Research Article

Tropical versus caudal ketamine/bupivacaine combination for postoperative analgesia in children undergoing infraumblical surgeries

Hanaa O. Ibrahim Abdelrahim, Josef Z. Attia and Ahmed K. Mohamed
Department of Anesthesia and Intensive Care Unit, Faculty of Medicine, El-Minia University

Abstract
Objective: is to examine the effectiveness of systemic versus systemic and local application of tranexamic acid during caesarean section in anemic patients as regard intraoperative blood loss , postoperative blood loss, transfusion requirements, Perioperative hematological parameters as well as possible side effects that can happen in the periopearative period. **Patients and methods:** This prospective comparative, single blinded, controlled study was conducted in El-Minia Maternity University Hospital during the period from September2015 to february2016, following approval from the local ethical committee and after obtaining written informed consent from guardians. The study involved 90 patients, ASA physical state 2, anemic with Hemoglobin between 7-10g%, who underwent cesarean section at term between 37 and 41 weeks. **Group S (systemic):** received 1gm Tranexamic acid in 20 ml intravenously before the skin incision and 20ml normal saline poured over the uterine scar after the closure of the uterus. **Group SL (systemic/Local):** received 1gm Tranexamic acid in 20ml intravenously before the skin incision and 1gm tranexamic acid in20ml normal saline poured over the uterine scar after the closure of the uterus. **Results:** Regarding to intraoperative blood loss, it was less amount in group S and group SL in comparison to group C but with no significant difference between group S and group SL. Postoperative blood loss in groups S and SL was less than postoperative blood loss in group C and there was no significant difference between S and Sl. **Conclusion:** We concluded that IV administration of TXA by dose mentioned above provides a satisfactory control of postoperatively blood loss in CS and that local administration dose not have extra effect in this regard.
Keywords: Tropical versus, tranexamic acid, infraumblical surgeries

Introduction
Postpartum hemorrhage (PPH), the leading cause of maternal mortality, is associated with up to 35% of maternal worldwide, the vast majority of which occur in low-income-countries, where a significant proportion of births still occurs in community settings (Kerr, Robbie, et al., 2016).

Anemia with obstetric hemorrhage can be life threatening and with its high prevalence, it adds to the mortality. Therefore we choose to perform our study in anemic patients (Horowitz et al., 2013).

A variety of drugs are available today to improve haemostasis and to reduce blood loss in multiple clinical syndromes: tranexamic acid, aprotinin, etamsylate, vitamin K1, conjugated estrogens, desmopressin and recombinant coagulation products. Haemostatic agents can act through different mechanisms, by improving primary haemostasis, or stimulatin gthrombin generation and/or fibrin formation, or inhibiting fibrinolysis (Wardrop et al., 2013).

In obstetric trials, TXA has been used both prophylactically during labor to reduce hemorrhage with cesarean section and as a treatment for PPH, once diagnosed. While these studies have been conducted in a variety of settings, in most studies, a substantial decrease in blood loss was reported (several hundred mL) (McClure, Elizabeth M., et al., 2015).

Patients and methods
This prospective comparative, single blinded, controlled study was conducted in El-Minia Maternity University Hospital during the

period from September 2015 to February 2016, following approval from the local ethical committee and after obtaining written informed consent from guardians. The study involved 90 patients, ASA physical state 2, anemic with Hemoglobin between 7-10 g% ,who underwent cesarean section at term between 37 and 41 weeks.

Group S (systemic): received 1gm Tranexamic acid (Trade Name: Hemoxamine, Manufactured by CID Company in EGYPT)in 20 ml intra-venously before the skin incision and 20ml normal saline poured over the uterine scar after the closure of the uterus.

Group SL (systemic/Local): received 1gm Tranexamic acid in 20ml intravenously before the skin incision and 1gm tranexamic acid in20ml normal saline poured over the uterine scar after the closure of the uterus.

Group C (Control): received 20ml of normal saline intravenously before the skin Incision and 20ml normal saline poured over the uterine scar after the closure of the uterus.

Intraoperative blood loss, postoperative blood loss, hematological parameters (such as hemoglobin levels, hemocrite levels, platelet count and prothrombin level), Transfusion requirements of blood poducts (Blood, Fresh Frozen Plasma and Platlets), Neonatal otcome and complications (such as hypotension, hyper-sensitivity, cerebral stroke, myocardial infar-ction, deep venous thrombosis, pulmonary embolism and postoperative seizure) were assessed.

Results

A total number of 90 patients were eligible for inclusion in this study, they were randomized in equal number to three groups each of them were 30 patients.

Patients characteristics are presented in table 7, the demographic data (age , weight, gravidity and operative time) in the three groups doesn't show any statistical significant difference.

The number of patients who received additional uterotonic agents was significantly higher in group C in comparison to group S and group SL. The number of patients who required blood transfusion was comparable between the three groups.

Table 1 summarizes perioperative blood loss. The intraoperative blood loss in group C (698± 124 ml) was significantly higher (P value < 0.05) than in group S (544±124ml) and group SL (604± 103 ml) however, there was no statistical significant difference (P value >0.05) between group S and group SL as shown in figure 12.

