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Original Research Article

Effect of carbetocin versus oxytocin in postpartum hemorrhage in vaginal delivery

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ABSTRACT

Background: Postpartum hemorrhage (PPH) is excessive bleeding after childbirth, defined as more than 500 ml after a vaginal birth. It can occur within 24 hours (primary PPH) or up to 12 weeks after delivery (secondary PPH). This study aims to observe the effect of carbetocin versus oxytocin in PPH in vaginal delivery.
Methods: A prospective cohort study was conducted for a period of six months April 2024 to October 2024 for a study population postpartum hemorrhage in vaginal delivery.
Results: A comparative analysis was conducted between the carbetocin and oxytocin groups in terms of age and body mass index (BMI). Both groups consisted of 50 participants each, representing 100% of their respective groups. When examining the history of chronic diseases, such as hypertension and diabetes, 20% of participants in the carbetocin group had a history of hypertension, compared to 16% in the oxytocin group. Similarly, 10% of participants in the carbetocin group had a history of diabetes, while 14% in the oxytocin group reported the same condition. Both comparisons showed no statistically significant differences, with p values of 0.524 and 0.631, respectively.
Conclusions: This study found no statistically significant differences in maternal and obstetric characteristics, pregnancy complications, or labor and delivery outcomes between women treated with carbetocin and those treated with oxytocin.

Keywords: Postpartum haemorrhage, Vaginal delivery, Carbetocin, Oxytocin

INTRODUCTION

Postpartum hemorrhage (PPH) is excessive bleeding after childbirth, defined as more than 500 ml after a vaginal birth. It can occur within 24 hours (primary PPH) or up to 12 weeks after delivery (secondary PPH).[1] Common signs include increased heart rate, low blood pressure, fainting, and in severe cases, unconsciousness or death. The most common cause is uterine atony, where the uterus fails to contract properly. Other causes include retained placenta, uterine tears, and blood clotting disorders. PPH occurs in about 4% of vaginal deliveries and contributing to around 25% of maternal deaths

globally. Risk factors include large fetuses, multiple pregnancies, older maternal age.[2]

The World Health Organization (WHO) recommends active management of the third stage of labor, including administering uterotonic agents like oxytocin, which helps contract the uterus and reduce bleeding.[3] Oxytocin is typically given via injection and is effective for both prevention and treatment of PPH. However, it requires proper storage, as it is sensitive to heat. Carbetocin, a longer-acting oxytocin analogue, offers similar benefits with a single dose and fewer side effects. It binds to oxytocin receptors in the uterus, stimulating contractions and thickening the blood.[4] While carbetocin is effective in preventing PPH, it should not be used to induce labor due to potential risks to the mother and baby. More research is needed on its cardiovascular effects.[5]

Carbetocin has the potential to contribute to the reduction of maternal mortality from PPH due to its long-lasting uterotonic effects. However, WHO does not currently recommend carbetocin for PPH prevention, particularly following vaginal deliveries, because of limited evidence supporting its efficacy in these cases.[6]

The use of uterotonic drugs is a cornerstone in preventing PPH, as they significantly reduce its incidence. Oxytocin, administered as 10 IU intramuscularly, is the preferred choice for PPH prevention in low-risk vaginal. It is typically given after the delivery of the anterior shoulder to aid in uterine contraction. This study aims to observe the effect of carbetocin versus oxytocin in PPH in vaginal delivery.[7]

