IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 5 Ver. I (May. 2015), PP 08-11
www.iosrjournals.org

Role of Tranexamic Acid in Control of Blood Loss during and After Caesarean Section

Dr. G. Chandrakala MS (OBG), Dr.M.C.Venkateswarlu MS (GS)

Abstract :
Objective : *To evaluate the efficacy and safety of Tranexamic acid in the reduction of blood loss during and after caesarean section. This study was conducted during period of two years.*
Methods*: This is a prospective and randomized study consisting of 200 patients undergoing caesarean section. This included 100 cases from study and 100 cases from control group. Both primigravida and primipara previous one caesarean section were included.*
Result *: In present study that tranexamic acid significantly reduced bleeding form placental delivery to 2 hours post partum 363.7 ml in study group versus 430.2 ml in control group. In the study group total blood loss was reduced by 76.8ml as compared with that of the control group. P value 0.0038.*
The mean value of the hb% and PCV in the study group before C/S 10.11gm % and 33.7% after C/S 9.05gm% and 31.16% The mean value of the Hb% and PCV in the control group before C/S 10.06gm% and 34.2% after C/S 8.46gm % and 28.71%.Side effects of drugs are like nausea in 10% cases , vomiting in 45 cases no other side effects are observed.
Conclusion: *Tranexamic acid statistically reduces the extent of bleeding from placental delivery to 2hrs postpartum and its use was not associated with any side effects as complications. Thus tranexamic acid can be used safely and effectively to reduce bleeding resulting from caesarean section.*
KeyWords*: caesarean section, tranexamic acid, blood loss during and after surgery*

I. Introduction

The caesarean section rate has increased in many areas. Delivery by caesarean section can cause more complications than normal vaginal delivery and one of the most common complications is haemorrhage.

Tranexamic acid is an inhibitor of fibrinolysis. It has been routinely used for many years to reduce haemorrhage during and after many surgical procedures. Tranexamic acid to inhibit fibrinolysis and having no apparent effect on blood clotting parameters.

Drug category: Antifibrinolytic
: Antihaemorrhagic
: In pregnancy- FDA Pregnancy category B'

Clinical Efficacy Of Tranexamic Acid:
Gynaecological and Obstetrical indications:
1. Menorrhagia
2. IUCD Induced menstrual blood loss
3. Reducing blood loss during conisation of the cervix and amputation of cervix
4. Tranexamic acid prevents spontaneous abortion
5. Tranexamic acid reduces perinatal mortality in pregnancies complicated by placental bleeding
6. Postpartum haemorrhage
7. During and after abdominal and vaginal surgery.

Contraindications: Hypersensitivity to the drug, Subarachnoid haemorrhage, renal failure, Haematuria
Adverse Effects:
Adverse effects are rare and limited to **Nausea, Vomiting, Diarrhoea, Allergy to drug, Thrombophlebitis at site**

Aims And Objectives: To evaluate the efficacy and safety of Tranexamic acid in the reduction of blood loss during and after caesarean section. This study was conducted during period of two years.

II. Materials And Methods

This is a prospective and randomized study consisting of 200 patients undergoing caesarean section. This included 100 cases from study and 100 cases from control group. Both primigravida and primipara previous one caesarean section were included.

Selection Criteria:

1. Term primipara with singleton delivered by C.S
2. Term primigravida
3. Regular perinatal care
4. Adherence to research regulations
5. Informed consent obtained

Exclusion Criteria:

1. Severe medical and surgical complications involving the heart, liver, kidney, brain, and blood disorders
2. Allergy to Tranexamic acid
3. History of thrombolic disorders
4. Abnormal placenta such as placenta previa, placental abruption.
5. Pregnancy related complications- severe pre eclampsia, multiple pregnancies, and poly hydramnios.

Mode Of Administration Of Drug:

Study group: 10 minute before giving incision inj. Tranexamic acid 1 gm is diluted with 20ml 5% dextrose and it infused IV Slowly over 5 minute

- After delivery of baby oxytocin 20 units IV Drip was given

Control Group: TRANEXAMIC acid was not given, but Oxytocin 20 units drip given as in study group.

Clinical Observations : VITAL SIGNS- HR/ RR/BP Were checked before administration of Tranexamic acid during placental delivery and after administration of drug, complications also noted and recorded in the proforma

The Extent Of Post Partum Blood Loss:

The blood loss was measured by weight and volume during two periods
Following placental delivery to end of caesarean section and from end of caesarean section to 2hrs postpartum.