Postoperative blood loss was significantly higher in group C (285±14ml) than group S (225±26ml) and group SL (230±26 ml) (P value <0.05), however, there was no significant difference (P value > 0.05) between group S and group SL as shown in figure 13.

Regarding estimated Blood loss our result showed it was significantly higher in group C (703±103 ml) than in group S (482±171ml) and group SL (409±99 ml) (P value <0.05) however, there was no significant difference (P value <0.05) between group S and group SL as illustrated in figure 14 .

Table (1): Shows perioperative blood loss (Data are expressed as mean ± SD):

Variables	Groups			P Value		
	Group S (n=30)	Group SL (n=30)	Group C (n=30)	Group S&SL	Group S&C	Group SL&C
Intraoperative blood loss (ml)	544±124	604±103	698±124	0.54	0.01#	0.02#
Postoperative blood loss (ml)	225±26	230±20	285±14	0.11	0.033#	0.025#
Estimated blood loss(ml)	482±171	409±99	703±103	0.21	0.01#	0.01#

Significant difference between the groups.

Discussion

Obstetric hemorrhage is the world's leading cause of maternal mortality. Postpartum hemorrhage (PPH) accounts for the majority of these deaths1. The global maternal ratio of 402 deaths per 100,000 live births2 obscures the fact that 99% of these deaths occur in the developing world (Goswami et al., 2013).

Tranexamic acid is a synthetic derivative of the amino acid lysine. The antifibrinolytic activity is a result of reversible binding to plasminogen which prevents its interaction with fibrin. Generally, plasminogen binds to fibrin at a lysine binding site and is converted in the presence of tissue plasminogen activator to plasmin. Tranexamic acid blocks the lysine binding site and prevents access of plasminogen to fibrin molecules (McCormack, 2012).

TXA is widely in use in the field of obstetrics. Both antepartum and PPH are being treated by TXA extensively In their study, Ducloy Bouthors et al., demonstrated for the first time that TXA administered to women with overt PPH decreases blood loss and maternal morbidity. Prevention of PPH is another indication where TXA has been used. Varied doses of TXA ranging from 1 mg/kg to more than 100 mg/kg have been used in various surgeries . Even in studies involving LSCS, the doses used were either a bolus of 1 gm or 10 mg/kg intravenously(Goswami et al., 2013).

Regarding our study, we found there were no differences between the three groups in haemodynamic parameters: Blood Pressure (Mean, Systolic and Diastolic) heart rate and O2 saturation. This agrees with Prema, P2012.

Our results demonstrated that there were no differences between group S and group SL in the mean intraoperative blood loss. We also found that the mean intraoperative blood loss in group C was more than both groups S and SL and the difference was with statistical significance. This agree with (Goswami et al., 2013).

Our study demonstrated that Postoperative blood loss was less in both groups S and SL than in group C and the decline was significant. Also, the was no significant difference between groups S and Sl. This agrees with Buthors et al., 2011.

In disagreement with our study, Goswami, et al., 2013 reported that , there was no significant difference between the three groups (The two groups received TA and the placebo group) as regards the postoperative blood loss.

Unlike in other fields of surgery, there has been no data on the topical or intracavitary use of TXA in obstetrics possibly due to technical difficulties in hollow organs with an opening like a uterus. Their method has enabled this, and it is expected to deliver a high concentration of the agent atbleeding spots inside the uterus (Kinugase et al., 2015).

In our study, we found that Estimated Blood Volume (EBV) was lower in both groups S and SL than in group C and the decline was highly significant but there was no significant difference between groups S and Sl. This come in agreement with (Gungorduket al., 2011).

Our study showed that there was no significant difference between the three groups as regards the neonatal outcome. The 1 and 5-minute Apgar score of each neonate was above 7. This agrees with Gungorduket al., 2011.

Gungorduk, et al., 2011 also found that Significantly more women in the placebo group (48 [14.5%]) needed additional uterotonic agents

than those in the TA group (28 [8.5%]). This agrees with our study where group C needs significantly needed additional uterotonic agents more than both groups S and SL.

Regarding transfusion requirements, our study found no significant difference between the three groups in the requirement for blood transfusion. There were more patients in group C who needed blood than in both groups S and SL but the difference was not significant. This agrees with Goswami, et al., 2013.

In our results, no reports of hypotension, cerebral Stroke, hypersensitivity reactions, deep venous thrombosis, myocardial Infarction, pulmonary embolism and post operative seizures occurrence. This agree with Shahid, et al., 2013.

Conclusion

We concluded that IV administration of TXA by dose mentioned above provides a satisfactory control of postoperatively blood loss in CS and that local administration dose not have extra effect in this regard.

Also both IV and combined local IV TXA administration is better than placebo group in controlling intraoperative blood loss, postoperative blood loss and transfusion requirements of blood products.

The limitation in our study was number of patients included in each group, so we recommended to do the study over a large number of patients, using different doses of TXA especially in comparison local versus systemic application as there is no data found on this subject .

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