

ORIGINAL RESEARCH

Carbetocin versus Oxytocin Effectiveness for the Management of Third Stage of Labour in a Tertiary Care Centre, Coimbatore

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ABSTRACT

Background: World wide around 220 women die due to severe hemorrhage after the childbirth. Postpartum hemorrhage is the most common cause of maternal mortality. Uterine atony is the common cause of Postpartum hemorrhage. Thus in order to prevent this we need to manage actively the third stage of labour. Generally we use oxytocin for the contraction of uterus after delivery. But due to its shorter half life, less contraction time and more side effects. But nowadays it was found that carbetocin has prolonged action time and less side effects. Thus the aim of the study is to compare the effectiveness and safety of the vs oxytocin (Iv infusion) in the management of the third stage of labour

Methods: This prospective cross sectional study was done in the Department of Obstetrics and Gynecology, Government Medical College and ESI hospital, Coimbatore. The study period was from January 2021 to December 2021. Based on the inclusion and exclusion criteria the final sample size obtained was 50. General examination, per abdomen examination, Ultrasound were done. The collected data was entered in the MS excel Windows 10 and the statistical analysis was done in the SPSS 23. p value <0.05 is considered as statistically significant.

Results: The baseline characteristics of the study participants were not similar. Mild anemia was found in majority of the study participants in both the groups. No side effects noticed in Carbetocin group. Nausea, abdominal pain noticed in the Oxytocin group. The average blood loss was found to be more in Oxytocin group compared to Carbetocin group.

Conclusion: In our study carbetocin was found to be more effective than oxytocin as it maintains the uterine tone adequately, prevents the blood loss and prevents the postpartum hemorrhage in women undergoing vaginal delivery. Thus Carbetocin is considered as a good alternative to oxytocin for the active management of the third stage labour.

Keywords: Postpartum hemorrhage, third stage labour, maternal mortality, uterine tone

INTRODUCTION

In this modern world every minute a woman dies due to Postpartum hemorrhage. It causes the major reason for morbidity and 25% of mortality in both maternal and child health.⁽¹⁾ Postpartum hemorrhage tends to occur in 4% of the normal vaginal delivery.⁽²⁾ This percentage tends to increase in developing countries. In low income countries the maternal death due to PPH accounts for 30%.⁽³⁾ Most of the death occurs within 4 hours of delivery which implicates the consequence of the third stage of labour.^(4,5)

Blood loss exceeding 500 ml in a vaginal delivery or 1000 ml in Caesarean section is known as Postpartum Hemorrhage. If it occurs in the first 24 hours it is known as Primary Postpartum

Hemorrhage. If it occurs after 24 hours and within 6 weeks it is known as Secondary Postpartum Hemorrhage.⁽⁶⁾ From 2012 WHO recommends us for the active management of the third stage of labour in order to prevent the Postpartum Hemorrhage. This includes uterotonic Oxytocin administration. In addition to this ACOG recommends sustained uterine massage.⁽⁷⁾

Oxytocin is known as conventional uterotonics which was used for the prevention of postpartum hemorrhage. The characteristics are it has a shorted life time, contraction time was less and side effects do occur. The most common side effects like overload of fluid ,convulsions, pulmornay edema and the arrhythmia. Ergot alkaloids was used later. But due to the requirement of protection from light and for it stability and effectiveness which is lost due to not maintaining proper cold chain. But still oxytocin was the recommended uterotonic for the effective management of the active stage of labour. The drug can be given both in intramuscular and intravenous.

Carbetocin in a synthetic analogue of oxytocin which is long acting. Due to its prolonged action it can increase the contraction time and decrease the adverse effects. The adverse effects includes tremor, abdominal pain, pruritis, nausea and headache. As only few literature exist this study was done to compare the effectiveness of the carbetocin and the oxytocin in the management of third stage of labour.

Aim of the study

To compare the effectiveness and safety of the vs oxytocin (Iv infusion) in the management of the third stage of labour.

MATERIALS AND METHODS

Study Area

Department of Obstetrics and Gynecology, Government Medical College and ESI Hospital, Coimbatore

Duration of Study : One year

Period of Study : 1ST Jan 2021 to 31ST December 2021

Type of Study : Hospital based Cross sectional study

Study Population

Pregnant women > 37 weeks of the gestation admitted in the labour ward of ESI Medical college hospital, coimbatore.

Sample Size

Based on the inclusion and the exclusion criteria the samples were recruited throughout the study period and the final sample size obtained was 50. The study participants were divided into two groups randomly by a computer generated number. All the even numbers were grouped into 1 and all the odd numbers were grouped into group 2.

