

EFFICACY OF TRANEXAMIC ACID IN REDUCING THE BLOOD LOSS DURING CESAREAN SECTION IN PRIMIGRAVIDA PATIENTS WITH BREECH PRESENTATION

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ABSTRACT:

OBJECTIVES:

The objective of the study was to evaluate the efficacy of tranexamic acid in decreasing blood loss at the caesarian section (CS).

METHODOLOGY:

A descriptive case series study was conducted in the Department of Obstetrics and Gynecology, Lady Reading Hospital, Peshawar, Pakistan. Data were collected from September 24, 2018, to March 24, 2019. A total of 114 term women (18-35 years age) with singleton term breech cases were analyzed for a period of six months

RESULTS:

In this study the mean age was 30 years with $SD \pm 2.341$ and the mean period of gestation was 38 weeks with $SD \pm 4.76$. Moreover, tranexamic acid was effective in 91% of patients and was not effective in 9% of patients.

CONCLUSION:

Our study concludes that the efficacy of tranexamic acid was 91% in reducing the blood loss during CS in primigravida patients with breech presentation.

KEYWORDS: Tranexamic Acid, Cesarean Section, Primigravida, Breech Presentation

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INTRODUCTION:

Planned CS was found to be safer for singleton term breech babies than planned vaginal birth, managed according to a clinical protocol, but was related to more complications for mothers¹. Breech presentation is delineated as a fetus in a longitudinal line with the buttocks or feet closest to

the cervix. Breech deliveries have been reported in 3-4% of all types of deliveries. Its frequency decreases with advancing gestational age from 22-25% of births prior to 28 weeks gestation to 7-15% of births at 32 weeks gestation to 3-4% of births at term². Cesarean section (CS) mentions the delivery of a fetus, placenta, and membranes via an abdominal and uterine incision³. CS can give rise to more complications than normal vaginal delivery⁴. Postpartum hemorrhage (PPH) is one of the most common complications of CS, which is accountable for 20% of maternal deaths worldwide⁵. In the developed world rates of CS have increased by 23.8% to 50%, whereas in developing countries, this rate is falling to >10%, and in Pakistan the rate of CS is 25%⁶. According to the World Health Organization PPH is described as "blood loss from the birth canal in excess of 500

mL during the first 24 hour after delivery". Clinically, it is related to sweating, tachycardia, and weakness, with hemodynamic collapse, which takes place at losses of between 35 and 45% of blood volume⁷. The use of pro-hemostatic drugs such as Tranexamic acid may go a long way in the prevention of PPH in SC. Tranexamic acid (TA) is mainly an antifibrinolytic agent that has been indicated to decrease blood loss and transfusion requirements in different elective surgeries⁷. It is a synthetic derivative of the amino acid lysine that puts in its anti-fibrinolytic effect via the reversible barricade of the lysine binding sites on plasminogen molecules⁸. TA also prevents the transformation of plasminogen to plasmin by plasminogen activator⁸. It has been found to be very useful for lowering blood loss and necessary for blood transfusion⁹. In Pakistan, limited literature is available on the effects of TA in primigravida patients with breech presentation. The objective of this study is to assess the efficacy of prophylactic injection of tranexamic acid in the reduction of blood loss during CS in primigravida patients with breech presentation.

METHODOLOGY:

A descriptive case series study was carried out among 114 patients (18-35 years of age) with singleton pregnancy from September 2018 to March 2019 at the Department of Obstetrics and Gynecology, Lady Reading Hospital, Peshawar, Pakistan. The protocol was approved by the ethical committee of the Department of Obstetrics and Gynecology, Lady Reading Hospital, Peshawar. Informed consent was taken before data collection. Sample Size was calculated by using the following formula:

$$\frac{z^2 pq}{d^2}$$

Efficacy=92%

q=1-p and d=5% with 95% confidence interval level. Inclusion criteria were women aged 18-35 years age, singleton pregnancy and primigravida, gestational age >36 weeks on last menstrual period (LMP), breech presentation as per operational definition. Patients who had allergy to tranexamic acid, thrombotic disorders, abnormal placenta (placenta previa, placental abruption), diabetes, hypertension, were excluded from the study. In the present study 114 patients from the indoor Department of Obstetrics and Gynaecology of Lady Reading Hospital, Peshawar have included the study. After informed consent, basic

demographics were noted and all women were given TA 10 minutes before giving incision injection. TA 1gm were diluted with 20ml 5% dextrose and it infused IV slowly over 5 minutes. After delivery of baby oxytocin, 20 units IV Drip were given. Efficacy was recorded as per operational definition i-e estimated blood loss <500 ml following placental delivery till the end of the surgery. Blood was measured by using the soaked gauzes, pads (measured by subtracting pre-use weight from post-use), and blood clots, which were weighed by standardizing one milliliter of blood to one gram and noted on specially designed proforma. Data were analyzed with IBM SPSS (version. 22). Frequency and percentage were computed for qualitative variables like age groups and efficacy. Mean±SD were presented for quantitative variables like age, gestational age, duration of the procedure, weight, height, and BMI. Effect modifiers like age, gestational age, duration of the procedure, and BMI were controlled by stratification. Post-stratification Chi-square test was applied and p ≤0.05 was considered statistically significant.

