Original Article

Comparison of Mean Blood Loss in Females Undergoing Normal Vaginal Delivery at Term with and without Tranexamic Acid.

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Objective: To compare mean blood loss in females undergoing normal vaginal delivery at term with and without tranexamic acid.

Methods: This randomized controlled trial was conducted in the department of Obstetrics and Gynecology, Unit-3, Jinnah Hospital, Lahore over a period of six months from 15-01-2015 to 14-07-2015. Two hundred patients (100 in each group) were included in this study. In group-A, patients were given 1gm of Tranexamic acid intravenous while in group-P (placebo) patients received 10ml of normal saline. Vaginal bleeding was examined immediately after the delivery of placenta and up to 2 hours of delivery. pre weighed pads were used to collect spilled blood and weighed again to calculate blood loss. The collected data was analyzed by using SPSS version 17.0. Quantitative variables like age, gestational age and blood loss was presented in form of mean ± SD. Both groups were compared for mean blood loss using t-test taking p value < 0.05 as significant.

Results: Patients were ranged between 18 to 30 years. Mean age of the patients was 23.49±3.27 and 24.09±3.67 years in group-A and P respectively. Mean gestational age was 38.98±1.25 weeks in group - A and 39.00±1.42 weeks in group-P (Table-2). Mean BMI in group-A was observed 21.96± 1.63 kg/m2 and in group p 21.49±1.64 kg/m2. Mean blood loss in group - A was 251.22±50.30 ml and group-P was 363.25±70.70 ml. Statistically significant difference between two groups was seen (p<0.001).

Conclusions: Tranexamic acid is effective in preventing PPH when compared with placebo.

Keywords: Postpartum haemorrhage, Tranexamic acid, Placebo,

Introduction

Primary postpartum hemorrhage (PPH) is the postpartum blood loss of 500ml or more in first 24 hours after delivery.[1] There is 3-5% risk of PPH for every woman going for delivery of baby although it may increase in the presence of certain risk factors.[2] In developing nations of the world, 28% of the total maternal deaths toll is due to PPH meaning thereby one case of PPH in 1000 childbirths.[3,4,5] Death of one woman occurs every 4 minutes due to PPH thereby leading to 10.4 million maternal every year. The contribution of Africa, Asia and Latin America is 99% in this tragic annual number of maternal deaths due to PPH. About ¼ to 1/3 maternal deaths occur due to PPH in these regions.[6,7] The economic burden is further accentuated by highly specialized health care facilities needed to deal 90% survivors showing the morbidity associated with PPH.[8] It is therefore extremely important not only to follow and refine the existing protocols but also search for newer remedies to deal with this scary complication of childbirth. A multidisciplinary protocol should be followed to deal with PPH, which not only ensure stabilization of patient in terms of hemodynamics but also identify and treat the cause and source of hemorrhage. Although a number of choices are available for the prevention of PPH but more advances in this regard are needed, especially to find safe, easy to use, and cost-effective regimens. An antifibrinolytic agent Tranexamic acid used extensively to prevent and treat blood loss also needs evaluation to assess its efficacy in PPH prevention. Tranexamic acid (TA) is effective in reducing blood loss after delivery. This effect can be achieved if TA is administered 2-3 minutes after delivery that is when the risk of PPH is high. Encouraging reports of TA use are there for the prevention of PPH not only in vaginal deliveries but also in cesarean deliveries. Although tranexamic acid use is quite wide but it still needs recommendations by world health organization. Moreover, its use in local settings is not a routine for the prevention of PPH due to lack of extensive confirmation. So far, The efficacy of tranexamic acid ranges from 75.8% to 90.7%, a substantial variation shown by available literature

Especially in developing countries like Pakistan. Results of this study may escort the concerned professionals towards a better management of PPH leading to prevention of associated morbidity and mortality.