METHODS

A prospective cohort study was conducted at the Obstetrics and Gynecology ward in Sri Ramachandra Medical College and Research Institute (SRMC and RI), Porur, Chennai, Tamilnadu for the period of May 2024 – October 2024. The study protocol was approved by the institutional Ethics Committee of Sri Ramachandra Institute of Higher education and Research, deemed to be University, Chennai, Tamil Nadu, India (CSP/24/APR/146/139). After getting written informed consent or and assent from the patients and caretakers. The study population includes women who expected to give birth vaginally and gestational age between 37 and 40 weeks. Women with risk factors for developing atonic PPH like previous PPH, primipara >40 years, grand multipara (>5 previous vaginal deliveries), BMI >35, multiple pregnancy, and prolonged labour. The study population excluded are gestational age less than 37 weeks or more than 40 weeks. Women with no risk factors for developing atonic PPH. Women too distressed to provide informed consent. Women had known allergies to carbetocin, oxytocin homologues or methylergometrine. Women had a serious cardiovascular disorder, serious hepatic or renal disease, epilepsy or coagulopathy. Causes of antepartum haemorrhage such as: placenta previa, abruptio placenta. The sample size was determined by using epi software 2.1.3 version with confidence interval 95%. The calculated sample size was 46 for each group. Hence with 10% of attrition rate. The sample size was found to be 50. The collected data were analyzed with IBM. Statistical package for the social sciences (SPSS) statistic software version 60. To describe about the data, descriptive statistics mean and standard deviation (SD) were used. To find the significant difference between two groups Chi-square test was used. In the above statistical tool, the probability value 0.05 is considered as significant level.

RESULTS

Based on Table 1, a comparative analysis was conducted between the carbetocin and oxytocin groups in terms of age and BMI. Both groups consisted of 50 participants each, representing 100% of their respective groups. The mean age of participants in the carbetocin group was 29.8 years (SD±4.5), while in the oxytocin group, it was 29.9 years (SD±4.6). The difference in mean age between the two groups was not statistically significant, with a p value of 0.913. The Chi-square test indicated a p value of 0.767, suggesting no significant difference in BMI distribution between the carbetocin and oxytocin groups.

Table 1: Age and BMI.

Variable	Carbetocin (n=50 [100%])	Oxytocin (n=50 [100%])	P value
Age in years			
Mean±SD	29.8±4.5	29.9±4.6	0.913
<25	10 (20)	10 (20)	0.999
25-30	15 (30)	14 (28)	
30-35	12 (24)	13 (26)	
35-40	8 (16)	8 (16)	
≥40	5 (10)	5 (10)	
Body mass index in kg/m			
<25	15 (30)	16 (32)	0.767
25 to <30	20 (40)	18 (36)	
≥30	15 (30)	16 (32)	

Table 2 compares the maternal and obstetric characteristics between the carbetocin and oxytocin groups, each consisting of 50 participants. Regarding smoking during pregnancy, 14% of participants in the carbetocin group reported smoking, compared to 16% in the oxytocin group. This difference was not statistically significant, with a p value of 0.725.

In terms of multiple pregnancies, 86% of participants in the carbetocin group had multiple pregnancies, compared to 84% in the oxytocin group. The comparison between these two groups showed no significant difference, as indicated by a p value of 0.783.

When examining the history of chronic diseases, such as hypertension and diabetes, 20% of participants in the

carbetocin group had a history of hypertension, compared to 16% in the oxytocin group. Similarly, 10% of participants in the carbetocin group had a history of diabetes, while 14% in the oxytocin group reported the same condition. Both comparisons showed no statistically significant differences, with p values of 0.524 and 0.631, respectively.

Overall, the analysis of maternal and obstetric characteristics, including smoking during pregnancy, multiple pregnancies, and previous chronic diseases (hypertension and diabetes), revealed no statistically significant differences between the carbetocin and oxytocin groups. These findings suggest that both groups were comparable in these baseline characteristics, ensuring a balanced comparison for further analysis.

Table 2: Maternal and obstetric characteristics in two groups.

Variable	Carbetocin (n=50 [100%])	Oxytocin (n=50 [100%])	P value
Smoking during pregnancy	7 (14)	8 (6)	0.725
Multiple pregnancy	43 (86)	42 (84)	0.783
Previous chronic disease			
HTN	10 (20)	8 (16)	0.524
Diabetes	5 (10)	7 (14)	0.631

Data was analyzed by using descriptive statistics and Chi-square test; *p value <0.005 is considered as statistically significant; HTN – hypertension, SD – standard deviation

