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TRANEXAMIC ACID IN DECREASING BLOOD LOSS DURING AND AFTER CESARIAN SECTION

Gynaecology

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ABSTRACT

Background- In obstetric practice, LSCS is reported to be the most common indication of blood transfusion (BT) as it may lead to severe intra-operative loss of blood. Varying figures from 1000 ml blood loss have been reported by different authors in women undergoing CS.
Methods- A total of 60 women, who underwent elective or emergency primary caesarean section at term between 37 and 42 weeks have been studied prospectively. They were divided into two groups. In the study group of 30, tranexamic acid 1 gm IV was given 20 minutes before making incision for caesarean section and the control group of 30 did not receive tranexamic acid.
Results- Tranexamic acid significantly reduced the quantity of the blood loss from time of placental delivery to 2 hours postpartum ($P < 0.001$) and from end of LSCS to 2 hours postpartum ($P < 0.001$).
Conclusion- A safe dose of tranexamic acid has an effective role in reducing blood loss during LSCS without causing adverse reaction.

KEYWORDS

CS, Blood loss, Tranexamic acid

INTRODUCTION

Each year a total 20 million cesarean sections (CS) are carried out worldwide, and over the last decades, rates of CS have increased speedily.[1]

In obstetric practice, LSCS is reported to be the most common indication of blood transfusion (BT) as it may lead to severe intra-operative loss of blood. Varying figures from 1000 ml blood loss have been reported by different authors in women undergoing CS.[2]

Among all pregnant women, 20% endure anemia, of that iron deficiency, folic acid deficiency, or both is the most common.[3] It is because of the fact that in pregnancy plasma volume is increased by 50%, red blood cells by 33%, and hemoglobin (Hb) by 18-20% mass. Furthermore, there is an increased demand of iron in the second half of pregnancy. All these physiological factors when combined leads to physiological anemia.[3]

Intravenous administration of tranexamic acid (TXA) has been routinely used for many years to reduce hemorrhage during and after surgical procedures.[4] It has been shown to be very useful in reducing blood loss and incidence of blood transfusion in these surgeries.

Use of TXA has been a subject of intense debate in combat situations. Findings from MATTERs study reveal that the use of TXA in conjunction with a blood component-based resuscitation following combat injury results in improved measures of coagulopathy and survival.[5] This benefit was present in all who receive blood transfusions in this setting but was most prominent in those requiring massive transfusion.

This study was done to evaluate the efficacy and safety of TXA in reducing the blood loss after placental delivery following LSCS and record any adverse effects following its administration.

MATERIALS AND METHODS

It included a total of 60 women who underwent primary caesarean section at term between 37 and 41 weeks of elective or emergency indication. They were randomly divided into the study group which received TXA and the control group which did not receive TXA, each group consisting of 30 patients.

Patients with severe medical and surgical complications involving heart, liver or kidney, brain diseases and blood disorders, abruptio placenta, placenta previa, multiple gestation, polyhydramnios, macrosomia, obstructed and prolonged labor, previous caesarean section, allergy to TXA, history of thromboembolic disorders, severe anemia were excluded from both the groups.

In study group TXA 1 gram, diluted in 10 ml distilled water was given slowly intravenously over 10 minutes in study group 20 minutes before making skin incision. Oxytocin 10 units in 1 pint ringer lactate and 0.2 mg of methylergometrine intramuscularly were given after delivery of neonates in both groups. Heart rate, respiratory rate, blood pressure were measured before surgery, immediately after placental delivery and within 1 and 2 hours after birth of baby.

STATISTICAL ANALYSIS

Quantitative outcomes were summarized with mean and standard deviation. Categorical outcomes were summarized with percentages. For quantitative outcomes, t-test was used to test for difference in the two groups. For categorical outcomes, chi square and odds ratio with 95% confidence interval were used as applicable. A P-value of < 0.05 was taken as significant.

RESULTS

Table 1. Socio-demographic variable

Variable	Study group	Control group	p-value
Age in yrs	23.24±2.16	23.61±2.41	0.621
Weight in kg	52.01±6.28	51.26±6.30	0.301
Height in cm	153.25±7.54	151.36±7.15	0.635

Both groups were comparable.

Table 2. Outcome

Variable	Study group	Control group	p-value
Hb in gm/dl	10.71±2.11	11.06±3.16	0.421
Hb drop in gm/dl	0.44±0.71	0.89±0.59	0.001
Placental delivery to the end of LSCS, mean blood loss in ml	282.31±35.61	341.21±39.21	0.001
End of LSCS to 2 hours post partum, mean blood loss in ml	69.35±19.35	135.21±35.21	0.001
Placental delivery to 2 hours post partum, mean blood loss in ml	362.32±22.32	470.21±39.32	0.001

The blood loss was significantly decreased in study group as compare to control group.

DISCUSSION

The Millennium Development Goal (MDG) of reducing maternal deaths by three quarters by the year 2015, a commitment that requires a reduction of the maternal mortality ratio by 5.5% each year. Because maternal hemorrhage accounts for over a quarter of deaths, an effective treatment for PPH would contribute importantly to MDG of reducing maternal mortality.[6]

The WOMAN Trial (World Maternal Antifibrinolytic Trial) aims to determine the effect of early administration of TXA on mortality, hysterectomy and other morbidities (surgical interventions, blood

transfusion, risk of non-fatal vascular events) in women with clinically diagnosed postpartum hemorrhage. The use of health services and safety, especially thromboembolic effect on breastfed babies will also be assessed. The trial will be large, pragmatic, randomized, double blind, placebo controlled trial among 15,000 women with a clinical diagnosis of postpartum hemorrhage.[6]

Continuous and constant efforts are made to unearth measures which will help in reducing bleeding following delivery whether by caesarean section or vaginal route. TXA which is known to help reduce surgical bleeding has been subject of many studies related to loss of blood following caesarean section. TXA achieves this by its antifibrinolytic effect by preventing binding of plasminogen and plasmin to the fibrin substrate. TXA also inhibits the conversion of plasminogen to plasmin by plasminogen activators.[7]

No side effects were observed in our study. A randomized case controlled prospective study was conducted on 100 women undergoing LSCS. TXA significantly reduced the quantity of blood loss from the end of LSCS to 2 hours postpartum as compare to control group (<0.001).[8] Similar finding have been observed in the present study.

In our study results are consistent with their findings, except that in our study, drop in hemoglobin concentration was statistically significant in two groups. Ferrer et al. identified three randomized controlled trials involving 461 participants. Out of the three trials two were those who had caesarean section delivery[9,10] and one who had spontaneous vaginal delivery.[11] Combining the results of the three trials, use of TXA significantly reduced mean blood loss by 92 ml (95% CI 76 to 109) compared to no treatment. There were no mortality and no thrombotic event was reported. The most frequently reported adverse effect of TXA was nausea although the increase was easily compatible with the play of chance (RR 4.63, 95% CI 0.23 to 95.14).[12]

CONCLUSION

A safe dose of TXA plays an effective role in reducing the blood loss during lower segment caesarean section without causing complications. Therefore, this drug can be used effectively in reducing maternal morbidity and mortality during LSCS and is devoid of any side effects.

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