

Comparative Study between Intravenous and Intraumbilical Oxytocin as Active Management of Third Stage in Elective and Emergency Caesarean Section

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Abstract

Introduction: Obstetric hemorrhage is a much dreaded and dangerous complication. Prevention of postpartum hemorrhage depends on proper management of second stage and third stage of labor. This study attempts to evaluate the effect of oxytocin instillation through umbilical vein in reducing the blood loss and time taken for placental separation in caesarean section.

Methods: The study was an interventional study. Two hundred cases of caesarean section conducted at DR D. Y. PATIL HOSPITAL, PUNE were taken for the study. Patients undergoing caesarean section were divided into two groups randomly and allocation done on the basis of lottery system. Based on allocation one group was subjected to 20 units of intraumbilical oxytocin and other group received 20 units intra venous oxytocin drip in 500ml normal saline. Observer was blind (blood loss in ml and time for expulsion of placenta was measured by other). 100 cases of elective and 100 cases of emergency caesarean section were included in the study. Amount of blood loss and time taken for placental separation were observed.

Results: amount of blood loss and the time of placental separation was significantly less in the intraumbilical group compared to intravenous group

Conclusion: oxytocin is a gold standard oxytocic drug and newer route of administration of 20 units in 20 ml normal saline intraumbilically, immediately after the delivery of the baby in both elective and emergency caesarean section, reduce the duration of third stage of labor and reduces blood loss significantly.

Key words: Blood loss, caesarean section, intraumbilical, intravenous, Oxytocin, placental separation

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Introduction

Obstetric hemorrhage is a much dreaded and dangerous complication¹. Almost all obstetricians have encountered bleeding that progress to frank hemorrhage after a seemingly uneventful delivery.

Caesarean section rates are rising worldwide and becoming a cause of concern as it has been shown to be positively associated with maternal morbidity and mortality even after adjusting for risk factors^{2,3}.

Although maternal mortality has decreased considerably over the years, obstetric hemorrhage is still a leading cause of maternal deaths⁴. Approximately 4% of all pregnancies are complicated by postpartum hemorrhage⁵. Postpartum hemorrhage is defined as an estimated blood loss of more than 500ml in first 24 hours after delivery⁶.

Though 1000ml is taken as the cutoff point for caesarean section, many women may not tolerate this loss also. Postpartum hemorrhage may lead to increased maternal morbidity and mortality. Maternal mortality

may be increased due to the presence of infection, anemia, sub involution, failure to establish lactation, deep vein thrombosis⁷. Massive blood loss will lead to hypovolemic shock. This leads to morbidity and late squal Sheehans syndrome⁸.

Prevention of postpartum hemorrhage depends on proper management of second stage and third stage of labor⁹. The whole concept of third stage management has been revolutionized with the introduction of oxytocin in the second stage of labor by Davis and Boynton (1942)¹⁰.

They showed that administration of intravenous methergin in the late second stage brought down the postpartum blood loss to 120 ml and also reduced the duration of the third stage of labor to about 3 minutes. This study attempts to evaluate the effect of oxytocin instillation through umbilical vein in reducing the blood loss and time taken for placental separation in caesarean section.

The oxytocin with distilled water instillation in to the umbilical vein is a noninvasive, simple method for the management of blood loss in caesarean section.

Aims and Objectives of Study

- To study the effect of intraumbilical 20 units oxytocin and intravenous 20 units oxytocin on third stage of labour during caesarean section.

- To compare the amount of blood loss following intravenous oxytocin and intraumbilical oxytocin.
- To compare the time required for placental separation following intravenous oxytocin and intraumbilical oxytocin.
- To evolve a protocol for the active management of third stage by intraumbilical oxytocin as prophylaxis of atonic PPH in elective and emergency caesarean section.

Materials and Methods

The study was an interventional study. Two hundred cases of caesarean section conducted at DR D. Y. PATIL HOSPITAL, PUNE were taken for the study. The study extended over a period of two years from August 2013 to August 2015.

Patients undergoing caesarean section were divided into two groups randomly and allocation done on the basis of lottery system. Based on allocation one group was subjected to 20 units of intraumbilical oxytocin in 20ml normal saline and other group received 20 units intravenous oxytocin drip in 500ml normal saline. Observer was blind (blood loss in ml and time for expulsion of placenta was measured by other). 100 cases of elective and 100 cases of emergency caesarean section were included in the study.

Written informed consent was taken from each patient undergoing trial in the study along with ethical clearance from the ethics committee

Inclusion Criteria: Cases undergoing elective and emergency caesarean section in this institute were included in the study. All cases except those listed in exclusion criteria were included.

