

ORIGINAL ARTICLE

Determining Efficacy of Tranexamic Acid in Reducing Post Partum Haemorrhage in Elective Cesarean Section Patients Evaluating in Reference to Fall in Haemoglobin

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ABSTRACT

Obstetrical haemorrhage is a potentially fatal clinical manifestation of either vaginal delivery or caesarean section. According to reports, it is responsible for almost fifty percent of all pregnancy-related deaths. The prevalence of caesarean section (CS) has dramatically upped in both low income as well as in developed nations, thereby increasing the likelihood of obstetrical haemorrhage. The rationale of this study is that it is important to evaluate the efficacy and safety of TA on blood loss with LSCS.

Methods: Cases were separated into two subgroups: case: (A) and control: (B). In the operating theater, participants were given A and B packages to choose from, the contents of whom were only known to the nurse in charge of drug preparation. All meds were injected by an anesthetist who was not in charge of supervising or assessing the patients.

Results: Comparison of both %age reduction in Hb levels (>10%) after treatment shows that in Group A 6(20%) and in Group B 15(50%) had >10% reduction in Hb levels after treatment, p-value=0.015.

Conclusion: TA administration reduced dramatically the bleeding throughout CS, the proportion of patients who lost more than 1000 mL of blood, and the requirement for supplemental uterotonic substances. As a result, TA can be employed very safely and successfully in patients receiving caesarean section.

INTRODUCTION

Obstetrical haemorrhage is a potentially fatal clinical manifestation of either vaginal delivery or caesarean section. According to reports, it is responsible for almost fifty percent of all pregnancy-related deaths. The prevalence of caesarean section (CS) has dramatically upped in both low income as well as in developed nations, thereby increasing the likelihood of obstetrical haemorrhage. Despite significant advances in the detection and management of obstetrical haemorrhage in past few years, mortality rates from PPH persist fairly frequent in some countries around the globe. It is essential to minimize excessive bleeding in caesarean section and vaginal delivery to decrease the frequency of major illness and death due to obstetrical haemorrhage (1).

Tranexamic acid (TA), an antifibrinolytic agent, may impose coagulation cascade by blocking plasminogen activation to plasmin (2). Its reliability and effectiveness in limiting haemorrhage and trying to lower transfusion demands in numerous planned surgical procedures have been well established (2). TA has recently been shown to reduce haemorrhage in gynaecology illnesses like menorrhagia, hysterectomy, and myomectomy. Numerous researches examined the use of TA administration in caesarean section and found it to be effective (3, 4).

Studies have shown that no particular safety concerns on the use of this antifibrinolytic agent (5). Kafayat H, et al reported that the average expected hemorrhage in group A (Tranexamic acid administered) was 711.78 ± 20.89 and the average expected haemorrhage in group B (Tranexamic acid not administered) was 866.9239.23, with considerably lesser mean estimated blood loss, p-value 0.001. The overall average difference in Hb level was 0.460.10 in group A and 0.82 0.13 in group B, with considerably lesser drop in Hemoglobin levels, p-value < 0.001 (6).

Opposite to various studies with significant outcome, no significant difference was found in a study between the groups regarding the changes in hemoglobin (Hb) concentration, systolic and diastolic blood pressure (BP), and heart rate (7).

According to Laskshmi SJ et al, there was a substantial decrease in haemorrhage: 347.17ml + 108.6 in the study group versus 517.72ml + 150 in the control group (p<0.001). Well over 10% drop in haemoglobin was observed in 9.3% of participants in

the study group and 38.9% of participants in the control group (p<0.01) (8).

PPH is generally described as loss of blood of some more than 500 mL after a vaginal delivery or more than 1000 mL after a caesarean section. A blood loss of 1000 mL appears to be frequent for a healthy female having the caesarean section, but for a lady with severe anaemia or cardiac condition, blood loss of even 200 mL may be fatal (9).

Thus, rationale of this study is that it is important to evaluate the efficacy and safety of TA on blood loss with LSCS. This study will help improving the management guidelines and reduction of PPH. This study compared the outcome of prophylactic Tranexamic Acid (TA) with a control group in terms of reduction of blood loss due to post partum hemorrhage (PPH) with elective caesarean section.

MATERIALS & METHODS:

This RCT was done in the Department of obstetrics & gynecology, six months after approval of synopsis. All females of age 20 to 40 years having nulliparous or multipara singleton pregnancy at 37-40 weeks of gestation (calculated from 1st day of last menstrual period) admitted for elective caesarian section under spinal anesthesia were included in the study.

