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ORIGINAL RESEARCH

A comparative study on prophylactic use of oxytocin and carbetocin in cesarean delivery to prevent primary postpartum hemorrhage in tertiary care centre, Sitapur

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ABSTRACT

Background: Cesarean section(CS) is a common surgical procedure worldwide, essential for saving lives and preventing birth complications. This study aims to compare the prophylactic use of oxytocin and carbetocin in cesarean deliveries to prevent primary PPH. **Materials & Methods:** A prospective, comparative study recruiting 130 pregnant women undergoing cesarean section with 65 in each group who all came under inclusion criteria. Women undergoing cesarean delivery were randomly assigned to receive either oxytocin 10 IU IM or carbetocin 100 ug IV prophylactically. Data on blood loss, the need for additional uterotonics, adverse effects, and overall maternal outcomes were collected and analyzed. **Results:** Patients in the carbetocin and oxytocin groups had mean ages of 29.57±3.64 and 29.98±3.70 years, respectively. The groups' ages were comparable because there was no significant age difference between them. Between the groups, there was no significant ($p=0.98$) difference in socioeconomic status and no significant difference was seen in otherdemographic characters. In the Hemodynamic effects, both drugs have ahypotensive effect but we found greater reduction in systolic and diastolic blood pressure in oxytocin group. The amount of blood loss both intraoperative ($p=0.51$) and postoperative ($p=0.24$) was comparable and there was no significant ($p>0.05$) difference in blood loss between the groups. The oxytocin group (41.5%) required more uterotonics than the carbetocin group (18.5%), indicating that carbetocin may be a more effective single agent prophylactic. **Conclusion:** Carbetocin is more effective than oxytocin in preventing primary PPH in cesarean deliveries. Its use could lead to better maternal outcomes and reduced healthcare costs related to PPH management.

Keywords: Postpartum hemorrhage, Cesarean section, Oxytocin, Carbetocin

INTRODUCTION

An obstetric procedure calledcesarean section (CS) is intended to preventbirth problems and preserve lives.[1] The cesarean section is one of the mostcommon elective procedures performed on women worldwide.[2] Even though cesarean sections are frequently performed, the foetus and pregnant women may experiences evere complications as a result of them.Postpartumhaemorrhage (PPH) is among the most frequent side effects of cesareansection.[3] Particularly in developing countries around the world, PPH is one ofthe main causes of maternal death and morbidity. PPH can be described asmore than 500 millilitres of blood lost, and severe PPH as more than 1000millilitres.[4] The American College of Obstetricians and Gynaecologists (ACOG)defines PPH as cumulative blood loss of over or equal to 1000 millilitresaccompaniedwithsymptoms or indicators of hypovolemiaduringthefirsttwenty-four hours of childbirth.[5]

The current gold standard for reducing postpartumhaemorrhageisoxytocin,apeptidehormones ecretedfromtheposteriorpituitary gland that promotes myometrial contract in the second & third phasesof labour (either with or without ergometrine).[6] However, in order to maintainhemodynamic stability, more oxytocin or other therapies are required due tothefailureofoxytocin-

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basedpostpartumhaemorrhageprophylaxis(asdemonstrated by the needfor an extra uterotonic).When compared to oxytocin, carbetocin was found to decrease the need forextra uterotonics and uterine massage.[7]The aim of this study was to compare theefficacy of oxytocin verses carbetocin during cesarean section for preventionofPost Partumhemorrhage.

MATERIALS & METHODS

The present study comprised of 130 pregnant women of reproductive age group and 37 weeks gestation onwards undergoing cesarean section under spinal anaesthesia. All were informed regarding the study and their written consent was obtained.

Data such as name, age, etc. was recorded. Structured history, general & systemic examination, per abdomen examination and per vaginal examination (if required) was done and Effective Fetal Weight (EFW) clinically and by USG was evaluated and high-risk factors were identified and Nil per oral status was checked for emergency cases and for elective cases patients were kept Nil Per Oral according to ASA guidelines. We randomly recruited women in two group, women in oxytocin (group A) received 10 IU of oxytocin (IM) & (group B) got a 100 ug bolus of Carbetocin I/V right away after the baby was delivered.A thorough physical examination and systemic examination were performed.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Assessment of parameters

