

# A comparative study of ramosetron versus ondansetron for the prevention of post-operative nausea and vomiting at tertiary health care center

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## Abstract

**Background:** Postoperative nausea (PON) and postoperative vomiting (POV) are common and distressing complications after surgery. **Aims and Objectives:** To study ramosetron versus ondansetron for the prevention of post-operative nausea and vomiting at tertiary health care center. **Methodology:** After approval from institutional ethical committee this cross-sectional study was carried out in the post-operative patients undergoing various surgeries with respect to Nausea, Vomiting, Rescue medicine if required at the tertiary health care center during the one year period i.e. January 2013 to January 2014. There were 50 patients randomly enrolled into the study. These post-operative patients were randomly given ramosetron (Group A) ondansetron (Group B) -25 in the group. The no of patients having post-operative Nausea, Vomiting, Rescue medicine was noted. The statistical analysis done by Chi-square test, unpaired t-test calculated by SPSS -19 version software. **Result:** The mean age (yrs.) in Group A and Group B was  $37 \pm 4.5$  and  $35 \pm 5.1$  (Comparable to each other,  $P > 0.05$ ). The proportions of Males and Females was comparable in each treatment group i.e. 52% and 48% ; 60% and 40% respectively ( $P > 0.05$ ). Post-Operative Nausea and Vomiting in both the treatment group was not statistically significant ( $P > 0.05$ ), but were significantly different at 12-18 Hrs. and highly significant at 12-28 Hrs. i.e. Nausea, Vomiting, Rescue Medicine required -20 %, 12%, 8% and 56%, 40%, 28% ( $P < 0.05$ ); at 18-24 Hrs. 24%, 8%, 4% and 72%, 60%, 44% ( $P < 0.001$ ). **Conclusion:** It can be concluded from our study that Post-Operative Nausea and Vomiting in both the treatment group was comparable with each early post operative period but were significantly different at later post-operative period.

**Key Word:** Ramosetron, ondansetron, Postoperative nausea (PON), postoperative vomiting (POV).

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## INTRODUCTION

Postoperative nausea (PON) and postoperative vomiting (POV) are common and distressing complications after surgery. The guideline<sup>1</sup> for the management of postoperative nausea and vomiting (PONV) recommends the use of prophylactic agents, including 5-HT<sub>3</sub> receptor antagonists, for patients with a high risk of PONV.

Ramosetron is a 5-HT<sub>3</sub> receptor antagonist which displays more prolonged activity than other 5-HT<sub>3</sub> antagonists, such as ondansetron<sup>2</sup>. Previously, we reported results of the metaanalysis of the effects of ramosetron in preventing PON and POV [<sup>3</sup>]; the combined results with 637 patients (six studies) showed that ramosetron had a statistically significant effect on early POV (risk ratio [95% confidence interval] = 0.50 [0.28–0.90]) and late POV (0.53 [0.34–0.81]) but not early PON (0.79 [0.51–1.23]) and late PON (0.78 [0.60–1.46]) compared with 4 mg of ondansetron. Ramosetron was reported to be more effective than ondansetron in preventing POV<sup>3,4</sup>. Ryu *et al.* reported that 8 mg of ondansetron were equally as effective as ramosetron in preventing PONV<sup>5,6</sup>.

## MATERIAL AND METHODS

After approval from institutional ethical committee this cross-sectional study was carried out in the post-operative patients undergoing various surgeries with respect to

Nausea, Vomiting, Rescue medicine if required at the tertiary health care center during the one year period i.e. January 2013 to January 2014. There were 50 patients randomly enrolled into the study. These post-operative patients were randomly given ramosetron (Group A)

ondansetron(Group B) -25 in the group. The no of patients having post-operative Nausea, Vomiting, Rescue medicine was noted. The statistical analysis done by Chi-square test, unpaired t-test calculated by SPSS -19 version software.

## RESULT

**Table 1:** Distribution of the patients as per the age

Group	Mean ±SD	P-value
Group A (n=25)	37 ± 4.5	P>0.05
Group B (n=25)	35 ± 5.1	

The mean age (yrs.) in Group A and Group B was 37 ± 4.5 and 35 ± 5.1 (Comparable to each other, P>0.05).

**Table 2:** Distribution of the patients as per the sex

Sex	Male	Female	Total	P-value
Group A (n=25)	13 (52)	12 (48)	25 (100)	P>0.05
Group B (n=25)	15 (60)	10 (40)	25 (100)	

The proportions of Males and Females was comparable in each treatment group i.e. 52% and 48%; 60% and 40% respectively (P>0.05).

