

Carbetocin Compared to Oxytocin in the Active Management of Third Stage of Labour in Aminu Kano Teaching Hospital: A Double-blind, Randomized Controlled Trial

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Introduction & Aim

Postpartum haemorrhage (PPH) is the leading cause of maternal morbidity and mortality in low-and-middle-income countries (LMIC)¹. Oxytocin, the recommended first-line drug, is heat-labile and requires a cold chain for transport and storage, which may not be practical in LMIC^{2,3}. This study aimed to **compare the effectiveness** of the heat-stable **Carbetocin to Oxytocin in preventing PPH** in the active management of the third stage of labour in LMIC.

Methods

Recruitment was among consenting pregnant women attending the largest tertiary health facility in Kano State, Nigeria. Participants were recruited in the early active phase of labour and randomized into Carbetocin and Oxytocin groups. The **intervention (Carbetocin), or control (Oxytocin)**, was administered as part of the active management of the third stage. Both participants and researchers were blinded to group status. Brass-V drape was used to collect blood lost in the third stage and for 1 hour and was weighed immediately. The primary outcome measure was the proportion of women with PPH. Other outcomes included mean blood loss, use of additional uterotonics, side effects, and cost-effectiveness analysis, among others. Data was analysed using STATA statistical software version 16.1. Descriptive statistics described the characteristics of women across the two groups and tests of significance compared variables. Multiple regressions adjusted for potential confounders. Cost-effectiveness analysis was conducted using the incremental cost-effectiveness ratio (ICER). The number needed to treat (NNT) was assessed for clinical significance.

Results

214 participants were recruited. Seven participants were excluded from the final analysis as they ended up with Caesarean section. The mean age of the participants was 27.6 years $\pm$ 4.8 SD and mean gestational age at booking was 21.1 weeks $\pm$ 7.3 SD. 18.8% of the participants were nullipara, 64.3% had above secondary school education and 68.1% were unemployed. PPH incidence in both treatment groups is described in **Table 1** below.

Table 1. Incidence of Postpartum Hemorrhage (PPH) among Participants in Carbetocin and Oxytocin Groups.

	Total (n=207)	Carbetocin (n=103)	Oxytocin (n=104)	*P-value
PPH Incidence				
Yes [n (%)]	26 (12.6%)	5 (4.8%)	21 (20.2%)	0.001
No [n (%)]	181 (87.4%)	98 (95.2%)	83 (79.8%)	
Adjusted Odds Ratio (95% CI)		0.23 (0.08 - 0.67)	1.00	

***NNT for the above was 6.5**

☐ **Additional uterotonics were needed less in the Carbetocin** (9.7%) compared to the Oxytocin group (31.7%) (aOR 0.28, 95% CI 0.12 - 0.67).

☐ **Side effects were reported more by the Oxtocin** group (11.5%) than by the Carbetocin group (7.8%) (p=0.358).

☐ Mean postpartum blood loss is compared between the two groups in **Figure 1**:

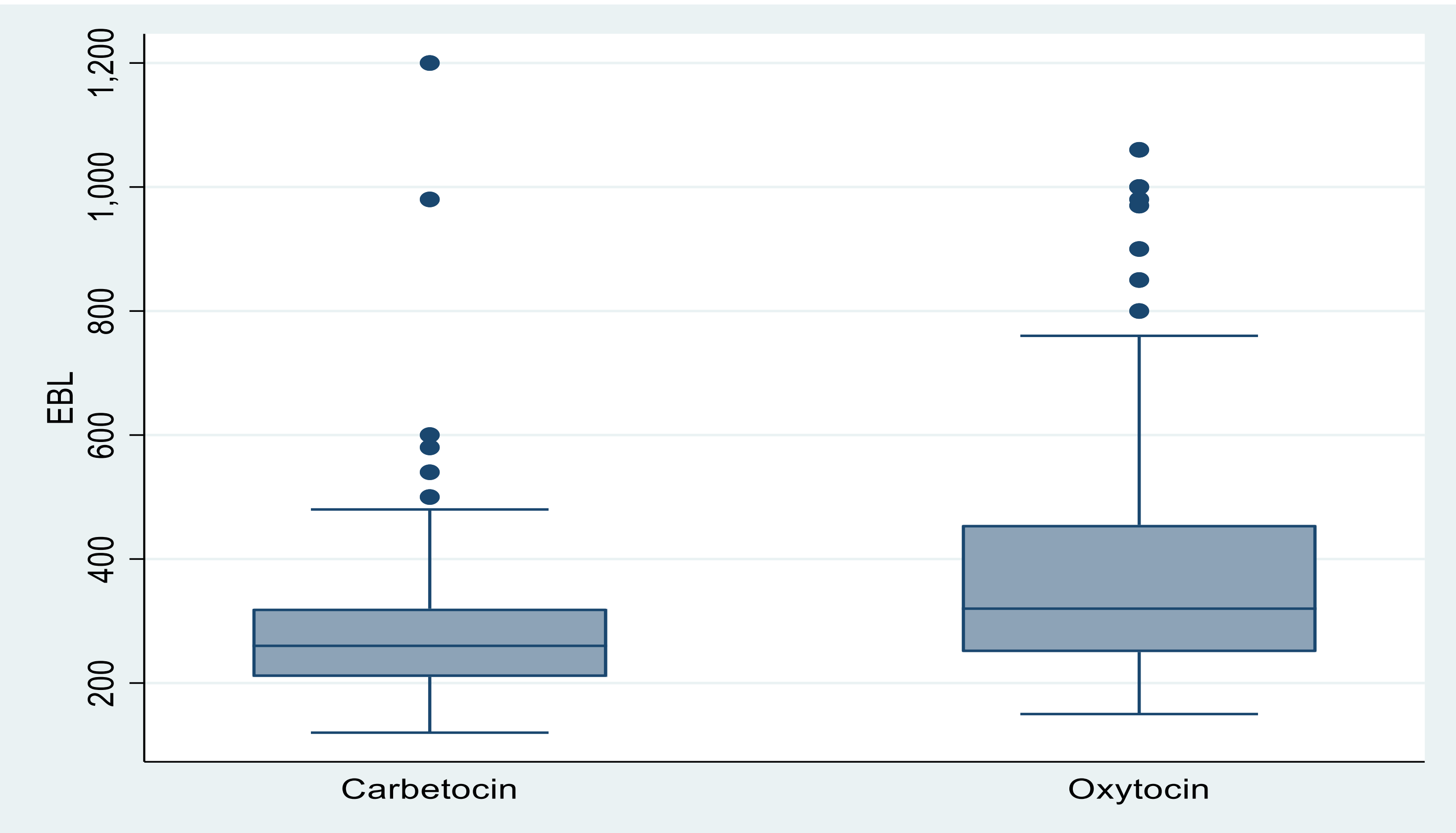


Figure 1. Box Plot showing Lower Mean Blood Loss at Delivery in Carbetocin Group Compared to Oxytocin Group [291.8 $\pm$ 147.2 vs 395.1 $\pm$ 208.1 (p = 0.0001)]

☐ The calculated **ICER was ₦15,293**, the amount saved per avoided haemorrhagic event using Carbetocin (**Table 2**).

Table 2. Cost-effectiveness Analysis.

	PPH Incidence	Avoided Events (Δ E)	Mean Cost (total cost/no. of participants)	Δ Cost (Δ C)	ICER (Δ Cost (₦)/Avoided PPH)
Carbetocin	0.0485	0.1534	₦ 1,400	₦ 2,346	₦ 15,293
Oxytocin	0.2019		₦ 3,746		

Conclusions

☐ **Our study concluded that using Carbetocin in the active management of third stage of labour was more effective than Oxytocin in reducing the incidence of PPH and total blood loss in our setting. It was also more cost-effective. This result was both statistically and clinically significant.**

☐ **We recommend replacing Oxytocin with Carbetocin for this purpose in our setting.**

References

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