

DOI: 10.5455/2320-1770.ijrcog20140928

Research Article

Comparison of ramosetron and ondansetron for prevention of nausea and vomiting after carboprost in LSCS patients under spinal anesthesia

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Received: 15 June 2014

Accepted: 1 July 2014

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ABSTRACT

Background: Our aim of the study is to compare the effectiveness of ramosetron and ondansetron to prevent postoperative nausea and vomiting with carboprost in LSCS patients operated under spinal anesthesia.

Methods: 50 patients of age group 20-35 years and ASA physical status of grade I and II scheduled for LSCS with use of carboprost IM under spinal anesthesia. They were randomly allocated into two groups namely group O and group R. inj. ondansetron 4 mg and inj. ramosetron 0.3 mg IV respectively. Patients were observed intraoperatively and in the recovery room and ward for any episodes of nausea and vomiting. Rescue antiemetic was given if the patient had PONV score of 2 and was also recorded. All the patients were observed for side effects such as dizziness, headache, sedation or extrapyramidal reaction and treated accordingly upto 24 hours.

Results: Incidence of nausea in immediate postoperative period was 8 % in group R compared to 20% in group O. Requirement of rescue antiemetic was minimum, i.e., 4% in group R. Incidence of side effects (headache, constipation and dizziness) was comparable in both the groups.

Conclusions: Ramosetron is quite effective to prevent postoperative nausea and vomiting with carboprost in LSCS patients. It also reduces incidence of nausea in immediate postoperative period.

Keywords: Ramosetron, Ondansetron, Spinal anesthesia, LSCS

INTRODUCTION

Post-Operative Nausea and Vomiting (PONV) in Lower Segment Caesarean Section (LSCS) followed by carboprost under spinal anesthesia is very common, although it is self-limiting. However, it can cause significant morbidity including dehydration, electrolyte imbalance, suture tension, wound dehiscence, venous hypertension and bleeding, esophageal rupture and life threatening airway compromise.¹

Incidence of nausea is about 1/3 patient while vomiting is about 2/3 patients in LSCS patients in which carboprost was given IM (intramuscular). Carboprost tromethamine administered intramuscularly stimulates the gravid uterine myometrial contractions similar to labour contractions at the end of a full term

pregnancy. Postpartum, the resultant myometrial contractions provide hemostasis at the site of placentation.²

Carboprost tromethamine also stimulates the smooth muscle of the human gastrointestinal tract. This activity may produce vomiting or diarrhea or both that is common when carboprost tromethamine is used to terminate pregnancy and for use postpartum following normal labour or LSCS.²

Many drugs are used for management of PONV but few of them have side effects like sedation, dysphoria, extrapyramidal symptoms, dryness of mouth, restlessness and tachycardia. 5HT₃ receptors antagonists are devoid of such side effects. Ondansetron, granisetron and newer

drug such as ramosetron and palonosetron are commonly used drugs to prevent PONV.³⁻⁵

In our study, we have compared intravenous ondansetron 4 mg versus ramosetron 0.3 mg as a premedication in LSCS patients with usage of carboprost IM under spinal anesthesia in terms of prevention of nausea and vomiting intraoperative and postoperatively.

METHODS

This prospective, randomized, double blind study was carried out after approval from institutional ethics committee in 50 patients of age group 20-35 years and ASA physical status of grade I and II scheduled for LSCS with use of carboprost IM under spinal anesthesia in Dhiraj general hospital, Vadodara, Gujarat. Patients with history of diabetes mellitus, allergic to local anesthetics, acid peptic disorders, hepatic disorders and taking antiemetic medication were excluded from the study.

After pre-anesthetic evaluation and investigations, the patients were explained about the procedure. Informed written consent was obtained. Standard pre-operative procedure was followed and baseline vital parameters were recorded. They were pre-medicated with inj. ranitidine 1 mg/kg, inj. glycopyrrolate 4 mcg/kg iv half an hour before surgery and randomly allocated into two group; group O and group R. inj. ondansetron 4 mg and inj. Ramosetron 0.3 mg IV respectively. All the patients were pre-loaded with inj. RL 10 ml/kg to prevent intraoperative hypotension followed by nausea and vomiting. Spinal anesthesia will be instituted with 2.2 ml of 0.5% Bupivacaine with 25 gauge spinal needle.

Patients were observed intraoperatively and in the recovery room and ward for any episode of nausea and vomiting or retching which were evaluated on a 3 point PONV score (0 - no nausea or vomiting, 1 - episode of nausea, 2 - retching and vomiting) for next 24 hrs. Rescue antiemetic (inj. metoclopramide 10 mg IV) was given if the patient had PONV score of 2 and was also recorded. All the patients were observed for side effects such as dizziness, headache, sedation or extrapyramidal reaction and treated accordingly upto 24 hours.

Data were analyzed using unpaired "t" test and P value <0.05 was considered statistically significant. Data was presented as mean \pm standard deviation and percentage.

