Original Article

Efficacy of Tranexamic acid in reducing blood loss during and after Cesarean section

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Objective: To assess effect of tranexamic acid on blood loss during and after cesarean section.

Methodology: We performed a randomized controlled trial at Bahawal Victoria Hospital, Bahawalpur from March to December 2013. A total of 120 parturient women with singleton gestation planned to have cesarean section (CS) at ?37 weeks were randomized to receive 1 g tranexamic acid slowly intravenously over 10 minutes or placebo injection 20 minutes before CS. Blood loss was measured during and for up to two hours after the operation. Any side effects, complications, medications required, and duration of hospital stay were recorded.

Results: Sixty women received transexamic acid and 60 received placebo. Mean blood loss was 260±11 ml vs 485±16 ml in the tranexamic acid group versus the control group (p = 0.003). Only mild, transient adverse effects like nausea and visual disturbances were observed in study group.

Conclusions: Administration of tranexamic acid was associated with reduced blood loss during and after CS. This could be of benefit for anemic women or those who either refuse blood transfusion or can't arrange donors. (Rawal Med J 2014;39:311-313).

Key words: Tranexamic acid, cesarean section, PPH.

INTRODUCTION

Tranexamic acid (TRX) is a synthetic analog of lysine. It slows the dissolution of the clot by blocking the interaction between native fibrin and activated plasminogen. It has been used to reduce the blood loss and need of blood products in the perioperative period or in menorrhagia.[1] Shakur et al. showed reduction of overall mortality and massive bleeding from trauma patients receiving an early dose of 1 g TRX.[2] Henry et al. concluded the reduced of need of transfusion with TRX use as preventive medication.[3]

High dose of TRX (4 g) has been shown to reduce blood loss, duration of bleeding, and transfusion need in a randomized controlled trial in postpartum hemorrhage.[4] The World Maternal Antifibrinolytic (WOMAN) Trial, a large multi-national randomized placebo controlled trial is currently underway to evaluate the effectiveness of 1 g dose of TRX at the onset of postpartum bleeding.[5] The side effects are mild to moderate (nausea and visual disturbances) and transient. TRX is an economical drug. As severe postpartum anemia remains a woman health challenge and the availability of blood products (pack cells) is sometimes limited, the use of TRX could be considered in selected anemic population undergoing CS. The aim of this study was to assess effect of TRX on blood loss during and after CS and compare this with placebo.

METHODOLOGY

This a randomized controlled trial was conducted the department of Obstetrics and Gynaecology, Bahawal Victoria Hospital, Bahawalpur, Pakistan in collaboration with the departments of Pharmacology and Pathology, Quiad-e-Azam Medical College Bahawalpur. The study was carried out in a period of eight months from March to December 2013.

A total of 120 parturient women having singleton gestation, planned to have CS at ?37 weeks were randomized to receive 1 g TRX slowly intravenously over 10 minutes or placebo injection 20 minutes before surgery. Blood loss was measured

during and for up-to two hours after the completion of CS. Vital signs were monitored after every 15-minutes and any side effects, complications, medications required, and duration of hospital stay were recorded.

All data were analyzed using SPSS software. The normality of the distributions was tested using the Shapiro-Wilk test. Comparisons between groups were performed using the Chi-Square test. For numerical variables, we used Student's t-test. A $p<0.05$ was considered statistically significant.

