



## EFFICACY OF PROPHYLACTIC INTRAVENOUS TRANEXAMIC ACID IN HYSTERECTOMY

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### ABSTRACT

**Background:** Hysterectomy is one of the frequently performed major gynecological surgical procedures for various uterine pathologies. Tranexamic acid has already proven to reduce the uterine blood loss in non-surgical aspect. Various studies had revealed that Tranexamic acid resulted in a significant reduction of menstrual blood loss in menorrhagic women while not increasing the risk of thrombosis and had been used successfully to treat menorrhagia associated with a number of coagulopathies **Material and Methods:** This prospective study conducted on 50 women in Department of Obstetrics and gynaecology at kamineni institute of medical sciences ,narketpalle for one year period. They were divided in two groups: Cases: (n=25; women receiving prophylactic Tranexamic Acid 1g) and Control: (n=25). Estimated the amount of blood loss during surgery, need for blood transfusion , postoperative hemoglobin and incidence of adverse events were noted **Results:** Most common age group among Cases and Control was 46-55years [40% vs. 48%]. Age among. Post operative hemoglobin level was significantly higher among Cases( $9.77 \pm 0.55$ ) as compared to Controls ( $8.24 \pm 1.43$ ). Comparing post operative complications revealed that among both the groups post operative complications were comparable. The mean estimated blood loss in the case group and study group was  $400.16 \pm 107.1$  and  $580.44 \pm 110.9$  respectively **Conclusion:** Prophylactic treatment with TA in relation to benign hysterectomy reduces the overall total blood loss and transfusion requirements

**KEYWORDS :** Hysterectomy , Intravenous, Prophylactic ,tranexamic Acid

### INTRODUCTION

Hysterectomy is one of the frequently performed major gynecological surgical procedures for various uterine pathologies. Even when the indication for the procedure is benign, relatively high complication rates have been reported.

And the most common cause of complications is perioperative bleeding. Surgery affects the coagulation systems and consequent to the increased release of plasminogen activator inhibitor, the fibrinolytic system shuts down, thus leading to coagulopathy and bleeding [1].

In a woman with severe anemia or cardiovascular disease, a blood loss of as little as 200 mL may be life-threatening and require additional intervention [2].

As reported by Global nutrition report 2017 the burden of anemia in India is alarming and majority of women presenting for hysterectomy are already anemic. The perioperative blood loss puts the anemic women at risk of death and also increases the recovery time. Due to prevalence anemia, perioperative blood transfusion become more of an additional requirement in patients [3]

TXA has already proven to reduce the uterine blood loss in non-surgical aspect. Various studies had revealed that TXA resulted in a significant reduction of menstrual blood loss in menorrhagic women while not increasing the risk of thrombosis and had been used successfully to treat menorrhagia associated with a number of coagulopathies [4].

TXA gained worldwide recognition and acceptance in the 2010 Clinical Randomization of an Antifibrinolytic in Significant Hemorrhage (CRASH-2) trial, a multinational randomized placebo-controlled trial of TXA in adult trauma patients with significant bleeding [5].

Absolute contraindications for Tranexamic acid include hypersensitivity to the drug, pre-existing active thromboembolic disorder, disseminated intravascular

coagulation, renal failure, coronary or vascular stent placed within one year, acquired defective colour vision and acute subarachnoid hemorrhage. Relative contraindications include uncontrolled seizure disorder, renal dysfunction, high risk of venous or arterial thrombosis, or pre-existing coagulopathy or anticoagulant treatment [6].

### MATERIALS AND METHODS

This prospective study conducted on 50 women in Department of Obstetrics & Gynaecology at kamineni institute of medical sciences for one year period from January 2019 to December 2019. They were divided in two groups: Cases: (n=25; women receiving prophylactic intra venous 1gram Tranexamic Acid) and Control: (n=25).

### INCLUSION CRITERIA

Hysterectomy for any benign indication including but not limited to dysfunctional uterine bleeding, uterine fibroids, adenomyosis, pelvic inflammatory disease, adnexal mass or endometriosis.

Hysterectomy in combination with unilateral/bilateral salpingectomy or oophorectomy, ovarian cystectomy.

### EXCLUSION CRITERIA

Family history of thromboembolism, thrombophilia, previous or active thromboembolic disease, malignant disease

Patients on anti coagulant drugs, ascites and ovarian cyst which may likely to rupture/rupture during surgery

History of hypersensitivity to tranexamic acid

Patient currently undergoing treatment for any type of cancer

History of myocardial infarction within last year ,present unstable angina or severe coronary artery disease

### METHODOLOGY

The clinical history and the relevant investigations were noted. To achieve a minimum hemoglobin of 10 g/dL before

surgery, Packed red blood cell concentrate (PRBC) was transfused preoperatively in needed patients.

