

ORIGINAL ARTICLE

Mean Blood Loss with Prophylactic Tranexamic Acid in females undergoing Cesarean Section

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ABSTRACT

Background: Obstetric hemorrhage is the most common and dangerous complication encountered during child birth and postpartum hemorrhage accounts for about one-quarter of all maternal deaths globally, especially in developing countries. Tranexamic acid (TXA) with its antifibrinolytic properties, is widely in use for prophylactic treatment of heavy blood loss from trauma, surgery, removal of tooth, bleeding from nose, postpartum bleeding and heavy menstrual bleeding.

Aim: To assess the mean blood loss with prophylactic tranexamic acid in females undergoing elective cesarean section

Methods: Descriptive case series study conducted in the Department of Obstetrics & Gynecology, DHQ Hospital, Gujranwala from August 2018 to February 2019. After meeting the inclusion criteria 550 females were enrolled. Informed consent and demographic details of the selected females were taken. Then females were given 1g of intravenous TXA 30 minutes before cesarean section. All cesarean sections were done under spinal anesthesia. All included females were followed-up till delivery of the fetus and placenta and blood loss was also noted. SPSS version 21 was applied for data collection and analysis.

Results: In this study the mean age of the females was 29.07±6.49 years, 92(16.73%) females were nulliparous. The mean value of BMI was 26.75±4.76 kg/m². The mean intra-op, post-op and total blood loss of the females was 300.15±29.13 ml, 99.55±29.43 ml & 399.70±41.98 ml respectively.

Conclusion: According to this study the total mean blood loss with prophylactic TXA in females undergoing elective cesarean section was 399.70±41.98 ml

Keywords: Females, Cesarean Section, Prophylactic Tranexamic Acid, Blood Loss

INTRODUCTION

Globally, about one-quarter of all maternal deaths are due to Postpartum haemorrhage. Uterine atony stands as one of the major cause leading to massive obstetric haemorrhage. Other causes include injury to genital tract, retained products of conception, placental abruption, placenta accreta, and amniotic fluid embolism^{2,3}.

Previous history of PPH, obesity, first pregnancy, previous caesarean section, prolonged labor, multiple pregnancy, macrosomia and polyhydramnios are the other risk factors which may lead to postpartum haemorrhage⁴.

Until recently, number of uterotonic medications, especially oxytocin and misoprostol, are used to prevent and control PPH. Tranexamic acid (TXA), a competitive inhibitor of plasminogen activation has recently been studied and proved to be a useful drug for both prevention and treatment of PPH. It has also been shown to reduce bleeding caused by trauma, surgery especially cardiac surgery and heavy menstrual bleeding¹.

A large multicentered RCT has proven the role of tranexamic acid TXA in the treatment of PPH after vaginal delivery and caesarean section. Its prophylactic role in control and prevention of PPH is under consideration⁵. However, evidence suggests that TXA used prophylactically in the setting of caesarean birth may decrease blood loss and incidence of PPH. Some studies have also shown associated risks with the use of tranexamic acid. So there is a need to be aware of the evolving knowledge of TXA in the obstetric setting in order to augment the beneficial effects on the mother while at the same time reducing any potential harmful effects on the neonate⁶.

It has been stated that the mean intra-operative and post-partum blood loss were: 499.11±111.2 and 59.93±12.5ml, respectively with TXA in females who underwent cesarean section.⁷ Another trial showed that mean blood loss was 222.07±97.02ml with TXA⁸. One study showed that there was significantly less mean blood loss with TXA that was 367.02±51.10ml⁹. But one study showed that mean blood loss was 454.5±201ml with TXA¹⁰.

The rationale of this study was to assess the mean blood loss with prophylactic TXA in females undergoing elective

cesarean section. Through literature, it has been noticed that with prophylactic TXA, the results regarding mean blood loss were varied. Moreover, it is not practiced in local setting due to non-availability of magnitudes in local literature. So this study was conducted to get local evidence, which would favor the beneficial role of prophylaxis TXA for reduction in total blood loss during and after cesarean section in females and be able to implement the use of TXA given as prophylaxis to prevent excessive blood loss and to prevent the females from mortality and shock. This would help us to improve our practice and update local guidelines in females undergoing elective cesarean section.