RESULTS

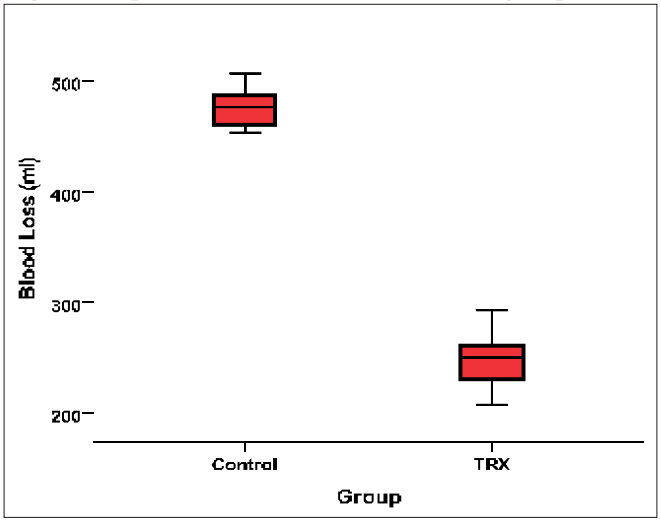
Sixty parturient women received tranexamic acid and control group each. Mean age was 23.56±3.82 years in TRX group and was comparable to control group (p=0.344), as shown in Table 1.

Table 1. Maternal and Obstetric characteristics.

Characteristics	Groups		*p* value
	TRX	Control	
Number of patients	60	60	-
Mean age, yr (± SD)	23.56 ±3.82	24.18±3.47	0.344
Mean weight, kg (± SD)	55.36±5.19	53.92±4.73	0.525
Mean height, cm (± SD)	152±7.71	150±8.27	0.451
Parity: primiparae, n (%)	38 (63.33%)	43 (71.67%)	0.219
Mean gestational age, weeks (± SD)	39±2	39±2	1.000
Abnormal placental insertion, n (%)	2 (3.33%)	3 (5.00%)	0.720

Average blood loss in TRX and control group was 481±12.06 ml and 260±17.23 ml (p=0.001) (Fig. 1). Only mild, transient adverse effects like nausea and visual disturbances were observed in TRX group.

Fig. 1. Comparison of blood loss between two groups.



DISCUSSION

Because of maternal mortality and morbidity of obstetric hemorrhage (ante-partum and post-partum hemorrhages), it must be investigated and national guidelines may be developed for its management.[6] TRX has been used to reduce the bleeding in a variety of surgeries for many years.[7] More recently, it has been used to prevent or decrease intra- and postoperative blood loss in various surgical procedures.[8-11]

Regarding CS, it is pertinent to know that during placental separation, fibrinogen and fibrin degrade rapidly. The products of plasminogen and fibrin degradation increase owing to activation of the fibrinolytic system, which can last 610 hours, causing more bleeding. Hence, it is one the procedures in which TRX can be used as it can inhibit fibrinolysis, resulting in less bleeding and thus alleviating the need of transfusion.[12]

A recent Cochrane review concluded that TRX was useful in the management of post partum haemorrhage.[13] After elective CS at ?37 weeks gestation, 1 g TRX intravenously was associated with significantly reduced blood loss.[14] Similarly, Shahid et al. reported that TRX can be used safely and effectively in women undergoing lower segment cesarean section to reduce intra-operative blood loss.[15] A study by Movafegh et al. found that the total oxytocin administration after the delivery of the fetus was less in the TRX group when compared to the control group.[16] On cost analysis, TRX has been found to be much more cost-effective in comparison to blood transfusion.[17]

Our study showed that TRX significantly reduced bleeding after CS. There was no significant alteration in the vital signs of subjects following TRX administration. The incidence of thrombosis during pregnancy and puerperium is 5-6 times higher than that in the general population.[18] When antifibrinolytic drug tranexamic acid is being administered it is advised to look for increased risk of post-partum thrombosis after CS. In the present study, no patient developed thrombosis and incidences of side effects like nausea, vomiting and diarrhea were not statistically significant by difference in the two groups. These results are consistent with other studies.[18-20]

CONCLUSIONS

Administration of tranexamic acid was associated with reduced blood loss during and after cesarean section. This could be of benefit for anemic women or those who either refuse blood transfusion or can't arrange donors.

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Conception and design: NA, EU
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Analysis and interpretation of the data: EU, ZB, S
Drafting of the article: ZB, S, MHC
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