**Table 3:** Distribution of the patients as per the Post-operative Nausea and Vomiting

Timing (Hrs.)	Severity	Group A (n=25)		Group B (n=25)		P-value
		No.	Percentage (%)	No.	Percentage (%)	
0-6	Nausea	0	0	1	4	P>0.05
	Vomiting	1	4	2	4	
	Rescue Medicine	0	0	0	0	
6-12	Nausea	1	4	2	4	P>0.05
	Vomiting	1	4	3	12	
	Rescue Medicine	0	0	2	4	
12-18	Nausea	5	20	14	56	P<0.05
	Vomiting	3	12	10	40	
	Rescue Medicine	2	8	7	28	
18-24	Nausea	6	24	18	72	P<0.001
	Vomiting	2	8	15	60	
	Rescue Medicine	1	4	11	44	

From above table it is clear that the Post-Operative Nausea and Vomiting in both the treatment group was not statistically significant (P>0.05), but were significantly different at 12-18 Hrs. and highly significant at 18-24 Hrs. i.e. Nausea, Vomiting, Rescue Medicine required -20 %, 12%, 8% and 56%, 40%, 28% (P<0.05); at 18-24 Hrs. 24%, 8%, 4% and 72%,60%, 44% (P<0.001).

## DISCUSSION

Despite the remarkable advances in medicine and development of newer anesthetics, PONV continues to be a major cause of morbidity, with an incidence of 30% in the postoperative period.<sup>5</sup> The problem is multifactorial in origin, including patient characteristics, nature of underlying disease, the type of surgery, as well as the anesthetic agents and postoperative care. The main patient-related factors are age, gender, history of motion sickness, previous nausea and vomiting, and pregnancy. The incidence of PONV in females has been reported to be very high and two to three times more prevalent and more severe in adult women than in men.<sup>6</sup> Hormonal factors may lead to a higher incidence of emetic episodes,

with an observed incidence of emesis around four times higher in menstrual age group as compared to the postmenopausal state.<sup>7</sup> Several studies tried to see the comparison between ramosetron and Ondansetran and found that there was no difference between the two groups till 12 h in the postoperative period. However, patients who received ramosetron had a lower incidence of PONV after 12 h.<sup>8,9,10,11</sup> In our study we have found that the mean age (yrs.) in Group A and Group B was 37 ± 4.5 and 35 ± 5.1 (Comparable to each other, P>0.05). The proportions of Males and Females was comparable in each treatment group i.e. 52% and 48% ; 60% and 40% respectively (P>0.05). Post-Operative Nausea and Vomiting in both the treatment group was not statistically

significant ( $P>0.05$ ), but were significantly different at 12-18 Hrs. and highly significant at 12-18 Hrs. i.e. Nausea, Vomiting, Rescue Medicine required -20 %, 12%, 8% and 56%, 40%, 28% ( $P<0.05$ ); at 18-24 Hrs. 24%, 8%, 4% and 72%,60%,44% ( $P<0.001$ ). These findings are similar to Choi *et al.*<sup>12</sup> studied in 94 female nonsmoker patients, who were randomly allocated to receive either ondansetron or the ramosetron after lumbar spine surgery. The authors found that ramosetron was superior to ondansetron in terms of preventing vomiting and reducing the severity of nausea related to fentanyl-based IV patient-controlled analgesia. Also similar to Samiullah Mujoo<sup>13</sup> they found There was no significant difference between the groups in age, gender, weight, duration of anesthesia, and duration of surgery. In the patients, who received ramosetron, it was observed that incidence of the episodes of nausea and vomiting increased with time after surgery. Each patient had an episode of nausea and an episode of vomiting during the 6–12 h interval. Similarly, two patients had episodes of nausea and two patients had episodes of vomiting at 18–24 h. This necessitated the increased need for rescue antiemetics with a total of four patients needing rescue antiemetics at 18–24 h. In patients receiving ondansetron, the episodes of nausea were more in number when compared with the ramosetron group. Twelve patients complained of nausea and thirteen patients had episodes of vomiting with the need for rescue antiemetic in 14 patients. Both genders had a comparable incidence of nausea and vomiting. A single dose of IV ramosetron (0.3 mg) is more effective when compared with a single dose IV ondansetron (6 mg) in the prevention of PONV. We observed that the benefit was more in the later stages of the postoperative period (12–24 h)

## CONCLUSION

It can be concluded from our study that Post-Operative Nausea and Vomiting in both the treatment group was comparable with each early post operative period but were significantly different at later post-operative period.

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