

Comparison of Carbetocin and Oxytocin in the Prevention of Post-Partum Hemorrhage Following Normal Vaginal and Cesarean Delivery

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Abstract: ***Aim:** To compare the efficacy of carbetocin and oxytocin for the prevention of postpartum hemorrhage (PPH) in women undergoing normal vaginal and cesarean delivery. **Materials and Methods:** This prospective comparative study was conducted in an urban tertiary care setting with 200 women, equally divided into normal vaginal delivery and cesarean delivery groups. Each group was further subdivided to receive either carbetocin 100 mcg IM/IV or oxytocin 10 IU IV infusion plus 10 IU IM post-delivery. Hemoglobin and hematocrit levels were measured pre-delivery and 24 hours post-delivery. The need for additional uterotonics was recorded. **Results:** Demographic variables such as age and parity showed no significant differences between the groups. Use of additional uterotonics was significantly lower in the carbetocin group for both delivery modes. No significant differences were noted in post-delivery hemoglobin and hematocrit levels between the two drugs. **Conclusion:** Carbetocin was associated with reduced need for additional uterotonics compared to oxytocin in both vaginal and cesarean deliveries, making it a suitable alternative for PPH prophylaxis.*

Keywords: postpartum hemorrhage prevention, carbetocin, oxytocin, vaginal delivery, cesarean delivery

1. Introduction

Postpartum hemorrhage (PPH) remains the leading cause of maternal mortality worldwide, accounting for approximately 25% of maternal deaths. Uterine atony is the most common cause, and prophylactic administration of uterotonic agents during the third stage of labor significantly reduces PPH incidence. Oxytocin is the standard first-line drug but has a short half-life and requires cold-chain storage. Carbetocin, a long-acting synthetic oxytocin analogue, has greater heat stability and prolonged action, potentially offering advantages in resource-limited settings. This study aims to compare the efficacy of carbetocin and oxytocin in preventing PPH after both vaginal and cesarean deliveries.

2. Materials and Methods

A total of 200 women with term singleton pregnancies (37–40 weeks) were enrolled from JJM Medical College's affiliated hospitals between August 2023 and January 2025. They were randomly allocated to two groups: Group A (vaginal delivery) and Group B (cesarean delivery). Each group had 50 women receiving carbetocin (100 mcg IM/IV) and 50 receiving oxytocin (10 IU IV infusion + 10 IU IM). Pre-delivery hemoglobin and hematocrit were recorded. Post-delivery measurements at 24 hours were used to estimate blood loss. The need for additional uterotonics (misoprostol or methylergometrine) was documented.

3. Results

Baseline demographics (age, parity) showed no significant differences between the carbetocin and oxytocin groups. Postpartum hemoglobin and hematocrit levels decreased in both groups, but differences were not statistically significant. However, the use of additional uterotonics was

significantly lower in the carbetocin group for both vaginal and cesarean deliveries.

Table 1: Use of Additional Uterotonics

Delivery Mode	Carbetocin Group	Oxytocin Group
Vaginal Delivery	4%	22%
Cesarean Delivery	6%	28%

4. Discussion

This study found that while both carbetocin and oxytocin effectively maintained postpartum hemoglobin and hematocrit, carbetocin significantly reduced the requirement for additional uterotonics. This aligns with previous studies suggesting carbetocin's prolonged uterotonic effect reduces secondary drug use. Its heat stability and single-dose administration make it especially suitable for low-resource settings. Limitations include the single-center design and lack of long-term follow-up on maternal outcomes.

5. Conclusion

Carbetocin is as effective as oxytocin in preventing postpartum hemorrhage following vaginal and cesarean deliveries, with the added benefit of reducing the need for additional uterotonics. Its stability and ease of administration make it an attractive alternative for PPH prophylaxis, particularly in resource-limited settings.

References

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