Parameters	Variables	Oxytocin	Carbetocin	P value
SES	Lower	11	12	0.05
	Upperlower	21	20	
	LowerMiddle	23	21	
	Uppermiddle	6	7	
	Upper	4	5	
Obstetrics history	Primigravida	28	30	0.31
	Multigravida	37	35	
Preoperative vitals	Systolic Blood Pressure	127.2	127.2	0.94
	Diastolic Blood Pressure	78.8	77.8	0.88
	Heart Rate	74.2	76.1	0.90
Mode of delivery	Elective	35	40	0.26
	Emergency	30	25	
Indication fordelivery	CPD	16	6	0.71
	IUGR	3	7	
	Non progressoflabour	9	16	
	Severeoligohydraminos	8	6	
	Fetal distress	12	18	
	Malpresentation	6	2	
	Multiplegestation	2	5	
	PreviousLSCS	9	5	
Adverse reactions	Nausea	16	15	0.84
	Vomiting	1	1	
	Dizziness	6	5	
	Palpitation	1	1	
	Headache	7	5	

Table I, graph I shows that SES was lower in 11 and 12, upper lower in 21 and20,lower middle in 23 and 21, upper middle in 6 and 7 and upper in 4 and 5 patientsin oxytocin and carbetocingroup respectively. More than one third of patients of both oxytocin (43.1%) and carbetocin (46.2%) had primigravida obstetric history and (56.9%) patients of oxytocin and (53.8%) patients of carbetocin had Multigravida obstetricshistory.There was no significant (p>0.05) difference in preoperative vitals between the groups. About(53.8%)ofoxytocinand(61.5%)ofcarbetocinhade lectivemode of delivery whereas(46.2%) of oxytocin and (38.5%) of carbetocin hademergencymodeofdelivery.Fetal distress had been the most frequent reason for birth inpatients in the carbetocin group (27.7%) and Cephalo Pelvic Disproportion(CPD) was the most common reason for delivery in patients in the oxytocingroup (24.6%). Inthe oxytocin group, foetal distress ranked as the secondmostprevalentindicationofdelivery(18.5%),whileinpatientsinthecarbetocin group, non-progress of labour ranked second (24.6%).Nausea was the most common adverse event among patients ofoxytocingroups(24.6%)and(23.1%)patientsofcarbetocingroups.Headache wasthe second most common among oxytocin groups(10.8%)and(7.7%)ofcarbetocingroups.The difference was non- significant (P> 0.05).

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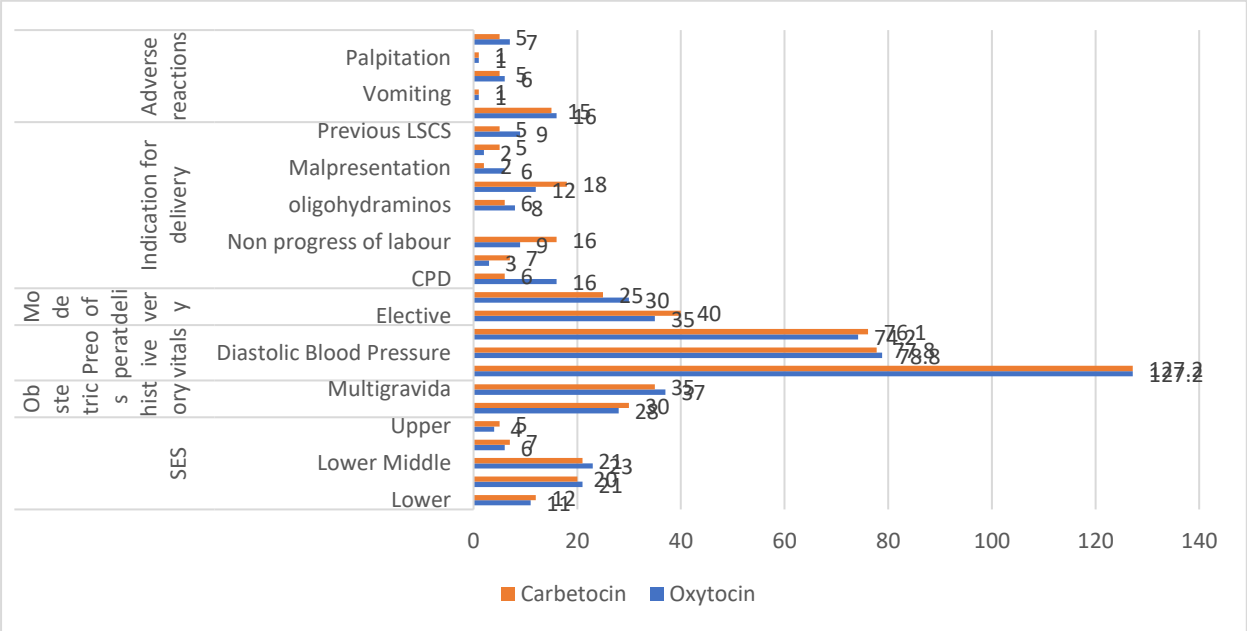
Graph I Assessment of parameters