Exclusion Criteria:

Patient with the following medical disorders were excluded from the study:

1. Coagulation disorders, HELLP syndrome
2. Jaundice in pregnancy
3. Placenta praevia, abruption placenta,
4. Adherent placenta (percreta, increta)
5. Previous surgery on the uterus (myomectomy except caesarean section)
6. Heart disease in pregnancy
7. Rh negative pregnancy
8. Multiple pregnancy

Caesarean section done under spinal anesthesia and epidural anesthesia only are taken for the study. Patients given general anesthesia are not included in the study to maintain uniformity of sample and to avoid the effect of different type of anesthesia on blood loss.

Treatment Plan: All patients requiring emergency/elective caesarean section were admitted. Patients were counseled and consent taken. Patient shifted to operation theatre and lower segment caesarean section done. Delivery of the baby done and duration of the third stage of labor noted in all patients.

In Group I – 20 units of oxytocin is diluted in 500 ml of normal saline and was started soon intravenous after delivery of the anterior shoulder of the baby. Placenta with membranes was then removed in all cases with controlled cord traction after spontaneous separation.

In Group II – 20 units of oxytocin is diluted in 20ml of normal saline was instilled into umbilical vein soon after clamping the cord. Expulsion of the placenta was taken as the end point of the third stage. Placenta was removed in all cases with controlled cord traction after spontaneous separation.

The details of the third stage – appearance of fresh bleeding, expulsion of the placenta, and time of retraction of the uterus from the delivery of the neonate were recorded.

Routine protocols of active management of third stage of labour were practiced in both groups (except 10 units Pitocin IM). After the second stage, the blood loss both before and after expulsion of placenta was collected in suction apparatus and in pre weighed mops. The collected blood was immediately measured in a graduated plastic jar. Every effort was made to avoid contamination of the blood with liquor amnii.

Pre weighed mops are used and post operatively soaked mops were weighed. After the caesarean section, amount of blood and clots collected during toileting were also collected and measured separately. The neonate was weighted. The placenta was examined for any gross abnormality and weighted. The patients were monitored in postoperative period half hourly for two hours. Patients were monitored for tachycardia, hypotension and hypertension, uterus for retraction or relaxation, soakage of dressing and any excessive vaginal bleeding.

According to the literature, PPH is defined as bleeding more than 1000 ml in caesarean section. In our study if the blood loss exceeded 700 ml, we intervened as per routine protocols.

Parameters Studied – Mean blood loss, time of placental separation, and its association with the weight of neonate, parity, type of caesarean (elective/emergency) and socioeconomic status (according to kuppaswamy classification)

All statistical analysis was done using SPSS v11.5. A p-value <0.05 was considered statistically significant.

Results and Observations

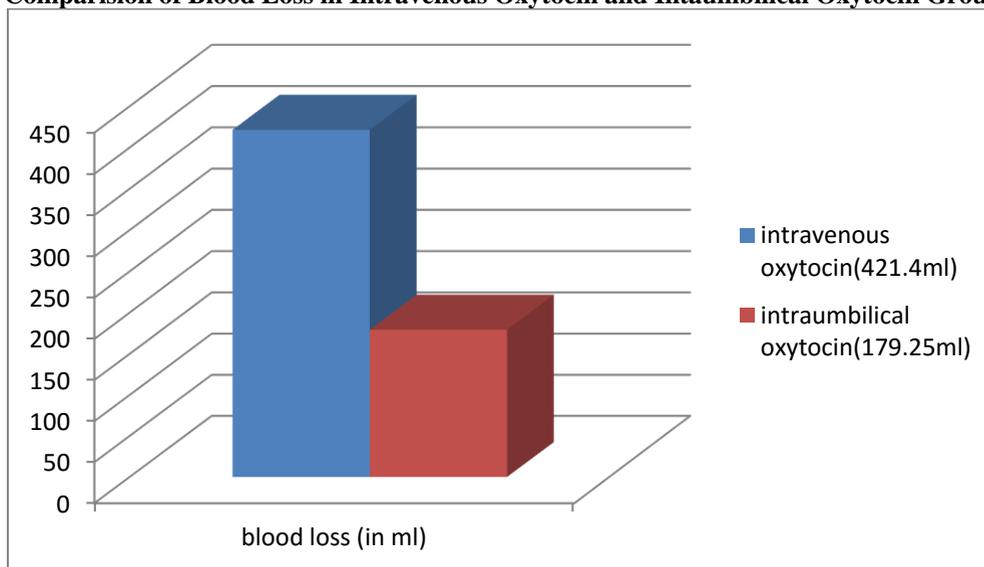
Table: Comparison of Blood Loss and Time of Placental Separation in Both Groups

| Groups | Blood loss (ml) | Time of placental separation | Complications |
|-------------------------------|-----------------|------------------------------|---------------|
| Intravenous oxytocin group | 421.40 | 4.32 | Atonic PPH |
| Intraumbilical oxytocin group | 179.25 | 1.29 | Nil |

Average blood loss in intravenous group was observed to be 421.40 ml and the time of placental separation was 4.32 min. One case was complicated by atonic PPH in intravenous group.