Group 1: They receive carbetocin 100 microgram /ml

Group 2: They receive oxytocin 10 IU

Inclusion Criteria

- Pregnancy duration more than 37 weeks Pregnant women
- Patient achieving normal vaginal delivery and who underwent elective and emergency cesarean section for medical and obstetric reasons.

Exclusion Criteria

- Bleeding disorders or coagulation defect
- Patients on anticoagulant therapy
- Placenta previa and placenta accrete
- Preeclampsia or HELLP syndrome

- Renal, hypertension and heart diseases(serious),Hepatic diseases
- Epilepsy

After obtaining the permission from the Institute of Ethical Committe, the study was done in the Department of obstetrics and Gynecology, Government Medical College and ESI hospital, Coimbatore After that informed written consent of all the study participants were obtained. All the study participants were evaluated thorough a semi-structured questionnaire which includes demographic details and clinical examination, abdomen examination and laboratory test was performed.

- Study participants details like the pregnant women age, parity, gestational age at the time of delivery, comorbidities
- Anthropometric measurements like Height and Weight are measured.
- General examination were done.
- Per abdomen examination was done to find out the uterine height, fetal lie and presentation

Standard techniques were used for the measurement of the anthropometric parameters.

Height

The study participants were asked to stand in erect posture without foot ware. With the help of the stadiometer the height is measured .It is rounded of to the nearest 0.1 cm.

Weight

With the help of the digital electronic machine the weight of the children were measured. Weighing scale was measured after checking the standardisation. The study participant were asked to stand in the weighing machine without footwear and heavy clothing. The weight is expressed in Kg.

Ultrasound Examination

The ultrasound examination is done to rule out the placenta previa ,for localization of placenta and the retroplacental clots .Fetal wellbeing also checked in the ultrasound examination.

Operational Definition

Postpartum Hemorrhage

The loss of blood estimated to be more than 500 ml from the genital tract within 24 hours of vaginal delivery is known as postpartum hemorrhage.

Statistical analysis

After collecting the data it was entered in MS Excel Windows 10.Statistical analysis was done in SPSS 23.Continuous data were expressed in terms of Mean± Standard deviation and Categorical variables were expressed in terms of numbers (percentages).Chi square test was used for Test of Association for Categorical variables. Anova test or Student t test was used for Test of Association for Continuous variables. P value of <0.005 is considered to be statistically significant.

RESULT

Table 1: Comparison of maternal factors among the two study groups (n = 50)

Mean Age	Carbetocin (n=25)	Oxytocin (n=25)	p value
Age Group	24.6 ± 3.4	24.2 ± 3.1	0.52
Systolic Pressure	114 ± 6.2	110 ± 2.1	0.46
Diastolic Pressure	74 ± 3.2	72 ± 10.2	0.44
Gestational age	38 ± 1.1	38.2 ± 1.6	0.36

*p value <0.05 was considered to be statistically significant

The mean age was similar in both the groups. The systolic blood pressure and Diastolic blood pressure was more in Carbetocin group. The gestational age was similar in both the groups. There is no statistically significant difference between the groups.

Table 2: Comparison of Anemia among the two study groups (n = 50)

Anemia	Carbetocin (n=25)	Oxytocin (n=25)	p value
No Anemia	9	10	0.7
Mild	11	13	
Moderate	4	1	
Severe	1	1	

*p value <0.05 was considered to be statistically significant

Mild anemia was noticed in both the groups. There is no significant difference between the groups.

Table 3: Comparison of side effects among the two study groups (n = 50)

Side effects	Carbetocin (n=25)	Oxytocin (n=25)	P value
Nausea	0	1	0.39
Vomiting	0	2	0.15
Fever	0	0	0.5
Headache	0	2	0.15
Hypotension	0	0	0.5
Abdomen pain	0	2	0.15

*p value <0.05 was considered to be statistically significant

No side effects noticed in Carbetocin group. Nausea, abdominal pain noticed in the Oxytocin group.

Table 4: Outcome of 3rd stage of labour (n = 50)

Variables	Carbetocin (n=50)	Oxytocin (n=50)	p value
Blood transfusion < 600 ml	0	5	0.02*
≥ 600 ml	25	21	
Fundal Massage Yes	1	6	0.04*
No	24	19	
Blood transfusion Yes	0	6	0.001*
No	25	19	
Need for additional uterotonics	1	8	0.001*
Yes	24	17	
No			

*p value <0.05 was considered to be statistically significant

Table 5: average blood loss and Post-partum hemorrhage among the two study groups

PPH	Carbetocin (n=25)	Oxytocin (n=25)	p value
Average Blood Loss			
Blood loss	320 ± 24	445 ± 32	0.01

*p value <0.05 was considered to be statistically significant

The average blood loss was found to be more in Oxytocin group compared to Carbetocin group.