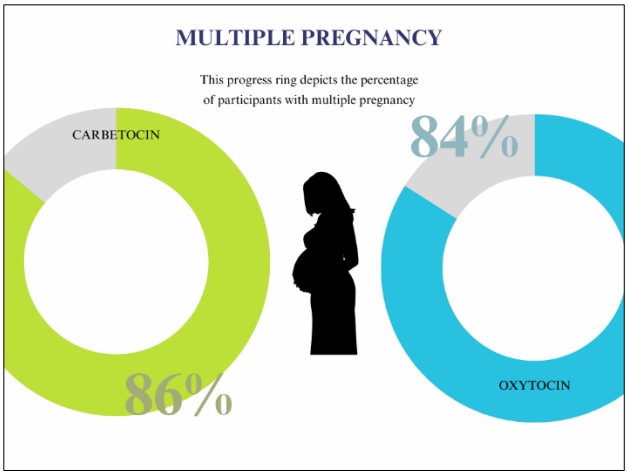

Figure 1: Complications of pregnancy in study participants.

Table 3 compares various pregnancy complications between the carbetocin and oxytocin groups, each comprising 50 participants. The incidence of preterm labor was 16% in the carbetocin group and 20% in the oxytocin group, while gestational diabetes was observed in 12% of the carbetocin group and 16% of the oxytocin group. Hypertensive diseases affected 14% of participants in the carbetocin group and 18% in the oxytocin group. Other complications, such as aspirin use, preterm rupture of membranes, bleeding, placenta previa, hydramnios, and gestational anaemia, were reported at similar rates in both groups, with p-values ranging from 0.568 to 0.799, indicating no statistically significant differences.

Overall, the comparison of pregnancy complications between the two groups revealed no statistically significant differences across all assessed variables. This suggests that both the carbetocin and oxytocin groups experienced comparable rates of pregnancy-related complications, highlighting similar baseline characteristics for these conditions.

Table 3: Complications during pregnancy in two groups.

Complications during pregnancy	Carbetocin (n=50 [100%])	Oxytocin (n=50 [100%])	P value
Preterm labor	8 (16)	10 (20)	0.589
GD	6 (12)	8 (16)	0.620
HTN diseases	7 (14)	9 (18)	0.568
Aspirin	5 (10)	6 (12)	0.746
Preterm rupture of membranes	4 (8)	5 (10)	0.742
Bleeding	6 (12)	7 (14)	0.799
Placenta previa	3 (6)	4 (8)	0.743
Hydramnios	2 (4)	3 (6)	0.727
Gestational anemia <11 g/dl	7 (14)	6 (12)	0.721

Data was analyzed by using descriptive statistics and Chi-square test; *p value <0.005 is considered as statistically significant; HTN – hypertension

Table 4 compares labor and delivery characteristics between the carbetocin and oxytocin groups, each consisting of 50 participants. Spontaneous labor occurred in 90% of the carbetocin group and 84% of the oxytocin group, with no statistically significant difference (p value of 0.587). The mean gestational age at delivery was similar between the groups, with 38.2 weeks in the carbetocin group and 38.1 weeks in the oxytocin group (p value of 0.862). When categorized, 16% of carbetocin group participants and 20% of oxytocin group participants delivered before 37 weeks (p value of 0.681). Most deliveries occurred between 37 and 40 weeks (64% in carbetocin and 60% in oxytocin), and 20% of both groups delivered at or beyond 40 weeks, with no significant differences observed.

The mean duration of labor was 10.5 hours in the carbetocin group and 10.7 hours in the oxytocin group, with a p value of 0.812, indicating no significant difference. Similarly, the incidence of fever during labor was 12% in the carbetocin group and 14% in the oxytocin group, with a p value of 0.783, showing no statistically

significant difference. Overall, the labor and delivery characteristics, including the occurrence of spontaneous labor, gestational age at delivery, labor duration, and fever, were comparable between the carbetocin and oxytocin groups, indicating similar labor and delivery profiles in both groups.

Table 4: Labour and delivery characteristics in two groups.

Variable	Carbetocin (n=50 [100%])	Oxytocin (n=50 [100%])	P value
Spontaneous labor	45 (90)	42 (84)	0.587
Gestational age at delivery in weeks			
Mean±SD	38.2±1.5	38.1±1.4	0.862
<37	8 (16)	10 (20)	0.681
37–40	32 (64)	30 (60)	0.642
≥40	10 (20)	10 (20)	1.000
Labor duration in hours (mean±SD)	10.5±2.3	10.7±2.5	0.812
Fever during labor	6 (12)	7 (14)	0.783

Data was analyzed by using descriptive statistics, Chi-square test and Independent T-test; *p value <0.005 is considered as statistically significant; SD – standard deviation

In both the tables descriptive stats were used to interpret the frequency and percentage, Chi-square test was used to find the difference between the groups and t-test for independent samples while taking into account the pooled variance, which reflects both the means and the SD.