MATERIALS AND METHODS

This descriptive case series study conducted in the Department of Obstetrics & Gynecology, DHQ Hospital, Gujranwala from August 2018 to February 2019 after IRB permission. Sample size of 550 cases was calculated with 95% confidence level, d=1% and taking mean blood loss i.e. 59.93±2.50ml with prophylactic TXA in females undergoing elective cesarean section. Sampling Technique used was non-probability, consecutive sampling. Pregnant females, aged 18-40 years, any parity undergoing elective cesarean section at term (>37 weeks of gestation on LMP) were included in the study.

Exclusion criteria

- Multiple pregnancy (on USG)
- Abnormal placenta (accrete, increta, previa) or placental abruption (on USG)
- Females with chronic or gestational hypertension (BP≥140/90mmHg), diabetes (BSR>186mg/dl), renal problem (creatinine >1.2mg/dl), liver problem (ALT>40IU, AST>40IU), anemia (Hb<10mg/dl)
- Females with INR>2, PT>20sec, aPTT>15sec

Data Collection Procedure: 550 females undergoing cesarian section at operation theatre of Department of Obstetrics & Gynecology, DHQ Hospital, Gujranwala fulfilling the inclusion criteria were included. Informed consent was obtained. Demographic information (name, age, gestational age, parity, BMI) was also noted. Then females were given 1g of intravenous TXA 30 minutes before cesarean section. All cesarean sections were done under spinal anesthesia. Then all females were followed-up till delivery of the fetus and placenta. Their blood loss during surgery was noted. The females were then shifted in post-delivery

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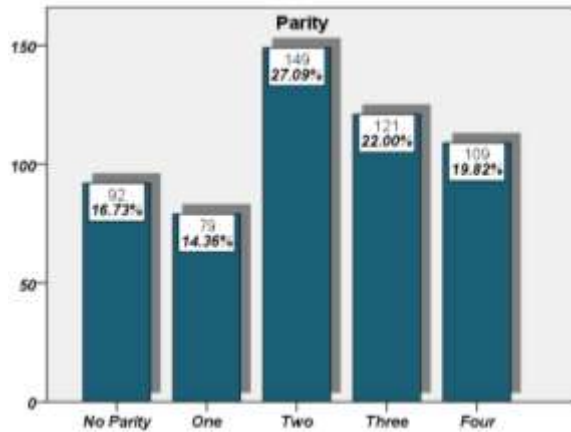
wards and were followed-up there for 6 hours. Blood loss was noted in post-surgical wards. Total blood loss was calculated by using cotton swabs and sanitary pads placed during caesarean section and delivery. Weight of dry cotton swabs and sanitary pads were noted and then soaked swabs and pads were weighed on weight machine. Weight of dry swab and pads were measured and subtracted from weight of soaked swab and pads and weight were calculated in milligram, where 1mg=1ml. All this information was recorded through pre-designed proforma.

Data Analysis: The collected data was analyzed by using SPSS version 21. Quantitative variables like age, gestational age, BMI and total blood loss (during and after surgery) were presented as mean ± SD. Parity was presented as frequency. Data was stratified for age, parity, BMI, previous caesarean section and gestational age. Post-stratification, Independent sample t-test was applied to compare mean blood loss in each strata taking p-value ≤0.05 as significant.

RESULTS

In this study total 550 females were enrolled. The mean age of the females was 29.07±6.49 years with minimum & maximum values of 18 & 40 years.

Fig. 1: Frequency distribution of parity



The mean gestational age of the females was 38.98±0.820 weeks with minimum and maximum values of 38 & 40 weeks respectively. Out of 550 females, the mean BMI was 26.75±4.76 kg/m² with minimum and maximum values of 18.50±34.97 kg/m² respectively.

Fig. 2: Frequency distribution of previous caesarean sections



The mean intra-op blood loss of the females was 300.15±29.13 ml with minimum and maximum values of 250 & 350 ml respectively.

The mean post-op blood loss of the females was 99.55±29.43 ml with minimum and maximum values of 50ml & 150ml respectively. Out of 550 females the mean total blood loss of the females was 399.70±41.98 ml with minimum and maximum values of 308 & 496 ml respectively.