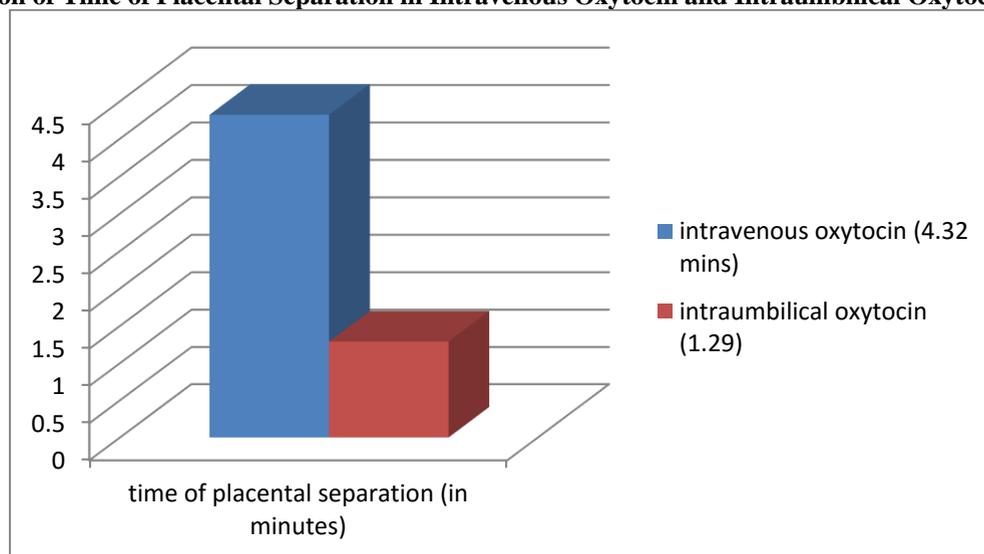
Average blood loss in intraumbilical group was observed 179.25 ml and the time of placental separation was 1.29 min. There was no complication in this group.

Comparison of Blood Loss in Intravenous Oxytocin and Intraumbilical Oxytocin Group



The above chart shows the comparison between blood loss in intra venous and intraumbilical group. Mean blood loss in intravenous group is 421.4ml and intraumbilical group is 179.25ml respectively.

Comparison of Time of Placental Separation in Intravenous Oxytocin and Intraumbilical Oxytocin Group



The above chart shows the comparison between time of placental separation between intravenous group and intraumbilical group. The mean time for placental separation in intravenous group is 4.32mins and in the intraumbilical group 1.29mins respectively. These are statistically significant.

Discussion

Obstetric hemorrhage can lead to massive blood loss that may endanger the life of the patient. Several factors may operate in the causation of obstetric hemorrhage, coagulation disorders and miscellaneous obstetric complications may cause severe bleeding. Among all these uterine atony predominates as the leading cause. Proper intra operative care has helped in the prevention of obstetric hemorrhage.

A total of 200 cases were recruited for the study. The aim being to prove the benefit of using oxytocic agent in the umbilical vein in the reduction of blood loss and reduced time of placental separation subsequently. The cases in the study were divided into two groups.

Intravenous group

20 units of oxytocin in 500 ml normal saline given intravenous immediately after clamping the cord (100 cases).

Intraumbilical group

20 units of oxytocin in 20 ml normal saline instilled into the umbilical vein immediately after clamping the cord. All the patients underwent caesarean section and the age of patients ranged between 19 and 38 years.

In group 1 using intravenous oxytocin the average blood loss was 421.40 ml. minimum blood loss was 300ml and maximum was 600ml. In group 2 using intraumbilical oxytocin the average blood loss was 179.25ml. The minimum blood loss was 150ml and maximum was 300ml. An attempt was made to compare the blood loss in two groups. It was seen that the average blood loss was 421.40ml in intravenous group and 179.25ml in intraumbilical group. These values are statically highly significant. Moreover, blood loss in intraumbilical group did not exceed 450ml. but in intravenous oxytocin group 34% cases had blood loss exceeding 450ml.

The average time taken for placental separation was 4 mins 30 sec in intravenous group and 1mins 30 sec in intraumbilical group.

Conclusion

Intrapartum and postpartum hemorrhage is an obstetric hazard that often requires emergency measures to prevent maternal morbidity and mortality. The result of this study has clearly established that oxytocin when administered intraumbilically caused a significant reduction in blood loss.

Significant reduction in the time taken for placental separation was noted with intraumbilical oxytocin

compared to intravenous oxytocin. Relation between amount of blood loss and duration of placental separation could be established. When the time for placental separation was longer amount was blood loss was also more. There were no cases of retained placenta in our study. This study once again confirms that oxytocin is a gold standard oxytocic drug and newer route of administration of 20 units in 20 ml normal saline intraumbilically, immediately after the delivery of the baby in both elective and emergency caesarean section, reduce the duration of third stage of labor and reduces blood loss significantly.

Conflict of Interest: None

Source of Support: Nil

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