Methods

This This randomized controlled trial was conducted at department of Obstetrics and Gynecology, Unit-3, Jinnah Hospital, Lahore over a period of six months from 15-01-2015 to 14-07-2015. Sample size of 200 cases; 100 in each group was calculated with 80% power of test and 5% level of significance. Non-probability consecutive sampling was used. All primigravidas in the age 18-30 years at term (gestational age > 37 weeks) with singleton pregnancy (on Ultrasound) in second stage of labour (full dilatation of cervix as assessed on pelvic examination) were included in the study from the labor ward of Obstetrics and Gynecology, Unit-3, Jinnah hospital, Lahore. Those having multiple pregnancy confirmed on ultrasound (USG), non-cephalic presentation (on USG), high risk patients i.e gestational diabetes (BSR>200mg/dl), PIH (BP > 14/90mmHg), pre-eclampsia (PIH with protein urea > 1 in dipstick), eclampsia (pre-eclampsia with convulsions) were excluded. Patients with history of sensitivity of tranexamic acid determined, patient with systemic problems like deranged LFTs (ALT > 40 IU, AST >40 IU), deranged RFTs (serum creatinine > 1.2mg/dl) or cardiac problem (history, abnormal ECG) were also excluded from the study. Approval of hospital ethical committee was taken. Two hundred patients who fulfilled the selection criteria were enrolled in the study after taking informed consent. Their demographic data (name, age and gestational age) was recorded. All the patients were given 10 IU oxytocin intravenously immediately after the delivery of anterior shoulder of fetus and then they were randomly divided into two equal groups by using simple random allocation using lottery method. In group-A (TA), patients were given 1gm of Tranexamic acid intravenously, while in group P (placebo), patients received 10ml of normal saline. Vaginal bleeding was examined immediately after the delivery of placenta and up to 2 hours of delivery. The amount of blood loss was measured by weight method (using soaked pads). All this information was recorded on proforma (attached). The collected data was analyzed by using SPSS version 17.0. Quantitative variables like age, gestational age and blood loss was presented in form of mean ± SD. Both groups were compared for mean blood loss using t-test taking p value < 0.05 as significant. Data was also stratified for age and body mass index (BMI).

Results

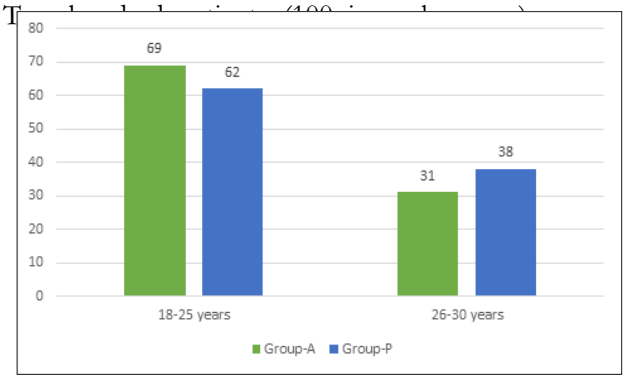

Fig-1: Comparison between two group regarding age of cases

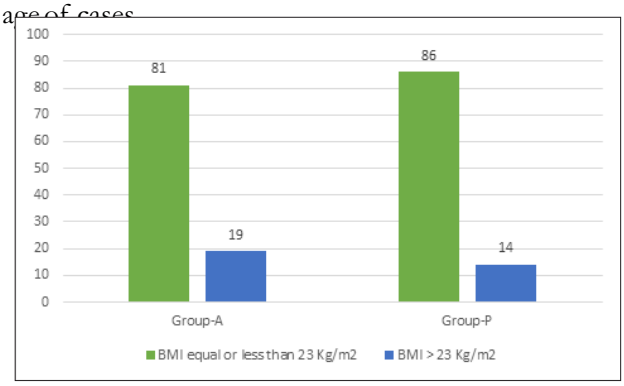

Fig-2: Comparison between two group regarding BMI of cases

Table-1: Comparison of blood loss between the two groups.

Group	Blood Loss (ml) Mean	SD
Group-A (Tranexamic Acid)	251.22	50.30
Group-P (Placebo)	363.25	70.70
P value <0.001		

Table-2: Stratification of the cases with regard to BMI.

