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Original Research Paper

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ROLE OF TRANEXAMIC ACID IN REDUCING THE BLOOD LOSS IN CAESAREAN SECTION .

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ABSTRACT

BACKGROUND: In India due to improved institutional deliveries and obstetric care, caesarean section rates are increasing . Despite better obstetric care significant number if women die of obstetric hemorrhage . thus necessitating the need for evaluation of efficacy of tranexemic acid in reducing the blood loss during ceserean section .**MATERIALS AND METHODS:** A 1 year comparative study was done in 100 women undergoing cesarean section between January 2020 to December 2020. The study group of 50 women received one gram intravenous tranexamic acid and the control group of 50 women did not receive tranexamic acid. Primary outcome measure was blood loss during cesarean section. Secondary outcome measures were drop in post-operative hemoglobin , change in pulse rate and blood pressure, auxiliary procedures to stop bleeding, blood transfusion rate. **RESULTS:** the blood loss in study group was 227 ml less than the control group. The drop in hemoglobin in study group was ---- and control group was ---- the difference of 0.99 g% between the 2 groups which was significant .**CONCLUSION:** tranexemic acid is safe and effective drug to reduce blood loss in caesarean section.

KEYWORDS : tranexamic acid , caesarean section , post partum hemorrhage , hemoglobin , blood loss.

INTRODUCTION

In India due to improved institutional deliveries and obstetric care, caesarean section rates are increasing . the overall rate of ceserean section delivery is doubled over the last decade according to the data collected by union ministry of health and family welfare, In private hospitals it has increased from 17 % in 2008-09 to 33.8% in 2018-19 . obstetric hemorrhage along with hypertension and infection is one of the infamous triad of causes of death in both developed and developing countries.[1]

Tranexamic acid is a synthetic derivative of the amino acid lysine that exerts its anti-fibrinolytic effect through the reversible blockade of the lysine binding sites on plasminogen molecules.

It inhibits conversion of plasminogen to plasmin by tissue plasminogen activators. It has been proved to reduce blood loss in elective surgery, trauma patients, dentistry and menstrual blood loss[2]

The optimal dosage and the route of administration in obstetric patients is unknown. For general fibrinolysis, a single dose of 1 gm or 10 mg/ kg by slow intravenous injection is recommended.[3]

PPH is the most common cause of direct cause of maternal mortality . the incidence of PPHG after ceserean section is 6 % compared to 2-4% after vaginal delivery.[4]

Many uterotonic agents such as Oxytocin, Methyl ergometrine were studied in the past which radically reduced blood loss during Caesarean section other than these tranexemic acid is being studied as a prophylactic drug to reduce the blood loss and prevent the morbidity associated with it.[5]

MATERIALS AND METHODS

Source of data : Pregnant women undergoing caesarean section in obstetrics and gynecology department Navodaya Medical College Hospital And Research Center Raichur.

Study site : Navodaya Medical College, Hospital and Research Centre, Raichur.
Study design :comparative study
Sample size :100

INCLUSION CRITERIA

- Willing to participate in the study.
- Women of Age group of 20-35 years
- Term primigravida with singleton pregnancy.
- Term pregnancy with Previous 1 LSCS
- Term pregnancy with Previous 2 LSCS

E)EXCLUSION CRITERIA

- Patient not willing to give informed consent
- Multiple pregnancy
- Previous >2 LSCS
- Pre term pregnancy.
- Pregnancy with complications like polyhydraminos, severe pre eclampsia.
- Abnormal placenta like antepartum hemorrhage, placenta accrete , placental adhesions.
- Severe medical and surgical complications like liver disease, kidney disease, and heart disease.
- Previous history of stroke.
- History of thromboembolic and coagulation disorders.

Procedure of the study

- After obtaining institutional ethical committee approval and written and informed consent from the patient, 100 patients satisfying the inclusion and exclusion criteria will be randomly allocated into 2 groups

- **Study group(group A):** preoperatively , 20 mins before skin incision 1gm (10ml) of Tranexamic acid diluted in 10 ml of distilled water slowly infused I V over 5-10 mins,Oxytocin 10 units I V drip given immediately after delivery.

- **Control group(Group B):** Only 10 units of oxytocin drip administered after delivery.

Two separate period of blood measurements are considered in the study.
1)From placental delivery to the end of LSCS
2) From completion of LSCS to 2hrs postpartum, but this study ignores the blood loss prior to placental delivery and estimate of amniotic fluid.

- **Calculation of quantity of blood loss :**The quantity of blood loss= volume of blood in a suction bottle after placental delivery +(weight of gauge pads and sheets after surgery – weight of gauge pads and sheets before surgery)

- **Assessment tools:**The change in Hb value will be compared in both the groups 24 hours post operatively .Need for blood transfusion will be compared too.

