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ROLE OF PROPHYLACTIC TRANEXAMIC ACID IN REDUCING POSTPARTUM HEMORRHAGE IN FEMALES UNDERGOING CESAREAN SECTION

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ABSTRACT

Aim: To compare the frequency of postpartum hemorrhage among patients undergoing C-section with prophylactic tranexamic acid verses IV oxytocin**. Study Design:** Randomized controlled trial. **Place and Duration of Study:** Department of Obstetrics & Gynecology, Sandeman Provincial hospital Quetta from 1-3-2020 to 31-8-2020. **Methodology:** Three hundred and ninety eight females (198 in each group) undergoing lower segment cesarean section of 18-40 years of age were selected. Patients with previous history of anticoagulation therapy and adherent placenta like placenta accreta and previa were excluded. In group A TXA was given 1 gm before delivery of the fetus at the time of anesthesia while in Group B 10 units of I/V Oxytocin was given to all females before delivery at the time of anesthesia. Using cord traction method placenta was delivered in each female. Using operational definition PPH was measured by subtracting the weight of wet gauze from weight of dry gauze. **Results:** Group A women showed average age 28.19±4.46 years with average gestational age was 39.63±1.15 weeks and group B showed average age was 29.19±3.49 years and gestational age was 39.83±1.46 weeks. The group A showed average similarity of 3.40±0.98 and group B indicated 3.37±1.01. There was postpartum hemorrhage in 51 (25.76%) patients in Group A (tranexamic acid) while in Group B (IV oxytocin), it was seen in 88 (44.44%) patients with p-

value of 0.0001. **Conclusion:** There is less frequency of postpartum hemorrhage among patients undergoing C-section with prophylactic tranexamic acid as compared to IV oxytocin.

KEYWORDS: Frequency, Post-partum hemorrhage, Cesarean section, Prophylactic tranexamic acid.

INTRODUCTION

The condition of excessive bleeding after the birth of a child is known as Postpartum hemorrhage (PPH). in this condition blood may be lost, irrespective of the route of child birth, it is more than 500 ml after normal vaginal birth and more than 1000 ml after cesarean section is considered to the high extent.[1] Postpartum hemorrhage has been evidenced to be the fore most reason of maternal demises throughout the world.[2] it was observed that 25% maternal deaths globally are due to PPH. Besides mortality, PPH may cause serious morbidity like coagulopathy, renal shutdown and fertility loss. And also metabolic abnormalities due to symptoms of adult respiratory distress syndrome, shock, and pituitary gland damage owing to lack of oxygen (Sheehan's syndrome).[3]

The loss of blood may also be caused by uterine atony, placenta problems such as placental abruption, retained placental tissue, rupture of uterus, coagulopathy, malformation of vessels and lower genital tract laceration.[3] It is believed that the deaths related to PPH can be prevented by taking preventive measures and timely treatment. The treatment and prevention of PPH is the indication of an important move towards the health strengthening of women during childbirth.[4]

The strategies applied for the treatment of PPH are first- line and second-line cares. First-line treatment strategy is the traditional control of PPH through uterotonic medications (oxytocin or prostaglandins) while second-line treatment strategy are uterine packing, stepwise de-vascularization and external uterine compression sutures or embolization of the uterine artery.[5,6] The failure of conservative management often leads to obstetrical hysterectomy, and today, Hysterectomy is the most popular process for the control of sever PPH.[7] Postpartum hysterectomy is linked with short-term and long-term difficulties such as loss of blood, other organ damage, decreased wound healing, loss of fertility and risk of infections.[8]

The medication after the birth that indicates effectiveness for the inhibition of PPH is only uterotonics.[2] Tranexamic acid (TXA), an anti-fibrinolytic agent, has also been assessed as a

highly helpful supplement for both management and prevention as its intended action of mechanism in PPH supplements that of uterotonics, and as it was shown to reduce the loss of blood such as bleeding in trauma victims, menstrual blood loss, and elective surgery.[9] Prophylactic TXA effectively reduces the loss of blood, particularly postpartum hemorrhage, and severe postpartum hemorrhage induced before cesarean skin incisions in women undergoing cesarean delivery.[10]

A study performed in 2014 showed that the prevalence of postpartum hemorrhage was slightly lower in the research community (31.1 %) than in the experimental group (63.2 %), p-value < 0.05.[11] More findings suggested that PPH was ominously lower in the TA group than in the control group, i.e. 20.45 % vs. 31.39 %, p-value <0.05.[12]

Patients and Methods

This randomized controlled trial was conducted at Department of Obstetrics and Gynecology, Sandeman Provincial Hospital Quetta from 1-3-2020 to 31-8-2020 and comprised 396 women. They were distributed into two groups; group A TXA was given 1 gm before delivery at the time of anesthesia and Group B 10 units of I/V oxytocin was given to all females before delivery at the time of anesthesia. Females with gestational age of 37-42 weeks aged 18-40 years, both primigravida and multigravida, planned for C–section, ingle ton pregnancy and Hb ≥11.5 were included. All females with previous history of anticoagulation therapy, sensitive to TXA and USG findings of adherent placenta like placenta accrete and previa were excluded. Using cord traction method placenta was delivered in each case. Using operational definition PPH was measured by subtracting the weight of wet gauze from weight of dry gauze. The data was entered analyzed through SPSS–22.