RESULTS:

Table 1: Demographic Features of Patients

Characteristics	N (%)	Mean±SD
Age (114)		
18-25 Years	65 (57%)	30±10.341
26-35 Years	49 (43%)	
BMI		
<25 Kg/m ²	52 (46%)	2±5.11
>25 Kg/m ²	62 (54%)	
Gestational Period		
37-39 Weeks	82 (72%)	38±4.76
40-41 Weeks	32 (28%)	
Duration		
<45 Minutes	71 (62%)	45±7.12
>45 Minutes	43 (38%)	

Table 2: Efficacy of TA among Patients

Efficacy	N (%)
Effective	104 (91)
Not Effective	10 (9)
Total	114 (100)

Table 3: Stratification of Efficacy w.r.t Age, Gestational Age, BMI and Duration of Procedure

Stratification of Efficacy w.r.t Age Distribution	Efficacy		P-Value
	Effective	Not Effective	
18-25 Years	59 (52%)	45 (39%)	0.8419
26-35 Years	6 (5%)	4 (4%)	
Stratification of Efficacy w.r.t Gestational Age	Efficacy		0.8869
	Effective	Not Effective	
37-39 Weeks	75 (66%)	29 (25%)	0.8869
40-41 Weeks	7 (6%)	3 (3%)	
Stratification of Efficacy w.r.t BMI	Efficacy		0.7090
	Effective	Not Effective	
<25 Kg/m ²	48 (42%)	56 (49%)	0.7090
>25 Kg/m ²	4 (4%)	6 (6%)	
Stratification of Efficacy w.r.t Duration of Procedure	Efficacy		0.5979
	Effective	Not Effective	
<30 Minutes	64 (56%)	40 (35%)	0.5979
>30 Minutes	7 (6%)	3 (3%)	

DISCUSSION:

TA is a competitive inhibitor of plasminogen activation and can decrease blood loss by preventing the breakdown of fibrinogen and fibrin clots¹⁰. TA has been extensively used to cure heavy menstrual bleeding and to decrease blood loss in elective surgery where it decreases blood transfusion by about one-third^{11,12}. For many years it has been used for the cure of several types of bleeding e.g. menorrhagia, postoperatively, or intra-operatively^{12,13}. WHO recommended TA to decrease death due to bleeding in women with PPH regardless of cause, and with no adverse maternal effects¹⁴. In the present study, 114 patients were investigated. In this study the mean age of patients was 30 years with SD±2.341 and the mean POG was 38 weeks with SD±4.76. Moreover, the outcome clearly depicted that the blood loss was decreased by the usage of TA before CS. Similar results have been reported in a study that was carried out on 100 women undergoing lower segment cesarean section (LSCS). TA significantly reduced the quantity of blood loss from the end of LSCS to 2 hours postpartum which was 86.5 ml in the study group versus 142.70 ml in the control group (<0.001)¹⁵. Similarly, in the Indian population, Bhatia et al. (2015) and Singh et al. (2014) also investigated and revealed a reduction in blood loss by use of TA^{16,17}, 30% reduction in blood loss reported by Ahmed et al. in Ismailia Egypt¹⁸, and 34% reported by Maged in Cairo Egypt¹⁹. Similarly, in other similar studies carried out in India, Turkey, and

Iran it is reported reduction was between 39.1 to 43.7%²⁰⁻²². In another study conducted by Shahid et al. (2013) TA significantly reduced the amount of blood loss during the lower segment cesarean section (LSCS), but it did not decrease the blood loss significantly after the CS²³. These differences in findings of blood loss might be due to the different time intervals employed in evaluating the blood loss and the different approaches used in the valuation of blood loss in different studies.

CONCLUSION:

This study demonstrated that pre-operative intravenous tranexamic acid significantly reduced blood loss (91%) during CS in primigravida patients with breech presentation, but it did not significantly reduce the blood loss after the cesarean section.

LIMITATIONS:

Beside the strength of this study there are also some limitations of the study. First sample size was smaller. Data should be collected from a larger number in order to make results more authentic which will have a far reaching effect in future perspective.