BMI Group	Blood Loss (ml) Mean	SD	p-value
Group-A (< 23 Kg/m2)	243.16	50.57	<0.001
Group-P (< 23 Kg/m2)	367.66	75.62	
Group-A (> 23.1 Kg/m2)	269.16	45.50	<0.001
Group-P (> 23.1 Kg/m2)	356.05	62.13	

included in this study. Patient age range was between 18 to 30 years. Mean age of the patients was 23.49±3.27 and 24.09±3.67 years in group - A and P respectively. Distribution of cases by age and BMI is presented in **Fig-I&II** respectively. Mean gestational age was 38.98±1.25 weeks in group- A and 39.00±1.42 weeks in group-P. Mean blood loss in group - A was 251.22±50.30 ml and group-P was 363.25±70.70 ml. Statistically significant difference between two groups was observed with a p- value <0.001**(Table-I).**Stratification with regard to BMI was also carried out **(Table-II)** which showed a statistically significant difference of blood loss between the two groups in each class of body mass index. However the results in each group ie A and P were comparable in the two groups of high and low BMI . there was no significant difference between them.

Discussion

Postpartum hemorrhage imparts significant burden to maternal morbidity and mortality worldwide.[10,11] In fact, PPH is of biggest concern about maternal death if we talk about the developing countries like Pakistan. Multiparity, history of retained placenta, antepartum hemorrhage, multiple gestations, macrosomia, hypertension during pregnancy, instrumental deliveries, prolonged 3rd stage of labor, induction and augmentation of labor with prostaglandins and oxytocin. Most of the times, it is possible to prevent this third stage complication by suitable measures to prevent hemorrhage.[12,13,14]

Antifibrinolytic agents have been used to reduce blood loss during various surgical procedures. It is an antifibrinolytic agent which blocks the lysine-binding site of plasminogen to fibrin. Consequently, clot break down and fibrinolysis is inhibited leading to reduction in bleeding. The effect of plasminogen and fibrin degradation products released due to placental separation may also be counterbalanced by TA.[15]

Current study demonstrated that the mean calculated blood loss was significantly lower in the TA group than in the placebo group (p<0.001). These results are consistent with the results of the two previous studies. Yang et al used TA for preventing postpartum blood loss after normal vaginal delivery in 400 primiparous women in China. In their study, women were randomized into four groups: 1g of TA, 0.5 g of TA, amino methyl benzoic acid and a placebo. TA was given intravenously 23 min after the delivery and 10 units of oxytocin was injected immediately post - delivery. Outcomes of our study are supported by Yang et al. They also reported that the mean total blood loss from fetal delivery to 2 h postpartum and also the mean of blood loss from placental delivery to 2 h postpartum were significantly less in the intervention group than in the placebo group.[16]

Gungorduk et al conducted a double-blinded randomized controlled trial on 228 women in Turkey. They administered 1 g/10 ml TA intravenously, diluted with 20 mL of 5% glucose in the intervention group and 30 ml of 5% glucose in control group at delivery of the anterior shoulder in addition to standard active management of third-stage labour. Mean blood loss from birth to placental delivery was significantly less in the intervention group than that in the control group. [17] Literature search was made for comparison with local studies and the only Pakistani study available is by Shahid A et al. [18]That too is for the effect of TA in preventing PPH with cesarean section deliveries while our study was on the patients undergoing vaginal delivery. Going forward, there is a need of further studies especially focusing on the effect of TA after vaginal delivery, as so far only two RCTs are available in such scenario. Another important aspect, which needs to be evaluated, is its use in high risk patients which we excluded in the current study. The mean blood loss in patients above or below a BMI of 23 kg/m2 was almost the same. This in contrast with international studies where risk of PPH is more in obese people.[19,20]

Conclusion

Use of Tranexamic acid for the prevention of PPH is associated with significant reduction in mean blood loss after delivery. This can be an effective way to decrease the risk of PPH leading to an improved maternal health. Further studies, however, are needed to gauge the side effect profile of tranexamic acid so that the feasibility of its use is better assessed.

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