RESULTS

The age range was from 18-40 years. The Group A of women showed average age 28.19±4.46 and Group B of women indicated the average age 29.19±3.49. Most of the patients 291 (73.48%) were between the ages of 18 and 30 years. The mean gestation age was 39.63±1.15 weeks for group A and 39.83±1.46 weeks for group B. Most of the women, 227 (57.32%) were between 40 to 42 weeks of gestation. The average equivalence of group A was 3.40±0.98 with group B being 3.37±1.01 (Table 1). There was postpartum hemorrhagein 51 (25%) patients in Group A (Tranexamic Acid), while in Group B (IV oxytocin), it was observed in 88 (44%) patients with a p-value of 0.0001 (Table 2).

Table 1: Demographic information of the patients (n=396).

Variables	Group A		Group	
	No.	%	No.	%
Age (years)				
18-30	149	75.25	142	71.72
31-40	49	24.75	56	28.28
Gestational age (weeks)				
37-39	89	44.95	80	40.40
40- 42	109	55.05	118	59.60
Parity				
Primiparous	57	28.79	50	25.25
Multiparous	141	71.21	148	74.75

Table 2: Comparison frequency of postpartum hemorrhage among patients undergoing C-section between both Group(n=396).

Postpartum hemorrhage	Group A		Group B		P value
	No.	%	No.	%	
Yes	51	25.76	88	44.44	0.0001
No	145	74.24	110	55.56	

DISCUSSION

Prohaemostatic medicines like TXA have a complimentary biochemical hemostatic impact on well-proven uterotonics, particularly oxytocin. Systemic anti-fibrinolytic agents are commonly used for surgery. Mostly in surgery, the systematic anti-fibrinolytic agents are used. A controlled trial of anti-fibrinolytic agents was analyzed randomly and comprehensively in elective surgical patients reported 211 random planned trials.[13] It resulted that aprotinin has decreased 34% transfusion chances of blood, 39 % TXA. TXA is analogous to lysine which makes attachment between fibrinolysis and plasminogen. The prevention of plasminogen and plasmin function may affect the clot development. It is active 10 times more than amno-caproic acid.[14,15] It shows that TXA is limit to loss of blood of uterine in non-surgical condition. A research conducted on women affected with menorrhagia has shown a decrease in average loss of blood at menstruation among those whose treatments were done with TXA.[16] A clinical trial of TXA was examined randomly for PPH treatment which has indicated that a high TXA dose decreases the loss of blood in women treated with PPH.[17] Various RCTs tested the prophylactic role of TXA and showed reduction in blood loss in women treated with PPH.[18–20]

The age ranges from 18 to 40 years in this research study with an average age of 28.76±4.12 years. Group A women average age was 28.19±4.46 years while group B women mean age

was 29.19±3.49 years. However, most of the patient's ages were in between 18 and 30 years. The result of this study showed similarity with Yaqub et al.[21] research study in which a large number of patients were in between 26 and 30 years. Khamaisheh et al[22] study indicated 28 years' average age in PPH patients. Conversely, Nizam et al[23] and Ferrazzani et al[24] studies showed 35 and 36 years' average age respectively in which most of the patients age was greater than 31 years. The age of gestation ranged from 37 to 42 weeks with average age 39.71±1.25 weeks of gestation. Group A showed average gestational age 39.63±1.15 weeks while 39.83±1.46 weeks in group B. A large number of 227 patients showed gestation age 40 to 45 weeks. From this, it is concluded that postpartum hemorrhage danger rises in patients with greater age of gestation. Theseoutcomes are also steady with the consequences of Yaqub et al[21] and Tirumuru et al.[25]

In this study, 51 (25.76 percent) patients had postpartum hemorrhage in Group A (tranexamic acid) while 88 (44.44 percent) patients with p-value 0.0001 had postpartum hemorrhage in Group B (IV oxytocin). A research paper published in 2014 showed that the effect of postpartum hemorrhage was substantially lower in the study group (31.1 per cent) versus the control group (63.2 per cent), p-value < 0.05.11 One more study reported that PPH was meaningfully lesser in the TA group than in the control group, i.e. 20.45 per cent versus 31.39 per cent, p-value <0.05.[12]