- **Outcome measures** : safety and efficacy of tranexemic acid , by quantifying the blood loss , incidence of PPH , adverse effects , Vital signs , need for blood transfusion , Hb on 24 hours after LSCS.

RESULTS

Both groups were similar in age, gravidity, parity and period of gestation and there was no statistical significance (table 1)

Table 1 : Comparision of demographic variables

Variables	Study group(n=50) Mean +/- SD	Control group(n=50) Mean +/- SD	P value
Age	24.34 +/- 4.6	25.34 +/- 5.1	0.82
Gravidity	1.62 +/- 0.65	1.48 +/- 0.68	0.79
Parity	0.50 +/- 0.71	0.52 +/- 0.63	0.87
Period of gestation	39.24 +/- 1.42	39.48 +/- 1.22	0.61

Mean intraoperative blood loss during CS in study group was 325.23 ml while in control group was 512.45 ml the difference being 187 ml

post operative 2 hours blood loss in study group was 47.90 ml and in control group was 88.70 ml the difference being 40 ml

The difference between the total blood loss between the study and control group was 227 ml which was statistically significant (table 2).

Table 2 : Comparision of blood loss in study and control group(N=100)

	Study group(n=50)		Control group(n=50)		Mean difference
	Mean	SD	Mean	SD	
Intraoperative blood loss (ml)	325.23+/-70.96		512.45+/- 82.51		187 ml
Post op 2 hours blood loss (ml)	47.90+/- 8.55		88.70+/-17.14		40 ml
Total blood loss	373.13 601.15				227 ml

Similarly the post operative drop in haemoglobin was comparatively less in study group (10.84 to 9.8) compared to the control group(11.04 to 9.01) the mean difference of Hb between the 2 groups being 0.99 which was statistically significant (table 3).

Table 3 : Comparision of difference in hb in study and control group.

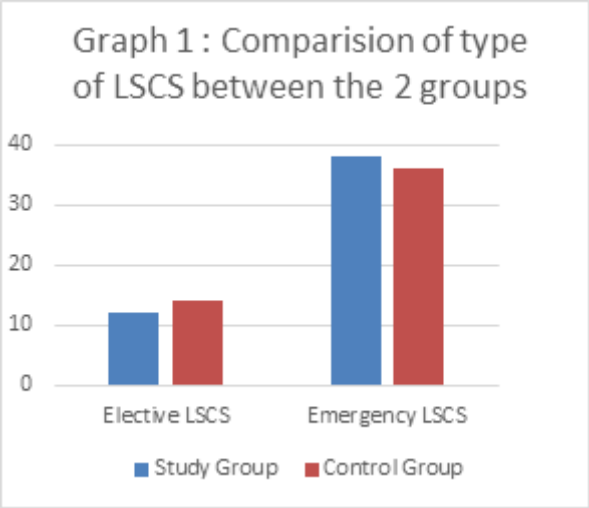
	Study (n=50) gm%		Control (n=50) gm%		Mean difference	P value
	mean	SD	mean	SD		
Before delivery	10.84+/- 0.75		11.04+/-0.89		.204	Not sig
After delivery	9.8+/-0.78		9.01+/-1.63		0.61	Not sig
difference	1.04+/-0.68		2.03+/-1.34		0.99	<0.005

There was no significant difference in the pulse rate and blood pressure measured immediate postoperatively and 6 hours post operatively between the 2 groups(table 4)

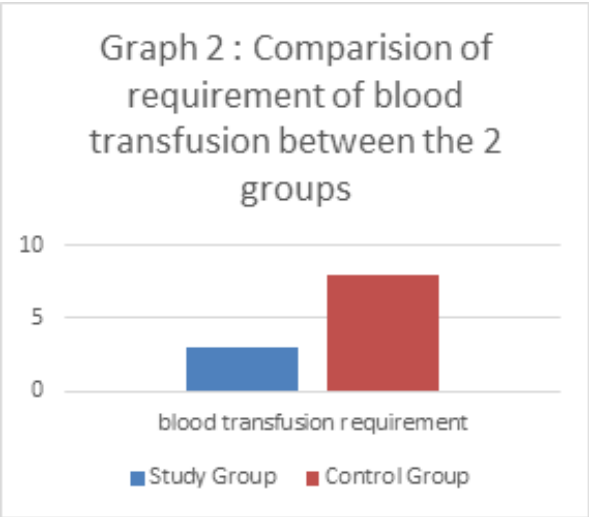
Table 4 : Post op vital parameters (N=100)

