

Comparative Study of Role of Pre-operative Injection Tranexamic Acid in 80 Cases of Transurethral Resection of Prostate

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Abstract

Introduction: Transurethral resection of prostate (TURP) is a treatment of choice for obstructive urinary symptoms caused by senile enlargement of prostate even though its procedure is associated with complications such as blood loss and TURP syndrome. The short-term treatment with injection tranexamic acid (inj. TNX) reduces intraoperative blood loss and amount of irrigation fluid requirement as TNX accumulates in extracellular space of tissue where it inhibits tissue fibrinolysis. It also gives a better intraoperative vision, reduction of bladder wash and clot evacuation.

Objective: Assessment of intra- and post-operative blood loss during TURP along with the requirement of irrigation fluid, operative time, and clarity of vision.

Materials and Methods: All 80 patients were randomly divided equally into two equal Groups 1 and 2. All patients with moderate to severe bladder outlet obstruction with an international prostate symptom score of 13 or more and quality of life score of three or more were included in the study with written consent.

Observation: In both groups, patients were found between 51 and 60 years groups as SEP is a common condition affecting elderly men. Postoperatively clot retention found in only three patient out of 40 (7.5%) in Group 2. Blood loss is lesser in Group 1 than Group 2. The volume of irrigation is more required in control Group 2. Operative time is more in control Group 2 than TNX Group 1.

Conclusion: The significant advantage of using inj. TNX in reducing intraoperative blood loss, reducing volume of irrigation fluid required as well as the absorption of irrigation fluid concerned with TURP syndrome.

Key words: Hemocoagulation, injection tranexamic acid, Senile enlargement of prostate, Transurethral resection of prostate, Transurethral resection of prostate syndrome

INTRODUCTION

Senile enlargement of prostate (SEP) is a common condition affecting elderly men. Recently, newer medicinal therapy and minimal invasive therapies as transurethral resection of prostate (TURP), TURIS, TULIP and transurethral needle ablation have gained popularity for

the treatment of men with obstructive urinary symptoms. However, TURP is still the usual treatment of choice for these patients.¹⁻⁵

The main complications of TURP are bleeding and absorption of irrigation fluid (TURP syndrome). Factors that influence peri- and post-operative blood loss includes prostate size, weight of resected tissue, operating time, pre-operative urinary culture, pre-operative finasteride treatment, histological type of cancer, type of anesthesia, patient age, and blood pressure. TURP results in activation of coagulation and a consequent hypercoagulable state in the patient. Post-operative blood loss is thought to be associated with an increase in urinary fibrinolytic activity. Urine and urothelium contain high concentration of

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plasminogen activators that facilitate the lysis of clots. Therefore, administration of antifibrinolytic agents might be beneficial in reducing the amount of post-operative blood loss during TURP.⁶⁻¹²

In this study, we use pre-operative injection tranexamic acid (inj. TNX):

1. To assess the result of short-term treatment with inj. TNX in patient undergoing TURP for reducing the associated blood loss intra- and post-operative.
2. For assessment of reduction in the need of bladder wash, clot evacuation, and fulguration.
3. To compare inj. TNX versus control regarding operative time, clarity of vision, reduction in irrigation fluid requirement.
4. For assessment of reduction in need of blood transfusion.
5. Whether it helps in stabilization of patient on laboratory parameters.
6. To observe any adverse effects of the use of inj. TNX.

MATERIALS AND METHODS

To compare role of inj. TNX in controlling blood loss during TURP, a total of 80 patients were included in the study, and they were divided into two equal groups; each group of 40 patients. All males with moderate and severe bladder outlet obstruction with international prostate symptom score of 13 or more and quality of life score of three or more were included in the study. Patients having neurogenic bladder, prostate carcinoma, previous prostatic surgery, and bladder stones were excluded.

Group 1: TURP with inj. TNX.
inj. TNX (500 mg) one ampoule injected 30 min before operation and 500 mg after operation.

Group 2: TURP without inj. TNX.
Inj. TNX not given to the patient during operation.

In this study, hemoglobin (Hb), packed cell volume (PCV), and vitals are recorded preoperatively, after 30 min of operation and 24 h of operation. TURP operation was done by expert surgeons under general or spinal anesthesia. In the surgery, electrocautery was used cutting at 80 W and coagulation at 70 W. Intra- and post-operative patient was observed for any kind of drug reaction such as hypotension, dizziness, and thromboembolic phenomenon. Intraoperative blood loss was calculated by following method:

Patient having normal blood volume assume 5 L so 5000 mL blood contains... g Hb.

Total Hb of irrigation fluid is = (irrigation fluid ml) (conc. of Hb in collected sample)/100 =..... in g.

Net total blood loss in irrigation fluids = 5000 (irrigation fluid Hb)/total body Hb =.....in ml.

Fall of Hb after operation was calculated by comparing pre-operative Hb with immediate post-operative Hb and 24 h after operation Hb. Pre- and post-operative Hb, PCV, of patient and irrigation fluid were done in central pathology laboratory in the same machine. The patients were in follow-up for 3 months.

