis, shock and post TURP syndrome, hemorrhage is the single most common complication, which may require a blood transfusion, return to operation room if severe, clot

retention and prolong hospital stay<sup>8</sup>. Bleeding associated with TURP depends on the preoperative use of finasteride, size of the prostate gland, length of the operation, and experience of the operating surgeon. Clot retention also depends on the quality and number of 3-way Foley's catheter used for irrigation<sup>17</sup>.

In our study, there is no statistically significant difference in baseline age, prostate volume, PSA or preoperative hemoglobin (Table 1). In the study done by Ozdal, et al., the intraoperative blood loss is calculated using the formula: Blood loss=(Irrigating fluid × Hb in irrigating fluid)/pre-op Hb It is 142.2 ± 18.7 ml in the finasteride group and 224.3 ± 52.7 ml in the Group B. Blood loss per gm of resected prostate is 8.76 ± 0.3 ml in finasteride group and 14.68 ± 1.5 ml in the Group B and are found to be statistically significant, but in our study we were depended on simple measurement of postoperative Hb 48 hours after operation to eliminate the bias of hemodilution due to fluid transfusion because of lack of facility.

**Table 1: Comparison of ages, prostate volume and PSA between Group A and Group B**

Groups	Age in yrs.	Prostate volume	PSA (ng/dl)
Group A	66.65 ± 1.52	48.39 ± 1.39	2.26 ± 0.12
Group B	69.33 ± 1.68	48.82 ± 1.50	1.95 ± 0.17

Table 2 shows a comparison of preoperative Hb and postoperative Hb between Group A and Group B in which there was a significant difference between postoperative Hb in both groups, there was a drop of Hb more in the Group B. A study by Donohue, et al., compared finasteride 5 mg daily with placebo for 2-weeks prior to TURP and found that there was significantly less mean blood loss in irrigation fluid in the finasteride group than in the Group B (43.6 gm versus 69.3 gm hemoglobin, p=0.011)<sup>15</sup>. The mean difference was more significant when blood loss per gm resected prostate was calculated (2.65 gm versus 4.65 gm hemoglobin per gm prostate. This less blood loss in the Group A may be explained by the fact that finasteride will decrease microvessel density in the prostate as in the research conducted by Donohue, et al<sup>15</sup>.

**Table 2: Comparison of preoperative Hb and post operative Hb**

Groups	Preoperative Hb (gm/dl)	Postoperative Hb (gm/dl)
Group A	14.00 ± 0.36	13.03 ± 0.31
Group B	13.60 ± 0.28	11.52 ± 0.25

Table 3 shows the comparison between blood transfusion rates between both groups with blood transfusion rate being more in the Group B.

**Table 3: shows comparison of blood transfusion rates between the groups**

Groups	Blood transfusion	No blood transfusion
Group A	1 (2.6%)	38 (97.4%)
Group B	7 (17%)	32 (83%)

**CONCLUSION:**

The 5- $\alpha$ -reductase inhibitors (finasteride) reduces intraoperative and postoperative blood loss in patients with BPH undergoing TURP if given two weeks before surgery as well as decrease rate of blood transfusion, amount of irrigation fluid used and duration of irrigation needed to clear hematuria postoperatively.

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