DISCUSSION

The mean age of the study participants was 24.6±3.4 in Carbetocin group and 24.2±3.1 in oxytocin group. Similarly Asraf et al⁽⁸⁾ study the mean age was found to be 23.9±3.2 in carbetocin group and 23.3±3.2 in oxytocin group. Reyez OA⁽⁹⁾ and Gonzalez GM et al also performed a study where the mean age of carbetocin was found to be 26.5 years and oxytocin was found to be 26.7 years.

The mean Systolic blood pressure of the Carbetocin group was found to be 114±6.2 and oxytocin 110±2.1 in our study. Debbie lynuy and Nelindac Atherinep⁽¹⁰⁾ showed that the mean preoperative systolic blood pressure was found to be 117±6.8 in Carabetocin and 118±8.3 mm Hg in Oxytocin group. In Ashraf et al study the mean preoperative systolic blood pressure was found to be 112±5.6 in Carabetocin and 110±1.7 mm Hg in Oxytocin group

The mean Diastolic blood pressure of the Carbetocin group was found to be 72±3.2 and oxytocin 72±10.2 in our study. In Debie Lynuy and Nelindac Atherinep⁽¹⁰⁾ showed that the mean preoperative diastolic blood pressure was found to be 69 ± 7.7 mm Hg in Carabetocin and 73 ±8.5 mm Hg in Oxytocin group. In Ashraf et al (43) study the mean preoperative diastolic blood pressure was found to be 75 ± 4.3 in Carabetocin and 72±11.5 mm Hg in Oxytocin group

The mean Gestational age of the Carbetocin group was found to be 38± 1.1 and oxytocin 38.2±1.6 in our study. Similarly in Ahmed Mohamed Maged et al⁽¹¹⁾ study mean Gestational age of the Carbetocin group was found to be 39.4± 1.3 and oxytocin 39.2±1.4 weeks. There is no significant difference between the group.

In our study No blood transfusion required in the Carbetocin group whereas 6 blood transfusions were given in the Oxytocin group. Manal M E Behery et al⁽¹²⁾ in her study showed that none of the carbetocin group required blood transfusion whereas 15.5% of oxytocin group required blood transfusion. No side effects was noted in Carbetocin group whereas in oxytocin group the most common side effect was found to be Vomiting, Headache and abdominal pain in our study. In Ashraf et al study no major side effects noted in both the groups which is contrast to our results. 1% in the carbetocin group and the 6% in oxytocin group in our study required fundal massage. Agnes P Monteo -Fenix et al⁽¹³⁾ stated that 10% patients in carbetocin group and 83% in oxytocin group required fundal massage. In Ashraf et al study none of the carbetocin group required fundal massage only 8.5% of oxytocin group required it.

In our study Additional uterotonics requirement was found to be more in Oxytocin group 8% compared to carbetocin group 1%. In Manal M E Behery et al none of the patient in carbetocin required additional uterotonics whereas 71.5% of women in oxytocin group required additional uterotonics. The need for uterotonics in carbetocin was decreased to 50% compared to oxytocin group in a study conducted by CAG Holleboom, J Van Eyck et al.⁽¹⁴⁾ In Devvie Lyney et al study the 5.7% of the carbetocin and 34.3% of oxytocin group required additional uterotonics. In ashraf

et al study none of the carbetocin group required uterotonic and 10.6% of the oxytocin group required uterotonic.

The average blood loss in the carbetocin group was 320 ± 24 and that of oxytocin group was 445 ± 32 in our study. In Sergio Rosales Ortiz⁽¹⁵⁾ the mean blood loss was 366 ml in carbetocin group and 400 ml in oxytocin group. In Ahmed et al study the mean blood loss was 337 ml in Carbetocin group and 378 ml in oxytocin group.

The incidence of PPH was found to be more in oxytocin group 6% which is more compared to carbetocin group where the PPH has not occurred in our study. In Contrast in Ahmed Mohamed Maged et al study the PPH was found to be 4% in Carbetocin and 16% in Oxytocin group. In Ashraf et al study none of the carbetocin group developed PPH whereas 8.5% developed PPH in Oxytocin group.

CONCLUSION

Our study concludes that a single dose of 100 microgram IV carbetocins was found to be more effective than oxytocin as it adequately maintain the uterine tone, prevent the blood loss and prevent the postpartum hemorrhage in women undergoing vaginal delivery. Thus Carbetocin is considered as an good alternative to oxytocin for the active management of the third stage labour.

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