Neonatal outcome	Oxytocin		Carbetocin		P value
	No.	%	No.	%	
APGARscore					
8-10	62	95.4	64	98.5	0.31
4-7	3	4.6	1	1.5	
NICUadmission					
Yes	18	27.7	12	18.5	0.21
No	47	72.3	53	81.5	

Table II shows that APGAR score 8-10 was among majority of neonates of both oxytocin group (95.4%) and carbetocin group (98.5%). NICU admission was in (27.7%) neonates of oxytocin group and in (18.5%) of carbetocin group. However, there was no significant (p>0.05) difference in neonatal outcome between the groups.

DISCUSSION

The study was conducted in the Department of Obstetrics and Gynaecology, of Hind Institute Of Medical Sciences, Mau, Ataria, Uttar Pradesh with the aim to compare the efficacy of oxytocin verses carbetocin during cesarean section for prevention of Postpartum hemorrhage. A total of 65 patients were included in each group and various parameters were assessed to ensure comparability and evaluate outcomes.

In this study, the mean age of the patients in the oxytocin and carbetocin groups was 29.98±3.70 years and 29.57±3.64 years, respectively.Esmael et al[8] found that compared to oxytocin, carbetocin was shown to be statistically more efficient at preventing uterine atony and, consequently, PPH. Tse et al[9] observed that the two groups (carbetocin vs oxytocin) had comparable blood loss, operating time, rate of postpartum haemorrhage, requirement for additional uterotonics or procedures, need for blood transfusion.

We found that SES was lower in 11 and 12, upper lower in 21and 20, lower middle in 23 and 21, upper middle in 6 and 7 and upper in 4 and 5 patients in oxytocin and carbetocin group respectively. More than one third of patients of both oxytocin (43.1%) and carbetocin (46.2%) had primigravida obstetric history and (56.9%) patients of oxytocin and (53.8%) patients of carbetocin had Multigravida obstetrics history.

About(53.8%)ofoxytocinand(61.5%)ofcarbetocinhade lective mode of delivery whereas(46.2%) of oxytocin and (38.5%) of carbetocin hademergencymodeofdelivery. Fetal distress had been the most frequent reason for birth inpatients in the carbetocin group (27.7%) and Cephalo Pelvic Disproportion(CPD) was the most common reason for delivery in patients in the oxytocingroup (24.6%). Inthe oxytocin group, foetal distress ranked as the secondmostprevalentindicationofdelivery(18.5%),whil einpatientsinthecarbetocin group, non-progress of labour ranked second (24.6%). Nausea was the most common adverse event among patients ofoxytocingroups(24.6%)and (23.1%)patientsofcarbetocingroups.Headache wasthe second most common among oxytocin groups(10.8%)and(7.7%)ofcarbetocingroups.

Ahmedetal[10]reportedfound,althoughstatisticallyinsigni ficant,thecarbetocingrouphadalowerincidenceofsevere

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anaemiaandtherequirementfor blood transfusions than the oxytocin group.

We observed that APGAR score 8-10 was among majority of neonates of both oxytocin group (95.4%) and carbetocin group (98.5%). NICU admission was in (27.7%) neonates of oxytocin group and in (18.5%) of carbetocin group. Kang et al[11] found that there were no significant differences in the postpartum hemoglobin, rate of hemostatics, blood transfusion, additional surgical interventions or uterine massage between the two groups. The rates of mild asphyxia in carbetocin and oxytocin groups were 2.1% and 1.3%, respectively. No other poor maternal and neonatal outcomes were observed in two groups.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that Carbetocin is more effective than oxytocin in preventing primary PPH in cesarean deliveries. Its use could lead to better maternal outcomes and reduced healthcare costs related to PPH management. Further research in diverse settings is recommended to confirm these findings.

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