DISCUSSION

This study aimed to compare the maternal and obstetric characteristics, pregnancy complications, and labor and delivery outcomes between two groups treated with carbetocin and oxytocin. Both drugs are commonly used for the prevention of PPH due to their uterotonic properties, which help to contract the uterus and reduce blood loss during childbirth. The study was conducted with 100 participants, divided equally between the carbetocin and oxytocin groups, and the analysis focused on various factors such as age, BMI, maternal complications, and labor outcomes. The findings of this study reveal no statistically significant differences between the two groups across multiple parameters, indicating that both carbetocin and oxytocin have comparable efficacy and safety profiles in managing labor and delivery.[8]

Maternal and obstetric characteristics

The maternal and obstetric characteristics assessed included age, BMI, smoking during pregnancy, the occurrence of multiple pregnancies, and the presence of chronic diseases such as hypertension and diabetes. The results showed no significant differences between the carbetocin and oxytocin groups in these baseline characteristics.[9,10] The mean age of participants was approximately 29 years in both groups, and the BMI distribution was also similar, with most participants falling within the 25-30 kg/m² range. Smoking rates, incidence of multiple pregnancies, and the presence of chronic diseases like hypertension and diabetes were comparable between the groups (p values: 0.725 for smoking, 0.783 for multiple pregnancies, 0.524 for hypertension, and 0.631 for diabetes).[11]

These findings are consistent with previous studies that have demonstrated the demographic and clinical comparability of patient groups receiving carbetocin and oxytocin for labor induction or augmentation. For example, Su et al found no significant differences in baseline characteristics between carbetocin and oxytocin groups in their study on PPH prevention, suggesting that both drugs can be used interchangeably without significant bias in patient selection based on demographic or obstetric factors. Such consistency in baseline characteristics is essential for minimizing confounding factors and ensuring the reliability of clinical outcomes.[11,12]

Pregnancy complications

The study evaluated common pregnancy complications, including preterm labor, gestational diabetes (GD), hypertensive diseases, aspirin use, preterm rupture of membranes (PROM), bleeding, placenta previa, hydramnios, and gestational anemia. The results showed no statistically significant differences between the carbetocin and oxytocin groups in terms of the incidence of these complications. For instance, preterm labor occurred in 16% of the carbetocin group and 20% of the oxytocin group (p value of 0.589), while the occurrence of hypertensive diseases was reported in 14% of the carbetocin group and 18% of the oxytocin group (p value of 0.568).[12]

These findings align with the results of other studies investigating the safety and efficacy of carbetocin and oxytocin. In a randomized controlled trial by Attilio's et al, both carbetocin and oxytocin showed similar rates of maternal complications, indicating that the choice of uterotonic agent did not significantly influence the risk of conditions such as preterm labor, hypertensive disorders, or GD. Furthermore, the study by Boucher et al also reported no significant differences in maternal complications between carbetocin and oxytocin groups, supporting the idea that both drugs have similar safety profiles concerning pregnancy-related complications.[13,14]

Labor and delivery characteristics

Labor and delivery characteristics, such as the occurrence of spontaneous labor, gestational age at delivery, labor duration, and the presence of fever during labor, were

assessed to determine the impact of carbetocin and oxytocin on the labor process. The results indicated no statistically significant differences between the two groups. Spontaneous labor occurred in 90% of the carbetocin group and 84% of the oxytocin group (p value of 0.587). The mean gestational age at delivery was approximately 38 weeks for both groups, and the duration of labor was around 10.5 to 10.7 hours, with p-values indicating no significant differences (p value for gestational age=0.862, p value for labor duration=0.812). Fever during labor was reported in 12% of the carbetocin group and 14% of the oxytocin group, with a p value of 0.783.[15,16]