RESULTS

The demographic data with respect to age, sex, height and weight were comparable in both the groups (Table 1). There was no statistically significant difference in respect to duration of surgery and duration of anesthesia in both the groups.

Rescue antiemetic was given when PONV score was 2. Requirement of rescue antiemetic was minimum, i.e., 4%

in group R. Incidence of side effects (headache, constipation and dizziness) was comparable in both the groups (Table 4).

Table 1: Demographic profile.

	Group O	Group R	P value
Age (years)	24.69 \pm 2.72	24.33 \pm 2.58	P >0.05, NS
Height (cm)	157.45 \pm 9.63	154.38 \pm 8.96	P >0.05, NS
Weight (kg)	64.3 \pm 4.7	65.1 \pm 4.9	P >0.05, NS
Duration of Surgery (min)	83.19 \pm 8.76	85.34 \pm 9.12	P >0.05, NS
NS - Non significant			

Table 2: Distribution of patient experiencing nausea in first 24 hours.

Nausea	Group O		Group R	
	No. of patient	%	No. of patient	%
Immediately	5	20	2	8
0-3 hours	2	8	1	4
3-6 hours	1	4	0	0
6-12 hours	0	0	0	0
12-24 hours	1	4	1	4
Total	9	36	4	16

Table 3: PONV score.

PONV score	Group O No. (%)	Group R No. (%)
0 (No nausea & vomiting)	14 (56%)	20 (80%)
1 (Episode of nausea)	8 (32%)	4 (16%)
2 (Episode of retching, vomiting)	3 (12%)	1 (4%)
Total	25 (100%)	25 (100%)

Table 4: Side effects & patient satisfaction.

	Group O	Group R
Complication		
Dizziness	8 (32%)	9 (36%)
Headache	4 (16%)	5 (20%)
Satisfaction		
Satisfied	15 (60%)	20 (80%)
Unsatisfied	10 (40%)	5 (20%)

DISCUSSION

There was no definite study performed regarding comparison of ondansetron and ramosetron after use of carboprost in LSCS. In our setup, we have observed number of patients who had episodes of nausea and vomiting after carboprost i.m. in LSCS. So, our aim was just to compare efficacy of both these antiemetic drugs to prevent nausea and vomiting after carboprost.

Carboprost tromethamine also stimulates the smooth muscle of the human gastrointestinal system. This activity may produce the nausea, vomiting and diarrhea or both that is common when carboprost tromethamine is used to terminate pregnancy and in postpartum period.²

Ramosetron is a recently developed selective 5-HT₃ receptor antagonist. It exhibits significantly greater binding affinity for 5-HT₃ receptors with a slower dissociation rate from receptor binding, resulting in more potent and longer receptor antagonizing effects compared with older 5-HT₃ receptor antagonists.^{6,7}

It was reported that ramosetron is more potent with a longer duration of action than granisetron in the prevention of emesis after cisplatin chemotherapy, and in the prevention of PONV.⁸⁻¹⁰

Choi and colleagues¹¹ reported that ramosetron i.v. was superior to ondansetron i.v. in reducing the severity of nausea, incidence of vomiting, and the use of rescue antiemetics at 6-24 hours after operation in patients who had undergone lumbar spine surgery.

In our study, PONV score was 0 in 56% patients in group O compared to 76% in group R. It suggests that ramosetron is quite effective in controlling nausea and vomiting in both intraoperative and postoperative period.

Fujii et al.^{12,13} mentioned that ramosetron is effective in preventing PONV after major gynecological surgery, and ramosetron 0.3 mg is an effective dose for preventing PONV. In addition, the manufacturer's recommended dose is 0.3 mg i.v. once a day. Therefore, ramosetron at 0.3 mg dose was chosen for this study. Our results demonstrated that ramosetron 0.3 mg was effective in decreasing the incidence of PONV (24% in group R versus 44% in group O). Kim et al.¹⁴ performed similar study in gynecological surgery and they have observed similar results as well.

The most frequently reported adverse events of 5-HT₃ receptor antagonists are dizziness and headache.¹⁵ Adverse events observed in our study were similar in both the groups.

CONCLUSION

We conclude that ramosetron 0.3 mg is quite effective in controlling postoperative nausea and vomiting after use of carboprost in patients of LSCS under spinal anesthesia. It also reduces PONV score and incidence of nausea in first 24 hours post operatively.

ACKNOWLEDGEMENTS

We are thankful to all the staff members and residents of department of anesthesia and Obstetrics and Gynecology for their support. We are also thankful to our patient to be a part of our study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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DOI: 10.5455/2320-1770.ijrcog20140928

Cite this article as: Chauhan D, Bhavsar M.

Comparison of ramosetron and ondansetron for prevention of nausea and vomiting after carboprost in LSCS patients under spinal anesthesia. *Int J Reprod Contracept Obstet Gynecol* 2014;3:581-4.