Blood Collection And Calculation:

Blood was collected via a suction container (the volume was measured) and soaked gauze, pads, and operation table sheet were weight
The study ignored estimates of amniotic fluid and bleeding that occurred prior to placental delivery.

Calculation Of The Quantity Of Blood:

Quantity of blood (ml)- Weight of all materials after surgery- weight of all materials prior to surgery/ 1.05
+ The volume included in the suction container after placental delivery.

III. Observations And Results

The various features of the study included age of the patient, Height, weight, gravida and gestational age. The results were analysed

Table 1 Patient characteristics for study and control group

Groups	Gravida	Age	Height	Weight	Gestational age
Study 100 cases	1	20	153.9	66.6 kgs	40.3
	2	22.4	152	66.2kgs	38.2
Control 100 cases	1	21	152.8	62.71kgs	40.1
	2	22	152.7	68.2kgs	39.3
P-Value	0.504	0.850	0.308	0.432	0.421

TABLE 2 Comparison Of The Extent Of Blood Loss In The Study And Control Groups

Group	Blood loss from placental delivery to the end of C/S (ml)	The end of C/S to 2 hrs postpartum (ml)	Placental delivery to 2 hours postpartum (ml)
Study group	315.66 ml	39.07 ml	353.92 ml
Control group	363.74 ml	71.12 ml	430.21 ml
P-value	0.068	0.022	0.0038

TABLE 3 Vital signs before and after Tranexamic Acid Administration

Vital signs	Prior	2 hours After
Temperature	98.4º F	98.4º F
Pulse rate	80/Min	84/Min
Respiratory rate	16/min	16/Min
SBP	114/mm Hg	114/mm Hg
DBP	74/mm Hg	76/mm Hg

TABLE 4 Comparision of Hb% and PCV in control and study Groups before and after c/s

		Before C/S	After C/S
Study Group	Hb%	10.11 gm%	9.05 gm%
	PCV	33.7%	31.16%
Control Group	Hb%	10.06 gm%	8.46 gm%
	PCV	34.2%	28.7%

TABLE 5 Mean levels of CBC, LFT and RFT Prior and after Tranexamic Acid Administration

Investigation	Prior	After
BT	2'5"	2'40"
CT	3'40"	3'356"
WBC	7150 cell/cumm	8200 cell/cumm
Platelet	3.052 laksh/cumm	3.36 laksh/cumm
Ser.creatinine	0.8 mg/dl	0.8 mg/dl
Bl.Urea	29 mg/dl	28 mg/dl
Ser.Bilirubin	0.4 mg/dl	0.5 mg/dl
SGOT	50U/L	55U/L
SGPT	16 U/L	23 U/L
AKP	259 U/L	193 U/L

TABLE 6 Complications observed in study group of the administration of Injection Tranexamic Acid

Nausea	10%
Vomiting	4%
Diarrhoea	Nil
Thrombophlebitis at Injection site	Nil
Drug allergy	Nil
Hypotension	Nil
Deep Vein thrombosis	Nil

IV. Discussion

Tranexamic acid exerts its antifibrinolytic effect by blocking the lysine binding locus of the plasminogen and plasmin molecule, there by preventing the binding of plasminogen and plasmin to fibrin substrate. Tranexamic acid also inhibits the conversion of plasminogen to plasmin by the tissue plasminogen activators (2) it has been used in the treatment of bleeding for many years

During placental delivery, fibrinogen and fibrin are rapidly degraded; whereas plasminogen activators and fibrin degradation products (FDP) increase due to action of the fibrinolytic system. This activation can lost up to 6_10 hours postpartum causing more bleeding.

The table -1 shows the patients characteristics in the two groups were similar with no statistically difference between the two groups.

While there was no statistical difference in the quantity of blood loss from the time of placental delivery to the end of caesarean section between the two groups (P=0.068), the total quantity of blood loss from the end of caesarean section to 2 hours post partum was significantly decreased (P=0.002) in the study group compared with the control group.

The total quantity of blood loss from placental delivery to 2 hour post partum was also reduced in the study group with a statistical difference between the two groups (P= 0.003),.

The haemoglobin and red blood cell number decreased slightly after birth in the two groups but there was no statistical difference white blood cells and platelets increased slightly in both groups but there was no obvious difference. There was no significant difference in the urinalysis between the two group other laboratory

investigations revealed that SGOT, SGPT slightly increased but not significantly, there was no change in bilirubin. Alkaline phosphatase decreased, and these changes were similar for both groups. There was no significant change in serum creatanine and blood urea in either group.