Variables	Study (n=50)	Control (n=50)	P value
Post op pulse rate	80 +/- 6.95	84+/-7.24	0.36
6 hours post op pulse rate	76.92+/-5.1	74.92+/-5.4	0.36
Post op BP (systolic)	118.36+/-7. 86	116.60+/-6.84	0.42
Post op BP (diastolic)	74.28+/-7.2	72.46+/-6.72	0.88
6 hours post op BP (systolic)	118.62+/-4.82	114+/-5.46	0.13
6 hours post op BP (diastolic)	74.42 +/- 5.08	72.46+/-5.42	0.40

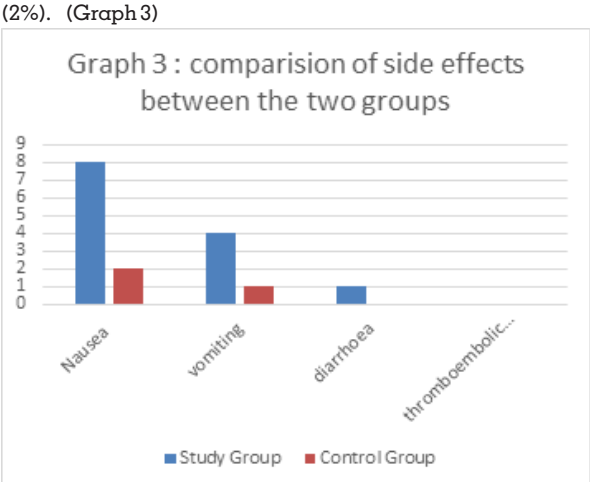
In study group 12 cases of elective and 38 cases of emergency cesarean while in control group 14 cases of elective and 36 cases of emergency cesarean . fetal distress and previous LSCS were the most common indications in both the groups (Graph 1)



8 patients in the control group and 3 patients in study group required blood transfusion . (Graph 2)



No patient had any major side effects of tranexemic acid while 16% had nausea , 8% had vomiting , 2% had diarrhoea . no signs of thromboembolic effects in the study group . In control group 2 patients had nausea (4%) and 1 patient had vomiting (2%). (Graph 3)



There was no significant APGAR score difference in neonates of both the groups at 1 and 5 minutes with P value of 0.36 and 0.40 respectively .

DISCUSSION

Most of the maternal deaths occur soon after giving birth and

almost all (99%) occur in low-income and middle-income countries.[6]

One fourth of these deaths occur due to hemorrhage, more following ceserean section. Reducing the blood loss post CS is of utmost need in developing countries like India where women enter pregnancy with an anemic state .

Following placental delivery, the level of fibrinogen and fibrin decreases and tissue plasminogen activator activity also increases converting plasminogen to plasmin. This activation can take up to six to ten hours in the postpartum period. The potent antifibrinolytic drug , Tranexamic acid inhibits this conversion and helps in reducing blood loss following CS.[7]

In a study conducted by the Singh et al. study . The difference in total blood loss was 240 ml more in the control group than the tranexamic acid group in our study it was 227 ml , both the groups had comparable results.[8]

In another study by Acharya et al , the total blood loss was 224 ml which in our study it was 227 ml both had similar results. The post operative drop in Hb in their control group(1.86) was more than the study group(0.82) , in our study hb difference 1.04 in tranexamic acid group and 2.03 in control group both the studies had statistically significant hb difference.[9]

In a study conducted by Simran et al the total blood loss in the tranexamic acid group was less than the control group (97 ml) in ours the tranexamic acid group had 227 ml less blood loss than control.[10]

The incidence of thrombosis during pregnancy and puerperium is 5-6 times higher then that in the general population . When the antifibrinolytic drug tranexamic acid is administered, the increased risk of post partum thrombosis after LSCS should be considered.[11]

In Mayur G et al study no thromboembolic were noted and the incidence like nausea (16%), vomiting(8%) diarrhoea (4%) were not statistically significant in both the groups .[12]

In a study conducted by Bhavana et al the immediate post-operative period and 6 hours post op , vitals were monitored and it was found that there was no difference in tranexamic acid group and control group. These results were relatable to the present study .[13]

CONCLUSIONS

Preoperative 1 gram Tranexamic acid significantly reduces the amount of blood loss, during and after LSCS. The use of Tranexamic acid in pregnancy is a safer option as we have not noted any adverse effects . Early referral to tertiary hospital is beneficial to prevent complications of PPH. The need for blood transfusion and its complications are reduced . Thus, Tranexamic acid can be used safely and effectively in subjects undergoing LSCS for decreasing morbidity and mortality from blood loss.

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