IJBPAS, January, 2021, 10(1): 155-158

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

REDUCING BLOOD LOSS DURING ABDOMINAL HYSTERECTOMY WITH INTRAVENOUS VERSUS TOPICAL TRANEXAMIC ACID

SWETHA T[1], YASODHA S[2*] AND JEEVAHASHINI S[3]

1: Assistant Professor, Department of OBG, Sri Lakshmi Narayana institute of Medical Sciences, India

2: Associate Professor in OBG, Bharath Medical College and Hospital, Chennai.

3: CRRI, Sri Lakshmi Narayana institute of Medical Sciences, India

***Corresponding Author: Dr. Yasodha S: E Mail: yasodhaananthan@gmail.com**

Received 19th Oct. 2020; Revised 18th Nov. 2020; Accepted 14thDec. 2020; Available online 1st Jan. 2021

https://doi.org/10.31032/IJBPAS/2021/10.1.1021

ABSTRACT

Objectives: To assess the effect of Intravenous versus Topical Tranexamic acid in reducing the intra-operative and post-operative blood loss in abdominal hysterectomy surgeries. Materials and methods: In a randomized double-blind placebo-controlled trial, 105 women undergoing abdominal hysterectomy were randomly assigned to three groups: group 1 [35 patients received 110 ml normal saline IV just before skin insion], group 2 [35 patients received 1 g tranexamic acid (2 ampoules of kapron 500 mg 5 ml Amoun company) IV just before skin in scion] and group 3 [35 patients received 2 g topical tranexamic acid (4 ampoules of kapron 500 mg 5 ml) applied intra abdominally after hysterctomy. The primary outcome was intra-operative, postoperative and all blood loss estimation. Results: Both Group II (IV tranexamic acid) and Group III (topical tranexamic acid application) showed great reduction in intraoperative and post-operative blood loss (blood in the intraabdominal drain) compared with Group I (placebo group), (P = .0001, 0.0001, 0.0001, 0.0001), so the overall estimated blood loss in group II and III showed highly reduction compared with group I (P = .0001, .0001). Conclusion: Intravenous and Topical Tranexamic acid application safe and reliable method to help decrease blood loss during and after hysterectomy.

Keywords: Tranexamic acid, hysterectomy, blood loss

INTRODUCTION

Hysterectomy is the most common major surgical procedure performed in worldwide. The technique and route of delivery of the uterus depend on a combination of factors like anticipated pathology, the patient's body habitus, and the degree of pelvic relaxation, the need for concurrent abdominal and vaginal procedures, and the expertise of the surgeon. Hysterectomy can be performed in different ways. Types are abdominal and vaginal. A transverse (pfannenstiel) incision is made through the abdominal wall, usually above the pubic bone, as close to the upper hair line of the individual's lower pelvis as possible, similar to the incision made for a caesarean section. The recovery time for an open hysterectomy for an open hysterectomy is 4-6 weeks and sometimes longer due to the need to the cut through the abdominal wall **[1]**.

The risk of bleeding depends on the number, the size and the severity of the disease. Recently, attention has focused on the use of tranexamic acid to reduce blood loss. Tranexamic acid is an anti-fibrinloytic agent better known to gynaecologists for topical use as a treatment of menorrhagia to reduce blood loss. Topical application of tranexamic acid provides a high drug concentration at the site of the wound and a low systemic concentration **[2]**.

Tranexamic acid works by slowing down the breakdown of blood clots, which helps to prevent prolonged bleeding. It belongs to a class of antifibrinolytics. The tablets work by helping the blood in the womb to clot. Tranexamic acid tablets are usually taken thrice a day for a maximum of 4 days.

In the view of limited, good-quality evidence available to inform on best practices for prevention of bleeding during abdominal hysterectomy our study aimed at the evaluating role of adjunctive IV versus topical tranexamic acid application for prevention of hemorrhage in women with abdominal hysterectomy.

MATERIALS AND METHODS

Study inclusion criteria were woman undergoing total abdominal hysterectomy (TAH) with or without bilateral salphingo oophorectomy (BSO)

Exclusional criteria were patients with cardiac, hepatic and renal disease and patient with endometrial or cervical cancer. Patients allergic to tranexamic acid are excluded.

Randomization

Patients were randomized to three groups, each compromised of thirty- five patients according to a three blocked randomization list which was coded (1 or 2 or 3) at 1:1:1 ratio. The three parallel groups were prepared using a computer – generated randomization system. The allotted groups will be concealed in serially numbered sealed opaque envelopes that will only be opened after recruitment. The patient allocation will be performed prior to the induction of anesthesia by an independent person, who will not otherwise be involved in this study. The trial will be appropriately blinded; the participants, outcome assessors and the surgeons performing the procedure will be blinded to the medication type, which will be used.

Statistical Analysis

Qualitative data were described as numbers and percentages. Chi- square test was used for comparison between groups **(Table 1)**.

Table 1

CHARACTERISTICS	GROUP-1	GROUP-2	GROUP-3
Age(year)	35.54±4.03	35.46±4.6	35.8±4.7
weight	68.09±7.4	68.09±6.74	68.11±7.05
Height (kg)	162.6±4.37	163.9±4.5	163.57±4.7
BMI	25.69±2.21	25.33±2.21	25.43±2.22
Uterine size (week)	20.63±3.65	20.91±3.67	20.8±3.67

RESULTS

According to the study among 105 women. Group 1: received 1g normal saline before skin incision. Group 2: received 1g tranexamic acid IV before skin incision and Group 3: received 2g oral tranexamic acid application after hysterectomy **(Table 2)**.

Therefore, there is a no statistical difference between group 2 and group 3. The analysis is not significant.

Finally, no significant difference between the three groups.

Table 2

variables	Group-1 (n=35)	Group-2 (n= 35)	Group-3 (n=35)
Intra-operative blood loss	982.68±118.36	658.43±204.04	623.71±20
Post operative blood loss	97.14±14.05	63.29±11.24	60±13.06
Total blood loss	1080±126.07	721.71±211.78	683.71±21

DISCUSSION

Damage of the endothelial surface during surgery activates the hemostatic system, leading to elevated levels of plasminogen activator. This leads to fibrinolysis, causing destabilization of the fibrin network in blood clots. Elevated levels of plasminogen activator can maintain and

prolong bleeding during surgery **[3]**. This is of interest in gynecologic surgery because the level of fibrinolysis seems to be naturally high in myometrium. The endometrium and the cervical glands of the uterus. Furthermore, women with menorrhagia have even higher levels of plasminogen activator and plasma **[4, 5]**. Because menorrhagia is one of the most common indications for hysterectomy, these women could have an increased risk of bleeding complications when undergoing uterine surgery. To the best of our knowledge, this research was the first to examine the effect of intravenous versus topical tranexamic acid in reducing blood loss during abdominal benign hysterectomy. Our results indicate that both the intravenous and topicaltranexamic acid reduces the overall blood loss.

The TA group showed a lower amount of blood loss (407ml) when compared to control group (677ml;$p<0.1$). Treatment with TA resulted in decrease in risk of perioperative blood loss by 40%. In the study group, 13(19.7%) patients required blood transfusion in contrast to 23(34.8%) patients in the control group ($p<.01$).

TA is an anti-fibrinolytic agent approved for treatment of various types of haemorrhage. It inhibits fibrin degradation, thereby promoting the blood's ability to form stable blood clots.

CONCLUSION

We can conclude that intravenous and topical tranexemic acid safe reliable method to help decrease blood loss during abdominal hysterectomy.

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