The lack of significant differences in these labor and delivery outcomes suggests that carbetocin and oxytocin are equally effective in managing labor and do not differ substantially in their effects on the duration of labor, the timing of delivery, or the risk of fever during labor. These findings are supported by studies such as the one conducted by Leung et al, which compared carbetocin and oxytocin for labor induction and found no significant differences in labor outcomes between the two drugs. Similarly, the research by Maged et al also reported comparable efficacy of carbetocin and oxytocin in terms of labor duration and delivery timing, further validating the results of this study.[17,18]

Implications for clinical practice

The findings of this study have important implications for clinical practice. The lack of significant differences in maternal and obstetric characteristics, pregnancy complications, and labor and delivery outcomes between carbetocin and oxytocin groups suggests that both drugs can be used interchangeably for the prevention of PPH without compromising patient safety or clinical efficacy. This is particularly relevant in settings where oxytocin is traditionally used but where carbetocin might offer advantages due to its longer duration of action and reduced need for repeated dosing.[19]

The similar safety profiles of carbetocin and oxytocin also suggest that carbetocin could be a valuable alternative in scenarios where oxytocin may not be readily available or where a single-dose administration is preferred. This can help reduce the burden on healthcare resources and improve the management of PPH, especially in low-resource settings where healthcare providers may face challenges in administering multiple doses of oxytocin. Studies like those by Boucher et al and Attilakos et al have highlighted the practical benefits of using carbetocin, such as fewer nursing interventions and decreased need for additional uterotonic agents.[20,21]

Limitations and future research directions

Despite the valuable insights provided by this study, there are some limitations that need to be acknowledged. First, the sample size was relatively small, with only 100 participants, which may limit the generalizability of the findings. Larger studies with more diverse populations are needed to confirm these results and to explore any potential differences that might emerge in different demographic or clinical contexts. Additionally, this study did not evaluate the long-term outcomes of carbetocin and oxytocin use, such as maternal and neonatal health beyond the immediate postpartum period. Future research should focus on the long-term safety and efficacy of these drugs, as well as their impact on breastfeeding success, maternal satisfaction, and neonatal outcomes.

Moreover, while this study did not find significant differences in complications during pregnancy, labor, and delivery, it would be valuable to investigate other potential side effects or benefits of carbetocin and oxytocin. For example, the impact of these drugs on postpartum recovery, patient comfort, and overall satisfaction with the childbirth experience could provide additional insights into their use in clinical practice. Further studies could also explore the cost-effectiveness of carbetocin compared to oxytocin, considering factors such as reduced need for additional medications, lower healthcare resource utilization, and potential improvements in patient outcomes.

CONCLUSION

In conclusion, this study found no statistically significant differences in maternal and obstetric characteristics, pregnancy complications, or labor and delivery outcomes between women treated with carbetocin and those treated with oxytocin. These findings suggest that both drugs are equally effective and safe for managing labor and preventing postpartum hemorrhage. The similarity in safety profiles and clinical efficacy supports the use of carbetocin as an alternative to oxytocin, particularly in settings where a single-dose administration is advantageous. Future research should focus on larger, more diverse populations and investigate long-term outcomes and cost-effectiveness to further validate the findings of this study and to optimize the management of labor and delivery in clinical practice.

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REFERENCES

1. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, et al. Global causes of maternal death: a