In present study that tranexamic acid significantly reduced bleeding form placental delivery to 2 hours post partum 363.7 ml in study group versus 430.2 ml in control group. In the study group total blood loss was reduced by 76.8ml as compared with that of the control group.

This was most marked in the second period from end of caesarean section to 2 hours post partum with 32.05 ml reduction in blood loss. There were no significant abnormal vital signs following tranexamic acid administration.

Tranexamic acid also reduced the incidence of post partum blood loss. There was no episode of thrombosis in the study group. When the anti-fibrinolytic drug tranexamic acid is administered, the increased risk of thrombosis should be considered, especially in the caesarean section post partum population suahberg and co workers reported 67 cases treated by tranexamic acid because of abruption placentae, and thrombosis occurred in none of these cases.

Nausea found in 10% of cases and vomiting in 4% cases, no other side effects were observed in study group. There were no side effects in the neonate.

All data demonstrated that tranexamic acid can be used safely without increasing the occurance of thrombosis uterine contractility was not effected by the drug the optimum results were obtained when the drug was given 10 to 15 minutes before giving the incision.

There was study conduced by Ming –Ying Gai etal in department of obstetrics and gynaecology of peking union medical college hospital

Comparison of present study with Ming-Ying Gai et al, the extent of blood loss in study and control groups.

	Ming ying gai et al study			Present study		
	Study group	Control group	P-Value	Study group	Control group	P-Value
No of cases	91	89		100	100	
Blood loss from placental delivery to end of C/S (Ml)	322.26± 148.15	358.34± 148.07	0.063	316.66ml + 149.04	363.74ml + 148.0	0.068
The end of c/s to 2hr post partum	42.75± 40.45	74.25± 77.06	0.001	39.07 + 47.10	71.12ml + 57.01	0.002
Total blood loss from placental delivery to 2h post	36436 ± 191.48	439.36± 191.48	0.002	353.92 + 158.09	430.21 + 196.8	0.0038

Above table shows the present study correlated with the Ming-Ying Gai et al., study, the blood loss from placental delivery end of Caesarean section statistically no significant change.

The end of C/S to 2hrs postpartum blood loss significantly reduced.Total blood loss from placental delivery to 2hrs postpartum statistically reduced. Present study co related with the ming ying gai et al study.

V. Conclusion

Tranexamic acid statistically reduces the extent of bleeding from placental delivery to 2hrs postpartum and its use was not associated with any side effects as complications. Thus tranexamic acid can be used safely and effectively to reduce bleeding resulting from caesarean section.

Bibliography

[1]. Katsaros D, Petricevic M, snow NJ.tranexamic acid reduces postbypass
[2]. blood use: a double blind, prospective, randomized study of 210 patients. Ann thorac surg 1996; 61:1131-5.
[3]. Hoylaerts M , lijnen HR, colleen D studies on the mechanism of the antifibrinolytic a action of tranexamic acid biochim biohys acta 1981;673: 75-85.
[4]. Sunanberg L, astedt B, Nilsson IM. Abruption placetae treatment with the fibrinolytic inhibitor tranexamic acid. Acta obstet gynecol scand 1980;59:127-30.
[5]. Bekassy Z, Astedt B. treatment with the fibrinolytic inhibitor tranexamic acid. acta obstet gynacol scand 1990;69: 353-4
[6]. Zheng SR, Yang HX, et al. clinical study on the efficacy of tranexamic acid in reducing postpartum blood loss. Chin J obstet gynecol2001;36:59.
[7]. Merck Co.I. Hemotology and oncology; hemostsis and coagulation disorders [online].Available from URL:http:// .
[8]. Shore-lesserson L,Reich DL,Vela-cantons F et al., Tranexamic acid is reduces transfusions and mediasstinal drainage in repeat cardiac surgery.anesth analg 1996Jul:83-26.
[9]. Blauhut B,Harringer w. betttelheim P, et al., Comparison of the effects of the aprotinin & tranexamic acid on blood loss and related variables after cardiopulmonary bypass.J thorac cardiovasc surg 1994 Dec;108(6):1083-91.
[10]. Horrow JC ,Van Riper DF,Strong MD, et al .hemostatic effects of tranexamic acid and demopressin during cardic surgery.circulation 1991 Nov:84(5): 2063 -70.