Table 1: Comparison of blood loss (Intra, post-op & total) with age

Blood Loss (ml)	Age (years)		p-value
	≤30	>30	
Intra-op	299.91±29.24	300.48±29.03	0.820
Post-op	101.06±29.04	97.50±29.89	0.160
Total	400.97±42.26	397.98±41.63	0.408

Table 2: Comparison of blood loss (Intra, post-op & total) with parity

Blood Loss (ml)	Parity		Parity
	Null & Primary	Null & Primary	
Intra-op	300.96±29.26	299.79±29.09	0.664
Post-op	101.16±28.64	98.82±29.79	0.387
Total	402.12±43.26	398.61±41.40	0.364

Table 3: Comparison of blood loss (Intra, post-op & total) with BMI

Blood Loss (ml)	BMI		Parity
	Normal	Overweight & obese	
Intra-op	300.72±29.09	299.79±29.19	0.715
Post-op	98.83±30.13	100.02±29.00	0.643
Total	399.54±43.78	399.80±40.82	0.943

According to this study there was insignificant difference between the intra-op, post-op & total blood loss of the females with gestational age i.e. p-value=(0.448, 0.758 & 0.838) respectively. Similarly, insignificant difference was found between the intra-op, post-op & total blood loss of the females with history of previous c-section i.e. p-value=(0.397, 0.917 & 0.504) respectively.

DISCUSSION

This descriptive case series study was carried out in the Department of Obstetrics & Gynecology, DHQ teaching Hospital, Gujranwala to assess the mean blood loss with prophylactic TXA in females undergoing elective cesarean section. Postpartum hemorrhage accounts for 25% of all the maternal deaths and 12% of women who survive will have severe anemia. There are several published clinical trials regarding the use of TXA for the treatment of PPH in an obstetric setting, but no consensus on its use or recommended guidelines for management^{11,12}.

In our study the mean intra-op blood loss of the females was 300.15±29.13 ml, the mean post-op blood loss of the females was 99.55±29.43 ml and the mean total blood loss of the females was 399.70±41.98 ml. Some of the studies showing their results are discussed below.

A published Cochrane Review meta-analysis, estimated the effectiveness of prophylactic TXA in reducing postpartum blood loss.¹³ It was found that TXA was effective in reducing postpartum blood loss. Although it included studies both on vaginal birth and cesarean sections but did not include any recent RCT¹⁴. One study by Natalia Novikova et al¹³ demonstrated in their study that mean blood loss in females after vaginal delivery and caesarean section was lower who were given TXA versus those who received placebo or in whom no intervention was done (mean difference MD - 77.79 mL, 95% CI -97.95, -57.64, five trials, 1186 women). The blood loss greater than 1000 ml was efficiently decreased with TXA in women undergoing cesarean section (RR 0.43, 95% CI 0.23, 0.78, four trials, 1534 women), but not after vaginal birth (RR 0.28, 95% CI 0.06, 1.36, two trials 559 women).

It has been stated that the mean intra-operative and post-partum blood loss were: 499.11±111.2 and 59.93±12.5ml, respectively with TXA in females undergoing cesarean section.⁷ Another trial showed that mean blood loss was 222.07±97.02ml with TXA⁸. One study showed that there was significantly less mean blood loss with TXA which was 367.02±51.10ml⁹. Chunbo Li

et al¹⁵ documented that in caesarean sections, TXA resulted in a reduction in intra-operative blood loss by a mean volume of 141.25mL (95% confidence interval [CI] -186.72 to -95.79, P<0.00001), reduction in post-operative blood loss by a mean of 36.42mL (95% CI -46.50 to -26.34, P<0.00001), and reduction in total blood loss by a mean of 154.25mL (95% CI -182.04 to -126.47, P<0.00001).

A study by SJ Dhivya Lakshmi et al¹⁶ documented that there was marked decrease in blood loss from the time of delivery of placenta till the end of surgery. The blood loss was 347.17ml in the study group and 517.72ml in the control group (p<0.001). Other variables included were fall in haemoglobin before and after the caesarean section and number of women who had more than 10% decrease in haemoglobin. More than 10% decrease in haemoglobin was found in 9.3% women in the study group and 39% of women in the control group with a p value of <0.01. One study has shown that mean blood loss was 454.5±201ml with TXA¹⁰.

A study by Movafegh et al¹⁷ showed that during both intra and post-operative period there was significant reduction in mean blood loss in the study group with TXA (10mg/kg). In this study, mean blood loss with TXA was app. 400 ml, which was reduced as compared to average blood loss, expected in caesarean section i.e. 1000 ml, although the results were not statistically significant as in previous other studies. Considering the high morbidity and mortality associated with PPH in our country especially in rural areas, TXA being a simple and cheap drug could be easily used for reducing average blood loss during caesarean section with ensuring proper guidelines and their implementation.

CONCLUSION

According to this study the total mean blood loss with prophylactic TXA in females undergoing elective cesarean section was 399.70±41.98ml.

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