WHO systematic analysis. Lancet Glob Health. 2014;2(6):e323-33.
2. Hogan MC, Foreman KJ, Naghavi M, Ahn SY, Wang M, Makela SM, et al. Maternal mortality for 181 countries, 1980-2008: a systematic analysis of progress towards Millennium Development Goal 5. Lancet. 2010;375(9726):1609-23.
3. World Health Organization. Trends in maternal mortality: 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. 2019. Available at: https://www.who.int/publications/i/item/9789240068759. Accessed on 12 January 2026.
4. National Health Portal of India. Postpartum haemorrhage. Available at: https://www.nhp.gov.in/disease/gynaecology-and obstetrics/postpartum haemorrhage. Accessed on 12 January 2026.
5. Sentilhes L, Vayssière C, Deneux-Tharaux C, Aya AG, Bayoumeu F, Bonnet MP, et al. Postpartum hemorrhage: guidelines for clinical practice from the French College of Gynaecologists and Obstetricians (CNGOF): in collaboration with the French Society of Anesthesiology and Intensive Care (SFAR). Eur J Obstet Gynecol Reprod Biol. 2016;198:12-21.
6. Heneghan C, Ward A, Perera R; Self-Monitoring Trialist Collaboration; Bankhead C, Fuller A, et al. Self-monitoring of oral anticoagulation: systematic review and meta-analysis of individual patient data. Lancet. 2012;379(9813):322-34.
7. Westhoff G, Cotter AM, Tolosa JE. Prophylactic oxytocin for the third stage of labour to prevent postpartum haemorrhage. Cochrane Database Syst Rev. 2013;(10):CD001808.
8. Torloni MR, Gomes Freitas C, Kartoglu UH, Gülmezoglu AM, Widmer M. Quality of oxytocin available in low- and middle-income countries: a systematic review of the literature. BJOG. 2016;123(13):2076-86.
9. Malm M, Madsen I, Kjellström J. Development and stability of a heat-stable formulation of carbetocin for the prevention of postpartum haemorrhage for use in low and middle-income countries. J Pept Sci. 2018;24(6):e3082.
10. Su LL, Chong YS, Samuel M. Carbetocin for preventing postpartum haemorrhage. Cochrane Database Syst Rev. 2012;(2):CD005457.
11. Leduc D, Senikas V, Lalonde AB. Active management of the third stage of labour: prevention and treatment of postpartum hemorrhage. J Obstet Gynaecol Can. 2018;40(12):e841-55.
12. Delorme P, Kayem G, Legardeur H, Roux-Dessarps LA, Girard G, Meunier G, et al. Carbetocin versus oxytocin for the prevention of postpartum hemorrhage in cesarean deliveries: a retrospective study of two consecutive periods. AJP Rep. 2020;10(3):e241-6.
13. Mavrides E, Allard S, Chandraharan E, Collins P, Green L, Hunt BJ, et al. Prevention and management of postpartum haemorrhage. BJOG. 2017;124:e106-49.
14. Leduc D, Senikas V, Lalonde AB. Active management of the third stage of labour: prevention and treatment of postpartum hemorrhage. J Obstet Gynaecol Can. 2009;31(10):980-93.
15. Voon HY, Suharjono HN, Shafie AA, Bujang MA. Carbetocin versus oxytocin for the prevention of postpartum hemorrhage: a meta-analysis of randomized controlled trials in cesarean deliveries. Taiwan J Obstet Gynecol. 2018;57(3):332-9.
16. Amornpetchakul P, Lertbunnaphong T, Boriboonhiransarn D, Leetheeragul J, Sirisomboon R, Jiraprasertwong R. Intravenous carbetocin versus intravenous oxytocin for preventing atonic postpartum hemorrhage after normal vaginal delivery in high-risk singleton pregnancies: a triple-blind randomized controlled trial. Arch Gynecol Obstet. 2018;298(2):319-27.
17. Widmer M, Piaggio G, Nguyen TMH, Osoti A, Owa OO, Misra S, et al. Heat-stable carbetocin versus oxytocin to prevent hemorrhage after vaginal birth. N Engl J Med. 2018;379(8):743-52.
18. Maged AM, Hassan AM, Shehata NA. Carbetocin versus oxytocin for prevention of postpartum hemorrhage after vaginal delivery in high risk women. J Matern Fetal Neonatal Med. 2016;29(4):532-6.
19. Sheldon WR, Blum J, Vogel JP, Souza JP, Gülmezoglu AM, Winikoff B, et al. Postpartum haemorrhage management, risks, and maternal outcomes: findings from the World Health Organization multicountry survey on maternal and newborn health. BJOG. 2014;121:5-13.
20. Dyer RA, Butwick AJ, Carvalho B. Oxytocin for labour and caesarean delivery: implications for the anaesthesiologist. Curr Opin Anaesthesiol. 2011;24(3):255-61.
21. Schramme AR, Pinto CR, Davis J, Whisnant CS, Whitacre MD. Pharmacokinetics of carbetocin, a long-acting oxytocin analogue, following intravenous administration in horses. Equine Vet J. 2008;40(7):658-61.

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