Hemoglobin measurements were repeated on the previous day of surgery in the hospital laboratory. Prior to the day of surgery, anesthesiologists had evaluated all the patients. The patients were advised fasting as per ASA guidelines.

All patients had standard premedications. On arrival in the theatre, twelve-lead ECG (leads II and V5) for heart rate (HR) and ST segment changes, Pulse oximetry (SpO2), and non-invasive blood pressure monitors were attached

The patients in the case group received prophylactic intravenous tranexamic acid 1gram before skin incision

All the surgeries were performed by experienced gynaecologists

The mean arterial blood pressure was maintained during surgery. The placement of drains was allowed but not encouraged. Following surgery, the patients were transferred to post-anesthesia care unit for further observation.

Postoperative hemoglobin was ascertained at 24 hours. All the patients were closely observed for signs and symptoms of thromboembolic phenomena and other adverse events

**Calculation of blood loss :**

Intra-operative blood loss was estimated by gravimetric method.

Drapes (4), sponges (20), abdominal pads (5) were weighed beforehand.

At the end of the surgery, the drapes, sponges, gauze were weighed again in an weighing machine. Difference in weight was noted. One mg weight was taken as equivalent to 1ml of blood.

Blood loss during surgery was measured as follows. Amount of blood loss (ml) = (weight of sponges, pads and drapes after surgery – weight of sponges, pads and drapes prior to surgery) + amount of blood collected in suction container

**OBSERVATION AND RESULTS**

**Table no 1 ; Age wise distribution**

AGE(YEARS)	Cases(%)	Controls(%)
25-35	2(5)	1(4)
36-45	9(36)	8(32)
46-55	10(40)	12(48)
>55	4(16)	3(12)
Total	25	25

In the table no 1 most common age group among cases was 46-55years (40%vs 48%)

Second most common group was 36-45 years (36%vs 32%)

**Table no 2: Parity wise distribution**

Parity	Cases(%)	Controls(%)
Nulliparous	1(4)	2(8)
Multiparous	24(96)	23(92)
Total	25	25

In the above table most patients were multiparous in cases and control groups (96%vs 92%)

**Table no 3: Comparing preoperative haemoglobin**

Haemoglobin(gm/dl)	Mean	Standard deviation
cases	10.09	0.67
controls	10.21	0.83

Preoperative hemoglobin was comparable between both groups

(10.09±0.67) in case and (10.21±0.83) in control group

**Table no 4 :Based on preoperative blood transfusions**

Study group	Preop transfusions (no of patients)	%
Cases	4	16
Controls	5	20

To achieve a minimum hemoglobin of 10g/dl before surgery

16% of cases and 20 % controls had preoperative 1 PRBC blood transfusion

**Table no 5 :Indications for hysterectomy**

Indication	Cases(%)	Controls(%)
Fibriod	2(8)	4(16)
Adenomyosis	3(12)	2(8)
Abnormal uterine bleeding	12(48)	10(40)
Endometriosis	2(8)	4(16)
Adnexal masses	3(12)	2(8)
Prolapse	3(12)	3(12)
Total	25	25

In table 5 the number of patients in each group of indications for hysterectomy were comparable

The preoperative characteristics in both the groups were similar and comparable

**Table no 6: Comparing surgery performed**

Hysterectomy	Cases(%)	Controls(%)
Abdominal	9(48)	11(44)
Laparoscopic	12(36)	7(28)
NDVH	2(8)	2(8)
Vaginal hysterectomy	2(8)	5(20)
TOTAL	25	25

Most common surgery performed in cases was laparoscopic hysterectomy and abdominal hysterectomy in controls

**Table no 7: Comparing intraoperative blood loss**

Characteristics	Cases(%)	Control(%)
Estimated blood loss		
<500ml	18(72)	12(48)
>500ml	7(28)	13(52)
Total	25	25

Based on the above table calculated intraoperative blood loss is < 500ml in 72% of cases

Blood loss is > 500ml in 52% of controls

**Table no 8 Comparing post operative haemoglobin**

Post operative hemoglobin	Mean	Standard deviation
cases	9.77	0.55
Control	8.24	1.43

Post operative hemoglobin was significantly higher in cases compared to control group and p value <0.001 was found to be statistically significant

**Table no 9:Outcomes**

Characteristics	cases	controls
Estimated Blood loss (ml)	400.16±107.1	580.44±110.9
Post operative Hemoglobin(gm/dl)	9.77±0.55	8.24±1.43
Postoperative blood transfusions	3(12%)	6(24%)

