



Obstetrics & Gynaecology

A STUDY ON EFFICACY OF INJECTION CARBETOCIN COMPARED WITH INJECTION OXYTOCIN AND TABLET MISOPROSTOL IN REDUCING BLOOD LOSS DURING CESAREAN SECTION

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ABSTRACT

Background: Postpartum hemorrhage is defined as blood loss more than 500ml during vaginal delivery and 1000 ml during C-section. In India, PPH accounts for 38% of maternal mortality. The main cause of haemorrhage at the time of delivery is uterine atony, therefore active management of the third stage of labour is recommended. The administration of uterotonic drugs during caesarean section has become essential to diminish the risk of PPH and improve maternal safety. **Method:** This is a prospective study. Pregnant women admitted to labour Ward for elective and emergency c- section with various indications were included after obtaining written informed consent in their own understandable language. 60 patients were taken for the study (study group-30 patients were given injection carbetocin and control group-30 patients were given injection oxytocin and tab misoprostol). In all cases thorough history, complete physical and obstetric examination, routine investigations including obstetric scan were carried out. Cesarean sections were done under spinal anesthesia. Amount of blood loss intraoperatively and postoperatively was noted. Hemoglobin values were checked preoperatively and postoperatively. **Results:** The blood loss was less in study group (415.67ml) compared to control group (582.20ml) with p value <0.001 (significant). Intraoperative uterine tone assessment showed 27 well contracted uterus in study group and 19 in control group which was significant. The mean difference between pre-op and post-op in study group was 0.71 and in control group was 1.36 with p value <0.001 (significant). **Conclusions:** Carbetocin is efficient in controlling blood loss and is associated with less need for further uterotonic agents or surgical haemostatic measures compared to Oxytocin and Misoprostol. Carbetocin produces prolonged uterine tetanic spasm during and post Caesarean delivery compared to Oxytocin and Misoprostol.

KEYWORDS : Carbetocin, Oxytocin, Misoprostol, Caesarean-delivery**INTRODUCTION**

ACOG (2017) redefined PPH as excessive blood loss following delivery (>500ml in vaginal delivery and >1000 mL in cesarean delivery) accompanied with signs and symptoms of hypovolemia.¹

It is the single main cause of maternal morbidity and mortality. Globally, PPH accounts for 35% of maternal mortality. In India, PPH accounts for 38% of maternal mortality.

The administration of uterotonic drugs during caesarean section has become essential to diminish the risk of PPH and improve maternal safety. Currently oxytocin is the uterotonic of choice in active management of third stage of labour²

Oxytocin is a nonapeptide hormone, a potent uterotonic with half-life of 3 minutes³. It can be given as IM injection and IV infusion. However large doses of oxytocin have many side effects like nausea, vomiting, hypotension, tachycardia, water intoxication, seizures, arrhythmias, pulmonary edema⁴

Misoprostol is a prostaglandin E1 (PGE-1) analogue, has potent uterotonic action with half-life of 20-40 minutes. It is stable at room temperature but the quality can be compromised by high humidity⁵. It is administered by oral, sublingual, rectal or buccal routes. It can cause side effects like hyperthermia, nausea, vomiting, headache⁶

Carbetocin is a synthetic oxytocin analogue with half life of 40 minutes. It has immediate action and acts for longer duration than oxytocin- IV route-60mins; IM route-120 mins. It is heat-stable formulation hence does not require refrigeration⁷. It is a single dose injection instead of infusion and can be given intramuscularly or intravenously.⁸

Oxytocin plus misoprostol and carbetocin (alone) – are associated with higher efficacy. However, the combination regimen is associated with increased side effects compared to carbetocin⁹

AIMS AND OBJECTIVES

The aims and objective of the study is to determine the efficacy of injection Carbetocin compared to injection oxytocin and tab misoprostol

MATERIALS AND METHODS

Source Of Data –Pregnant women admitted for delivery to labour room undergoing Cesarean section for various indication

Study Design– Prospective study

Study Site – Navodaya medical college research centre, Raichur.