Participants were included proper permission from the Ethical Review Committee. Cases were separated into two subgroups: case: (A) and control: (B). In the operating theater, participants were given A and B packages to choose from, the contents of whom were only known to the nurse in charge of drug preparation. All meds were injected by an anesthetist who was not in charge of supervising or assessing the patients. Spinal anesthesia was administered to both groups. We only gave uterotonics required for active management of third stage of labour like injection syntocinon to both groups and nothing else as we wanted to determine the efficacy of tranexamic acid and compare it with control group to see blood loss. Then, both the groups were compared regarding the percentage of fall in haemoglobin 24 hours after surgery. But patients with significant blood loss were managed with all the standard measures used for management of PPH i.e injection syntocinon 10 units Tab misoprostal 800mg and further surgical measures if needed.

For the quantitative variables like age, weight, height, BMI, Hb at baseline and after 24 hours, %age fall in Hb, mean $\pm$ SD was calculated. Efficacy / outcome of the TXA versus placebo was compared using chi square test to see the significance. $p < 0.05$ will, be considered significant. Effect modifiers like age, parity, BMI, were controlled by stratification to find out effect of these on the outcome, through chi square ($p < 0.05$ will, be considered significant).

RESULTS

Demographics of the patients shows that mean age in Group A was 27.37 $\pm$ 3.85 years and in Group B 27.77 $\pm$ 3.13 years, p -value=0.660, gestational age was 38.60 $\pm$ 1.19 weeks in Group A and 38.53 $\pm$ 1.25 weeks in Group B, p -value=0.833, parity shows 1.70 $\pm$ 1.29 in Group A and 1.87 $\pm$ 1.14 in Group B, p -value=0.598, Hb levels at baseline was 10.30 $\pm$ 0.86 in Group A and 10.34 $\pm$ 0.81 in Group B, p -value=0.853, Hb levels after treatment in Group A 9.44 $\pm$ 0.84 and in Group B 9.41 $\pm$ 0.76, p -value=0.885, mean BMI in Group A was 25.70 $\pm$ 2.04 and in Group B 25.97 $\pm$ 1.97 in Group B, p -value=0.609. (Table 1)

Comparison of both %age reduction in Hb levels ($>10\%$) after treatment shows that in Group A 6(20%) and in Group B 15(50%) had $>10\%$ reduction in Hb levels after treatment, p -value=0.015. (Table 2)

Table 1: Demographics of the patients

Variables	Group A(n=30)	Group B (n=30)	P value
Age	27.37 $\pm$ 3.85	27.77 $\pm$ 3.13	0.660
Gestational age	38.60 $\pm$ 1.19	38.53 $\pm$ 1.25	0.833
Parity	1.70 $\pm$ 1.29	1.87 $\pm$ 1.14	0.598
Hb levels at baseline	10.30 $\pm$ 0.86	10.34 $\pm$ 0.81	0.853
Hb levels after treatment	9.44 $\pm$ 0.84	9.41 $\pm$ 0.76	0.885
BMI	25.70 $\pm$ 2.04	25.97 $\pm$ 1.97	0.609

Table 2: Comparison of both %age reduction in Hb levels ($>10\%$) after treatment

Treatment			Group		Total	P-value
			A	B		
%Reduction	Yes	Count	6	15	21	0.015
		% within Group	20.0%	50.0%	35.0%	
	No	Count	24	15	39	
		% within Group	80.0%	50.0%	65.0%	
		Count	30	30	60	
		% within Group	100.0%	100.0%	100.0	

DISCUSSION

After caesarean delivery, one of the earliest and commonest complications is the post partum hemorrhage (i.e more than 1000 ml of blood loss for cesarean delivery with a hematocrit decrease greater than 10%). It is the leading cause of maternal mortality in developing nations. Furthermore, it is the leading cause of about one-quarter of all maternal deaths worldwide (10). Our research included 60 healthy full-term pregnant females aged 20 to 40 who were booked for an elective caesarean section under the effect of spinal anaesthesia. There were no statistically significant differences in maternal age or maternal age seen between two categories analysed in this research. In our research of 60 healthy participants, 30 gained a dosage of 1 g of IV TA dissolved in 20 ml of 5% dextrose solution gradually over 20 minutes at 15 minutes until surgical incision, while the remaining 30 obtained a placebo. The amount of blood lost per operatively, that is, from the time of placental delivering to the final moment of CS, was significant statistically, with an average loss of blood of 293.6 ml in the research group vs 328.3 ml in the other group ($P = 0.000$). TXA substantially diminished the quantity of haemorrhage during caesarean section, as per another research. Haemorrhage was reduced significantly from placental exclusion to the closing of cesarean section: 347.17 ml in the study group vs 517.72 ml in the control group ($P < 0.001$). Lakshmi and Abraham (8). The benefits and risks of TA in lowering haemorrhage after placental

detachment after lower segment caesarean section were investigated in a research.

According to one survey, TXA markedly lowered the quantity of blood lost throughout caesarean section, the proportion of haemoglobin drop both pre as well as post surgery, and the number of patients who had a haemoglobin drop of more than 10%. 9.3% of patients in the study group and 39% in the control group had a drop in haemoglobin level (P) of greater than 10% (8). Bhatia et al., (11) discovered the differences that were significant statistically in haemoglobin and hct 24 hours post caesarean section between the subgroups analysed. Those very same findings are identical to the current research, with the exception that in our research, haemoglobin levels were evaluated after 24 hours.