- The mean estimated blood loss in the case group and study group was 400.16±107.1 and 580.44±110.9

respectively

- Thus ,there was a significant reduction in in the mean bloodloss in case group when compared to study group and the difference was statistically very significant p value <0.001

**Table no 10: Incidence of adverse events**

Adverse events	Cases(%)	Controls(%)
Nausea	4(16)	2(8)
Vomiting	1(4)	1(4)
Diarrhoea	4(16)	3(12)
Thromboembolic phenomena	0	0
Seizures	0	0
Visual disturbances	0	0

- There was insignificant incidence of minor adverse effects like nausea, vomiting and diarrhoea in both the groups. None of the patients in both the groups developed any major adverse events, followed up to three days postoperatively

**DISCUSSION**

- Massive bleeding after surgical interventions or severe trauma continues to be one of the most frequent life-threatening emergencies. Trauma-associated hemorrhagic shock is the most frequent cause of avoidable deaths, with hyperfibrinolysis (HF) at the time of hospitalization having been identified as an independent predictor of mortality (Pabinger I, 2017) [7]
- The vast majority of the hysterectomies were performed by a senior gynecologist assisted by a resident under training, but no data concerning the surgeon's experience were collected.
- Most common age group among Cases and Control was 46-55 years [40% vs. 48%]. In a similar study by Shady NW *et al.*, (2018) [9] reported that there was no significant difference between the control and Case group with respect to their age
- In present study preoperative hemoglobin level were comparable among the study groups(10.09±0.67) in case and (10.21±0.83) in control group
- Shady *et al.*, (2018) [9] studied 105 women and reported that preoperative hemoglobin was comparable in all the groups
- In present study the postoperative hemoglobin levels were significantly higher in TXA treated group when compared to the control group (9.77 versus 8.24 g/dL).
- Shaaban *et al* had also reported significantly lower postoperative hemoglobin levels in the placebo
- Shady NW *et al.*, (2018) [9] showed no significant difference between the three groups (Control, IV and Topical Tranexamic Acid Group) related to their post-operative hemoglobin (p=0.752).
- In agreement to present study Bhavana G *et al.*, (2016) [10] reported that drop in post operative hemoglobin in study group (preoperative;11.2±1.28, post operative; 10.5±1.25) was not significant where as in control group(preoperative;11.1±1.24, post operative; 9.9± 1.14) was significant.
- In present study comparing the number of post operative blood transfusion given to both the groups revealed that Control group 6 (24%) has received more blood transfusions as compared to case 3 (12%)
- Shady NW *et al.*, (2018) [9] studied 105 women and

reported that the incidence of blood transfusion was increased in control group, 19 (54.3%) patients compared with 6 (17.1%) patients in group II (IV Tranexamic acid), and 7 (20%) patients in group III (Topical Tranexamic Acid)

- In present study, blood loss was higher among Control group (580.44±110.9) as compared to Cases (400.16±107.1) (p<0.001). Similar results were depicted by BhavanaG *et al.*, (2016) [10] who did a randomized controlled trial among 200 term women and reported mean blood loss of 511.3±164.456 ml in TA group vs. 637.9±429.77ml in control group.
- Topsoee *et al*[8] in their study on effects of prophylactic TXA treatment in patients undergoing benign hysterectomy had demonstrated significant reduction in perioperative blood loss in TXA treated group.
- Similar observation was made by Shaaban *et al* in their study on the efficacy of TXA in reducing blood loss in patients undergoing open myomectomy.
- In present study comparing post operative complications revealed that among both the groups post operative complications were comparable
- In agreement to present study findings post operative complications reported by Shady *et al.*, in both Control and Tranexamic acid group in terms of the incidence of nausea, vomiting, and diarrhea were comparable (Shady NW *et al.*, 2018) [9].
- Present study has few limitations. First cross sectional nature of the present study was the main limitation which restricts the use of present study findings to large population. Second is the small sample size; a large randomize clinical trial is required to strengthen the present study findings

**CONCLUSION**

- A single prophylactic dose of TXA given immediately before surgery seems to be a cost-effective way of reducing the blood loss, transfusion rate significantly in patients undergoing abdominal hysterectomy for benign indications.
- With proper attention to the contraindications, Tranexamic acid may be safely recommended as standard prophylactic treatment in abdominal hysterectomy especially in developing countries like India
- No incidence of thromboembolic events or death was observed in any of the groups.
- Further extensive studies are needed to validate our findings

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