Study Sample – 60 samples

Study Group -30 patients were given Injection carbetocin 100mcg IM/IV

Control Group -30 patients were given Injection oxytocin 10 IU IM/IV infusion and Tab misoprostol 800mcg rectal

Inclusion Criteria:

1. Women who are willing to participate in study with an informed valid consent
2. Pregnant women belonging to age group of 20-35 years

Exclusion Criteria:

1. Patient not willing for the study
2. Women with serious cardiovascular disorder, serious hepatic or renal disorder, coagulopathies
3. High risk Pregnancy with complications such as, placenta previa, placental abruption, or placenta accreta spectrum disorders
4. Pregnant women with history of Bronchial asthma or any respiratory disorders.
5. Patient with history of prostaglandin hypersensitivity

After the approval of institutional ethical committee for the study and obtaining written informed consent from each patient, 60 patients who fulfills inclusion and exclusion criteria were randomly selected to minimize bias and divided into study and control group equally.

In all cases thorough history, complete physical and obstetric examination, routine investigations including obstetric scan were carried out. Cesarean sections were done under spinal anesthesia.

Assessment Tools

Intra operatively, Palpatory method is used by the surgeon to identify any atonicity and to assess contraction and retraction of the uterus and need of any additional uterotonics .

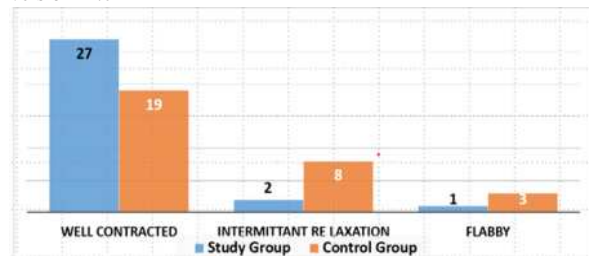
Estimation of blood loss during LSCS is done by measuring the blood volume after delivery of placenta in the graduated cylindrical suction jar and by weighing the sponges used during operation and pads used for 2 hours post operatively soaked with blood (1gm - 1ml)

Post-operatively change in haemoglobin percentage before and after operative procedure will be compared in both the groups by measuring haemoglobin percentage after 24 hours of surgery.

Post operative requirement of blood transfusion was noted. Post operatively side effects in both study and control group were noted.

RESULTS

Descriptive statistics has been done for all data. Master charts are plotted using Microsoft Excel and statistical software used is SPSS version 21.0



Graph 1- Bar Graph Showing Intra Operative Condition Of Uterus On Palpation After Giving Medications Between Study And Control Group

90%(27) of the patient had well contracted in study group whereas 63.3% (19) had well contracted uterus in control group. 3.33%(1) women had flabby uterus in study group compared to control group with 10%(3) had flabby uterus

Table 1- Comparison Of Blood Loss In Study And Control Group

Variables	Study group (Carbetocin) (n=30)		Control Group (Oxytocin+Miso) (n=30)		P Value
	Mean	+/- SD	Mean	+/- SD	
Intra operative blood loss (ml)	391.67	33.37	497.00	21.43	< 0.0001
Post op 2 hours blood loss (ml)	24.00	9.78	85.20	14.37	< 0.0001
Total blood loss (ml)	415.67	43.16	582.20	35.80	< 0.0001

Table 1 shows mean intra operative blood loss during C- section in study group was 391.67ml while in control group was 497.0 ml and the p value was <0.0001. Mean post operative 2 hours blood loss in study group was 24.0 ml and in control group was 85.20 ml and the p value was <0.0001. The mean blood loss in study group is 415.67ml and in control group was 582.2 ml. The amount of blood loss is significantly less in study group than control group with p value <0.0001

Table 2- Comparison Of Pre-operative And Post-operative Difference In Haemoglobin Percentage In Study And Control Group

Variables	Study group (Carbetocin) (n=30)		Control Group (Oxytocin+Miso) (n=30)		P Value
	Mean	+/- SD	Mean	+/- SD	
Before delivery	10.87	0.813	10.9	0.746	0.9
After delivery	10.15	0.79	9.5	0.727	< 0.0001
Difference	0.71	0.02	1.36	0.02	0.0016

The mean haemoglobin difference before and after LSCS in study group is 0.71 and in control group is 1.36. It was statistically significant with p value <0.001

DISCUSSION

Postpartum hemorrhage is one of the primary cause for maternal deaths (35%) throughout the world. Uterine atony is the major cause of it and this arise the need to study the efficacy of different regime of uterotonics for prevention and treatment of this condition.