A research has indicated a greater reduction in the loss of blood from placental delivery to the time of surgery: 347.17 ml in the group of study while 517.72 ml in control group (p<0.001). The drop and post-surgery percentage of hemoglobin was also analyzed. The drops of hemoglobin were more than 10% in study group while 39 % in group had higher than 10% fall in hemoglobin (P<0.01).[26] The research conducted by Movafegh et al[27] indicated lesser average loss of blood in the study group (TXA 10mg/kg) in both post-operative and intra-operative periods. Goswami et al[20] also found a momentous variance between pre and post-operative hemoglobin by forming two study groups and one control group.

Abdel-Aleem and colleagues[28] studied 740 respondents randomly and found a considerable reduction in average loss of blood for 2 hours postoperatively. The study conducted randomly on 180 primi parous women by Gai and colleagues[29] indicated protection and efficacy. While study performed randomly by Mayur et al[19] on 100 LSCS women and also showed similar effect and showed no any considerable difference between the two groups in the length of operation and signal for surgery. Senturk et al[30] also found an important reduction

in the loss of blood by studying 20 ml of TXA diluted with 20 ml of 5% dextrose. Wang et al[31] conducted the study on 11 RCTs for determination of TXA effectiveness showed an important variation in average loss of blood, in hemoglobin and in need of blood transfusion between groups.

A meta-analysis, released as Cochrane Study, examined the efficiency of TXA in minimizing postpartum blood loss.[32] TXA was found to minimize postpartum loss of blood. However, it covered findings on both birth by vagina and CD, and did not contain current RCT.[33] Faraoni et al[34] and Heesen et al[35] released meta-analyses assessing the prophylactic effectiveness of TXA in women at low risk of postpartum haemorrhagia. Both TXA demonstrated a decrease in port-partum loss of blood. Inappropriately, these two meta-analyses did not cover all publicly usable caesarean RCTs, thus had lower amounts, which also included vaginal delivery tests.

A relative study was performed to study the impact of inj. TXA for the loss of blood before and in the course of caesarean delivery.[36] The tranexamic group showed average age 23.40±3.06, and the control group indicated the average age 23.59±3.56 while 64% drop was observed in the ranges of aged 21-25 years. In gravida 2 is the bulk of patients in both categories (Group A 65% and Group B 64%) with mean 2.17±0.65 for the sample group and 2.2±0.56 for the control group. The intraoperative loss of blood was smaller in the sample community than in the test group 375±69 vs 410±79.9 relative to the blood loss between two groups which is statistically important. The average postpartum of loss of blood was also analytically important in the sample population relative to the test group 52±30 versus 131±42. The gap in Hb percent before and one day after CD was analytically significant. The discrepancy between preoperative and postoperative Hb values 1.34±0.15 and 1.44±0.88 in the sample and control group with an analytically relevant P value of 0.003, respectively.[36]

One hundred and twenty women having singleton pregnancy were casually allocated to obtain either one-gram intravenous TA or placebo in addition to 10 IU oxytocin after fetus delivery. The mean total loss of blood (519 (320) vs 659 (402) mL, P = 0.036) and measured the loss of blood from placental delivery to 2 h postpartum (69 (39) vs 108 (53) mL, P < 0.001) was ominously lesser in the intervention group then control group. There was no considerable dissimilarity in terms of loss of blood from fetus delivery to placental expulsion among numerous groups. The rate of loss of blood > 1000 mL was lower in the TA group (7% vs. 18%, P = 0.048).[37]

The results of the systemic review of RCTs assessing impact of anti-fibrinolytic agents in patients with elective surgery showed that the risk of blood transfusion was decreased by 39% {RR = 0.61 [95%] CI 054-0.69]}, and by 1.1 units (95%) {RR = 0.61 [96% CI 0.58–0.40]}, respectively. TXA decreases the reoperation requirement owing to bleeding, though diversity was not analytically important. The elevated risk of thrombotic events has no evidence. TXA showed this positive effect irrespective of the kind of surgery including hepatic, urological, orthopedic, cardiac, and vascular).[38] A very recent RCTs meta-analysis particularly assessing the impact of preventive TXA administration detected 129 RCTs like 10,488 randomized participants.[39]

CONCLUSION

There is less frequency of postpartum hemorrhage among patients undergoing C-section with prophylactic tranexamic acid as compared to IV oxytocin. So, we recommend that its use should be encouraged in routine use in cesarean section in order to reduce postpartum hemorrhage as well as related morbidities.

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