Ali et al., (12) discovered that haemoglobin levels 24 hours after a caesarean delivery were significantly higher in the tranexamic group than in the control group (12.57 $\pm$ 1.33 in the tranexamic group and 11.74 $\pm$ 1.14 in the control group, $P = 0.002$). Other researches reported no health problems or adverse reactions for either of the groups, which is similar to our findings (13). TA administration reduced dramatically the bleeding throughout CS, the proportion of patients who lost more than 1000 mL of blood, and the requirement for supplemental uterotonic substances.

Ifunanya et al., (14) investigated the effectiveness of TXA in lowering excessive bleeding prior to caesarean section. The TXA group had a markedly decreased amount of patients that required extra uterotonic agents than the controls. Because pregnancy is a prothrombotic condition, the probability of thrombus formation increases among pregnant women. Nonetheless, there were no adverse effects or problem related to the use of this antifibrinolytic in the early postoperative period. As a result, TA can be employed very safely and successfully in patients receiving caesarean section.

CONCLUSION

TA administration reduced dramatically the bleeding throughout CS, the proportion of patients who lost more than 1000 mL of blood, and the requirement for supplemental uterotonic substances. As a result, TA can be employed very safely and successfully in patients receiving caesarean section.

REFERENCES

1. Lancaster L, Barnes RFW, Correia M, Luis E, Boaventura I, Silva P, et al. Maternal death and postpartum hemorrhage in sub-Saharan Africa - A pilot study in metropolitan Mozambique. 2020;4(3):402-12.
2. Pabinger I, Fries D, Schöchl H, Streif W, Toller W. Tranexamic acid for treatment and prophylaxis of bleeding and hyperfibrinolysis. Wiener klinische Wochenschrift. 2017;129(9-10):303-16.
3. Li C, Gong Y, Dong L, Xie B, Dai Z. Is prophylactic tranexamic acid administration effective and safe for postpartum hemorrhage prevention? A systematic review and meta-analysis. Medicine (Baltimore). 2017;96(1):e5653.
4. Abu-Zaid A, Baradwan S, Badghish E, AlSghar R, Ghazi A, Albouq B, et al. Prophylactic tranexamic acid to reduce blood loss and related morbidities during hysterectomy: a systematic review and meta-analysis of randomized controlled trials. Obstetrics & gynecology science. 2022;65(5):406-19.
5. Levy JH, Koster A, Quinones QJ, Milling TJ, Key NS. Antifibrinolytic Therapy and Perioperative Considerations. Anesthesiology. 2018;128(3):657-70.
6. Kafayat H, Janjua M, Naheed I, editors. To Assess the Prophylactic Role of Tranexamic Acid in Reducing Blood Loss during and After Two Hours of Caesarean Section 2019.
7. Milani F, Haryalchi K, Sharami SH, Atrakroshan Z, Farzadi S. Prophylactic effect of tranexamic acid on hemorrhage during and after the cesarean section. Aras Part Med Int Press. 2019;7:74-8.
8. Lakshmi SD, Abraham R. Role of Prophylactic Tranexamic Acid in Reducing Blood Loss during Elective Caesarean Section: A Randomized Controlled Study. Journal of clinical and diagnostic research : JCDR. 2016;10(12):Qc17-qc21.

9. Chi BH. Translating clinical management into an effective public health response for postpartum haemorrhage. BJOG : an international journal of obstetrics and gynaecology. 2015;122(2):211.
10. Saccone G, Della Corte L. Prophylactic use of tranexamic acid after vaginal delivery reduces the risk of primary postpartum hemorrhage. 2020;33(19):3368-76.
11. Bhatia SK, Deshpande H. Role of tranexamic acid in reducing blood loss during and after caesarean section. Medical Journal of Dr DY Patil University. 2015;8(1):21.
12. Ali SAA, Oof TF, Elmolla MF. Efficacy of Intravenous Tranexamic Acid in Reducing Blood Loss after Elective Cesarean Section. The Egyptian Journal of Hospital Medicine. 2019;74(6):1353-8.
13. Chattopadhyay S, Sarkar S, Chakrabarti S, Mandal M. Effect Of Intravenous Tranexamic Acid Administration On Blood Loss During And After Elective Caesarean Delivery - A Randomised Placebo-Controlled Study. Journal of Evolution of medical and Dental Sciences. 2017;6:1286-92.
14. Ifunanya NJ, Chukwu IC, Nobert OC, Blessing O, Chibuzor UD-P, Uchenna OV. Tranexamic acid versus placebo for prevention of primary postpartum haemorrhage among high risk women undergoing caesarean section in Abakaliki: a randomized controlled trial. Open Journal of Obstetrics and Gynecology. 2019;9(6):914-22.