In present study age, gravidity, parity and period of gestation of both

study and control group were similar and of no statistical significance

The mean blood loss in study group is 415.67ml and in control group was 582.2 ml. The amount of blood loss is significantly less in study group than control group

Larciprete et al¹⁰ found in their study that a single injection of Carbetocin appears to be more effective than a continuous infusion of oxytocin to prevent the PPH, with a similar hemodynamic profile and minor antidiuretic effect

In the present study, the mean haemoglobin difference before and after LSCS in study group is 0.71 and in control group is 1.36 (statistically significant) and is in correspondence with Ali AA et al.¹¹ where haemoglobin level and haematocrit value preoperative and 48 hours postoperatively after elective caesarean delivery had a significant difference

In our study, 4 patients required blood transfusion in study group & 8 patients required blood transfusion in control group

In present study, most commonly seen side effect was chills 26.6% (8) in control group whereas it was 10% (3) in study group. Tachycardia was seen in 20% (6) in control group and 6.66% (2) in study group. Fever was seen in 20% (6) in control group and 6.66% (2) in study group. Headache was seen in 6.66% (2) in study group where as it was seen in 3.33% (1) control group which was similar to the findings seen in Elgazayerli W.S.¹² where fever, palpitations, metallic taste was noted in oxytocin and misoprostol groups

CONCLUSION

Carbetocin is superior to Oxytocin and Misoprostol in minimizing incidence of excessive blood loss due to atonicity in patients undergoing caesarean delivery. Carbetocin produces prolonged uterine tetanic spasm during and post caesarean delivery with lesser side effects and is stable at room temperature compared to Oxytocin and Misoprostol.

Carbetocin is efficient in controlling blood loss and is associated with lesser need for further uterotonic agents and blood transfusion. Carbetocin reduces the requirement for surgical interference / obstetric hysterectomy and thus improve the maternal mortality and morbidity.

REFERENCES

- William's obstetrics- 26th edition
- Ian Donald's practical obstetric problems-8th edition
- Thomas JS, Koh SH, Cooper GM. Haemodynamic effects of oxytocin given as i.v. bolus or infusion on women undergoing caesarean delivery. Br J Anaesth. 2007;98:116-119.
- Moertl MG, Friedrich S, Krashl J, Wadsack C, Lang U, Schlembach D. Haemodynamic effects of carbetocin and oxytocin given as intravenous bolus on women undergoing caesarean delivery: a randomised trial. B J Obstet and Gynaecol. 2011;118:1349-1356
- Fekih M, Jnifene A, Fathallah K, Ben Regaya L, Memmi A, Bouguizene S. Benefit of misoprostol for prevention of postpartum hemorrhage in caesarean section: a randomized controlled trial [in French]. J Gynecol Obstet Biol Reprod (Paris) 2009; 38(7):588-93
- Zhao Y, Li X, Peng Y. Clinical study on reduction of postpartum bleeding in caesarean section by misoprostol [in Chinese]. Zhonghua Fu Chan Ke Za Zhi 1998;33(7):403-5.
- Dansereau J, Joshi AK, Helewa ME, Doran TA, Lange IR, Luther ER, et al. Double-blind comparison of carbetocin versus oxytocin in prevention of uterine atony after caesarean section. Am J Obstet Gynecol. 1999 Mar;180(3 Pt 1):670-676
- De Bonis M, Torricelli M, Leoni L, Berti P, Ciani V, Puzzitiello R, et al. Carbetocin versus oxytocin after caesarean section: similar efficacy but reduced pain perception in women with high risk of postpartum haemorrhage. The J of Maternal-Fetal and Neonatal Med. 2012;25:732-735.
- John R. Cook, Kunal Saxena, Catharine Taylor, Jeffrey L. Jacobs. Cost-effectiveness and budget impact of heat-stable carbetocin compared to oxytocin and misoprostol for the prevention of postpartum hemorrhage (PPH) in women giving birth in India. BMC Health Services Research 2023;23:267
- Larciprete G, Montagnoli C, Frigo M, Panetta V, Todde C, Zuppani B, et al. Carbetocin versus oxytocin in caesarean section with high risk of post partum hemorrhage. J Prenatal Med. 2013;7(1):12.
- Ali AA, Nasr AAM, Ahmed HH, El- Rasheedy MI, Badawy M. Carbetocin versus Oxytocin and Misoprostol in prevention of atonic post-partum hemorrhage in high risk patients planned for cesarean delivery. Int J Reprod Contracept Obstet Gynecol 2018;7:10-4.
- Elgazayerli W.S. Comparison between syntocinon, misoprostol and carbetocin in reducing blood loss in elective caesarean section. ebwhj. 2019.45492, Vol. 9, No. 3.