RESULTS

In this study, 80 cases of SEP were taken for TURP after randomization in two groups. Maximum patients were found between 51 and 60 years group as SEP is a common condition affecting elderly men. The incidence of associated other medical conditions such as diabetes and hypertension was 17.5% in Group 1 and 20% in Group 2. Clot retention found in only three patient out of 40 (7.5%) in Group 2 and none in Group 1. Mean Hb of Group 1 is 11.16 while mean Hb of Group 2 is 11.13.

Table 1: Observations and comparison

Variable	My study			"Antti Rannikko, Anssi Petas and Kimmo Taari" study		
	TNX (Group 1)	Control (Group 2)	P value	Group 1	Control (Group 2)	P value
Age (year)	56.86±6.09	57.23±5.40	0.44	71 (67-76)	68 (63-75)	0.095
Pre-operative Hb	11.16±1.47	11.13±1.47	0.92			
Prostate size (g)	38.07±3.83	38.27±3.91	0.83	50 (35-61)	51 (40-66)	0.174
Operative blood loss (ml)	124.6±8.45	141.05±12.17	<0.00001	128 (43-338)	250 (95-500)	0.018
Blood loss per g of resected tissue (ml/g)	5.47±0.88	5.95±1	<0.05	8 (4-17)	13 (7-22)	0.020
Volume of irrigation fluid required (L)	14.8±1.71	15.52±2.07	<0.10	15 (8-21)	18 (12-30)	0.004
Weight of resected tissue (g)	22.87±2.81	24.05±3.21	>0.05	16 (9-24)	16 (10-25)	0.415
Operative time (min)	73.37±8.54	74.32±8.77	0.31	36 (19-52)	48 (32-73)	0.001
Fall in Hb after surgery (g/L)	0.81±0.17	0.83±0.16	0.589	-	-	-
Fall in Hb after 24 h (g/L)	1.33±1.26	1.13±0.189	0.322	-	-	-

Hb: Hemoglobin, TNX: Tranexamic

In Group 1, 40% patient having ≤ 120 ml blood loss while 45% patient of control group having >130 ml of blood loss and more than 140 ml blood loss (30%) seen only in Group 2. Around 50% patients were having prostate size of (36-42 cc) in both Groups. Mean of Group 1 and Group 2 are 38.07 and 38.275, respectively. Mean of (weight of resected tissue) of Group 1 is 22.87 g and of Group 2 is 24.05 g. In both Groups, fall of Hb after 24 h was almost same. The volume of irrigation is more required in control Group 2 than TNX Group 1. Operative time is more in control Group 2 than TNX Group 1.

DISCUSSION

The TNX Group 1 and Control Group 2 were comparable in age, pre-operative Hb and prostate size. A strong correlation was observed in the amount of surgical blood loss and requirement of irrigation fluid volume, resected tissue weight. During TURP. Group 2 had significantly less bleeding than the control group (mean 12.6 ml vs. 141.05 ml). Post-operative TURP associated blood loss has been correlated with an increase in urinary fibrinolytic activity. Administration of antifibrinolytic drugs may be beneficial in reducing post-operative bleeding. The difference in blood loss between the two groups was still statistically significant (mean 5.47 ml/g vs. 5.95 ml/g, $P < 0.05$). Inj. TNX reduced the operative time and volume of irrigation fluid used. In our study, we have not encountered with any drug reaction and thromboembolic phenomenon.^{11,14-17}

In our study, mean age 57 years while 68 years mean age of “Antti Rannikko, Anssi Petas and Kimmo Taari” study. In both studies, pre-operative Hb, prostate size, weight of resected tissue was almost same in both groups.

In our study, we found a significant difference in intraoperative blood loss in control group in comparison to “Antti Rannikko, Anssi Petas and Kimmo Taari” study.

In our study, intraoperative irrigation fluid requirement, blood loss per gram of resected tissue is less comparison to “Antti Rannikko, Anssi Petas and Kimmo Taari” study. Operative time is almost same in both Groups in my study, but it was significantly less in treatment Group in “Antti Rannikko, Anssi Petas and Kimmo Taari” study. We did not observed any indissoluble intravesical blood clots in our study that would hamper surgery as mentioned in literature.²⁰ We did not observed any thromboembolic complication In our study but controlled clinical trial are not ideal for detecting rare drug-related adverse events.^{10,11,14,15} There was no need of blood transfusion required in our study.

CONCLUSION

Administration of antifibrinolytic drug may be beneficial in reducing post-operative bleeding.¹⁸ However, the effect of short-term treatment with inj. TNX on the incidence of secondary hemorrhage remains to be investigated.

The frequency of TURP Syndrome varied from 0.18% to 10.9% in recent studies.^{13,19,21-23}

The advantage of using inj. TNX is significantly reduction in the volume of irrigation fluid requirement as well as the absorption of irrigation fluid concerned with TURP syndrome. Still large pool of patients is required to detect any statistically significant differences.

In our study, the short-term treatment significantly reduces the surgical bleeding during TURP. Additional studies as needed to investigate to reduce blood loss in prostatic surgery as TURIS, Holmium laser evaporation of prostate, the blood transfusion rate and other objectively measurable clinical parameters.

SUMMARY

Inj. TNX is very useful in TURP as it reduces blood loss, reduces the need of bladder wash, clot evacuation, and fulguration. It helps during resection by way of clarity of vision. It is cost effective as it reduces the volume of irrigation fluid, prevention of TURP syndrome.

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