CONFLICT OF INTEREST: None

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REFERENCES:

- Hofmeyr GJ, Hannah M, Lawrie TA. Planned caesarean section for term breech delivery. *Cochrane Database Syst Rev.* 2015;(7).
- Gray CJ, Shanahan MM. Breech presentation. Treasure Island (FL): StatPearls Publishing; 2021.
- Qadir M, Amir S. Predictors of Success Of Vaginal Birth After Previous Cesarean Section: An Analysis of 100 Cases. *Journal of Gandhara Medical and Dental Science.* 2017 Sep 1;4(1):13-7.
- Firoozi M, Tara F, Mazloum SR, Latifnejad Roudsari R. A qualitative inquiry to explore why women with previous cesarean-section do not choose vaginal birth after cesarean. *J Midwifery Reprod Health.* 2021;9(2):2753-62.
- Amanuel T, Dache A, Dona A. Postpartum hemorrhage and its associated factors among women who gave birth at

- Yirgalem General Hospital, Sidama Regional State, Ethiopia. *Health Serv Res Managerial Epidemiol.* 2021;8.
6. Rasool MF, Akhtar S, Hussain I, Majeed A, Imran I, Saeed H, et al. A cross-sectional study to assess the frequency and risk factors associated with cesarean section in Southern Punjab, Pakistan. *Int J Environ Res Public Health.* 2021;18(16):8812.
 7. Simonazzi G, Bisulli M, Saccone G, Moro E, Marshall A, Berghella V. Tranexamic acid for preventing postpartum blood loss after cesarean delivery: a systematic review and meta-analysis of randomized controlled trials. *Acta Obstet Gynecol Scand.* 2016;95(1):28-37.
 8. Sentilhes L, Sénat MV, Le Lous M, Winer N, Rozenberg P, Kayem G, et al. Tranexamic acid for the prevention of blood loss after cesarean delivery. *N Engl J Med.* 2021;384(17):1623-34.
 9. Cvetanovich GL, Fillingham YA, O'Brien M, Forsythe B, Cole BJ, Verma NN, et al. Tranexamic acid reduces blood loss after primary shoulder arthroplasty: a double-blind, placebo-controlled, prospective, randomized controlled trial. *JSES Open Access.* 2018;2(1):23-7.
 10. Wu X, Benov A, Darlington DN, Keese JD, Liu B, Cap AP. Effect of tranexamic acid administration on acute traumatic coagulopathy in rats with polytrauma and hemorrhage. *PLoS One.* 2019;14(10):e0223406.
 11. O'Brien SH, Saini S, Ziegler H, Christian-Rancy M, Ahuja S, Hege K, et al. An open-label, single-arm, efficacy study of tranexamic acid in adolescents with heavy menstrual bleeding. *J Pediatr Adolesc Gynecol.* 2019;32(3):305-11.
 12. Vogel JP, Oladapo OT, Dowswell T, Gülmezoglu AM. Updated WHO recommendation on intravenous tranexamic acid for the treatment of postpartum haemorrhage. *Lancet Global Health.* 2018;6(1):e18-9.
 13. Chattopadhyay S, Sarkar S, Chakrabarti S, Mandal MC. Effect of intravenous tranexamic acid administration on blood loss during and after elective cesarean delivery-A randomised placebo-controlled study. *J Evol Med Dent Sci.* 2017 Feb 23;6:1286-92.
 14. Shakur H, Beaumont D, Pavord S, Gayet-Ageron A, Ker K, Mousa HA. Antifibrinolytic drugs for treating primary postpartum hemorrhage. *Emergencias.* 2020;32(3):203-5.
 15. Ker K, Shakur H, Roberts I. Does tranexamic acid prevent postpartum haemorrhage? A systematic review of randomised controlled trials. *Bjog.* 2016 Aug 24;123(11):1745-52.
 16. Bhatia SK, Deshpande H. Role of tranexamic acid in reducing blood loss during and after cesarean section. *Med J DY Patil Univ.* 2015;8(1):21-5.
 17. Singh T, Burute SB, Deshpande HG, Jethani S, Ratwani K. Efficacy of tranexamic acid in decreasing blood loss during and after cacesareansection: a randomized case-control prospective study. *J Evolution Med Dent Sci.* 2014;3(11):2780-9.
 18. Ahmed MR, Ahmed WA, Madny EH, Arafa AM, Said MM. Efficacy of tranexamic acid in decreasing blood loss in elective caesarean delivery. *J Matern-Fetal Neonat Med.* 2015;28(9):1014-8.
 19. Obi VO, Umeora OU, Dimejesi IB, Asiegbu O, Mgbafulu CC, Ifemelumma CC, et al. Efficacy of intravenous tranexamic acid at reducing blood loss during elective caesarean section in Abakaliki: a double blind randomized placebo controlled trial. *Afr J Med Health Sci.* 2019;18(2):10-7.
 20. 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 Dec;10(12):QC17.
 21. Bellos I, Pergialiotis V. Tranexamic acid for the prevention of postpartum hemorrhage in women undergoing cesarean delivery: an updated meta-analysis. *American Journal of Obstetrics and Gynecology.* 2021 Sep 25.
 22. Sanad ZF, Ellakwa HE, Gomaa AM, Hamza HA, Elsalamony HH. Effect of tranexamic acid in reducing blood loss during and after cesarean delivery. *Menoufia Medical Journal.* 2020 Oct 1;33(4):1270.
 23. Shahid A, Khan A. Tranexamic acid in decreasing blood loss during and after cesarean section. *J Coll Physicians Surg Pak.* 2013 Jul 1;23(7):459-62.

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3. **Aamir Ali Khan** - Drafting Manuscript; Final Approval
4. **Saira** - Data Analysis/Interpretation; Supervision



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