

Comparison of the Efficacy of Ramosetron and Palonosetron in Preventing Postoperative Nausea and Vomiting in Patients undergoing Laparoscopic Surgery

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Received: 14th December, 2021; Revised: 05th February, 2022; Accepted: 25th February, 2022; Available Online: 25th March, 2022

ABSTRACT

Aim: To compare the efficacy of Ramosetron and Palonosetron in preventing postoperative nausea and vomiting (PONV) in patients undergoing laparoscopic surgery.

Method and material: The present study was conducted at the department of anesthesia after taking approval from institutional ethical committee. 70 patients of either gender between the ages of 18 and 60 who have an ASA grade I status 2 were randomly distributed into 2 groups (n=35 each) by block randomization method. Group A patients were administered .075mg palonosetron intravenously (IV) while Group B patients were administered 0.3 mg intravenous Ramosetron (IV). The efficacy of both the drugs was recorded on base of parameters such as nausea, vomiting or usage of rescue medication.

Results: No significant difference was observed in VRS regarding PONV, use of rescue drug or incidence of hypotension.

Conclusion: Our study showed that Palonosetron and Ramosetron were both equally efficacious in controlling PONV in a patient undergoing laparoscopic surgery under general anaesthesia.

Keywords: Laparoscopic surgery, Palonosetron, Ramosetron.

International Journal of Pharmaceutical Quality Assurance (2022); DOI: 10.25258/ijpqa.13.1.9

How to cite this article: Kanase NV, Gandhi SM, Dimble KS. Comparison of the Efficacy of Ramosetron and Palonosetron in Preventing PONV in Patients undergoing Laparoscopic Surgery. International Journal of Pharmaceutical Quality Assurance. 2022;13(1):39-41.

Source of support: Nil.

Conflict of interest: None

INTRODUCTION

Postoperative nausea and vomiting (PONV) is one of the most uncomfortable symptoms that can occur following general anaesthetic surgery. It is reported that it occurs in around 25% adults undergoing surgery under GA.¹ High incidence of PONV (40–70%) is reported in patients undergoing laparoscopic procedures. PONV after laparoscopic surgery has a complex etiology that is influenced by a number of factors such as age, obesity, previous PONV, surgical approach, anesthetic technique, and postoperative discomfort.²

There have been various pharmacological drugs that have been used to prevent PONV, some of them includes histamine antagonists, dopamine receptor antagonists, anticholinergic, dexamethasone, neurokinin antagonists and serotonin antagonists. Although these agents have some unwanted side effects that includes excessive sedation, dry mouth, hypertension, hallucinations, extrapyramidal symptoms and dysphoria.^{3,4}

Other class of drugs that have been used for PONV management included selective serotonin receptor (5-hydroxytryptamine type 3 [5-HT₃]) antagonists. These drugs work by

inhibiting serotonin from binding to 5-HT₃ receptors on vagus terminalis thus blocking the signals to the vomiting centre in medulla oblongata. Also, it has demonstrated least side effects and thus making it first line of drug for reducing incidence of PONV after laparoscopy surgery.

The present study was conducted to compare the efficacy of Ramosetron and Palonosetron in preventing PONV in patients undergoing laparoscopic surgery. Both the drugs are 5-HT₃ antagonist which each having their won advantages. Ramosetron is reported to have longer duration of action and have a slower dissociation time whereas palonosetron have a higher binding affinity and more half-life.⁶

METHOD AND MATERIAL

The present study was conducted at the department of anesthesia after taking approval from institutional ethical committee. Seventy patients of either gender between the ages of 18 and 60 who have an ASA grade I status 2 who consented for the study in written were include in the study. Patients who were pregnant, with acid peptic disease, on antiemetics or steroids, with a pre-operative history of nausea and vomiting on

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alcohol, allergic to trial medicine were excluded from the study. Patients were randomly distributed into 2 groups (n = 35 each) by block randomization method. Both

Group A: were administered .075 mg palonosetron intravenously (IV).

Group B: were administered 0.3 mg intravenous Ramosetron (IV).

Both the groups received the drugs 10 minutes before GA was induced.

Patients were induced with IV propofol 2 mg/kg and intubated with succinyl choline and muscular relaxation was accomplished with vecuronium bromide 0.08 mg/kg after premedication with fentanyl 2 g/kg¹⁴ and glycopyrrolate¹⁴ 5 g/kg. Patients were given neostigmine 0.05 mg/kg and glycopyrrolate 0.2 mg to help them wake up from general anesthesia. All vital signs, such as pulse, blood pressure, respiratory rate, temperature, Saturation of Peripheral Oxygen (SpO₂), and electrocardiogram (ECG), were monitored intraoperatively and postoperatively at 0, 6, 12, 24, and 48 hours.

The efficacy of both the drugs was recorded on base of parameters such as nausea, vomiting or usage of rescue medication. Nausea severity was measured by using verbal rating scale (no nausea 0, mild nausea 1–3, moderate nausea 4–6 and severe nausea 7–10). For patients developing severe nausea and vomiting, metoclopramide (10 mg) was administered IV as a rescue medicine. Other adverse side effects such as itching, hypotension was also evaluated for accessing safety during and after surgery. The efficacy was assessed at day 0 and day 1.

RESULTS

No significant difference was observed in age, sex, weight and duration of surgery between both the groups (Table 1). It was observed that on day 0, 2 patients in group A had mild nausea while 1 had moderate and severe nausea each. In group B 3 patients presented with mild nausea while two patients had moderate nausea and one patient has severe nausea. On day 1, 2 patients presented with mild nausea in group A while 3 presented with mild nausea in group B. moderate nausea was seen in one patient each in both the group. No significant difference was observed in both groups with regard to nausea, vomiting, hypotension and use of rescue antiemetic.

DISCUSSION

The cause of PONV is unknown, but it is thought to be caused by anesthetic, surgical, patient, and patient-controlled analgesia (PCA). Female gender, nonsmoking, and a history of motion sickness or PONV are well-known patient specific risk factors, whereas nonspecific risks include the use of postoperative painkillers and the type of surgery performed, such as laparoscopy.¹ The increased prevalence of PONV during laparoscopy is explained by the surgical pneumoperitoneum compressing the gastrointestinal mucosa, which may cause intestinal ischemia and hence stimulate a serotonin release, resulting in PONV.⁷

PONV has thus been treated with a range of serotonin receptor (5-HT₃) antagonists with a similar mechanism (selective or competitive binding to 5-HT₃ receptors).⁸ The antiemetics ramosetron and palonosetron were compared in this study for the prevention of PONV during laparoscopic surgeries. In present study we found no significant difference in both the drugs regarding the incidence of PONV and other parameters such as hypotension, use of rescue drug at day of surgery and next day. The results of the present study were similar to the study conducted by Lee *et al.* who showed no significant differences between ramosetron and palonosetron in the incidence of PONV in patients who underwent gynecological laparoscopy.^{9,10} Ahn *et al* in their systemic review showed that combined result of the four studies considered for PONV could not predict the differences between the effectiveness of palonosetron and that of ramosetron on early PONV which was in accordance to the present study.¹¹

Roh *et al.* in evaluated same drugs in patients undergoing lumbar spinal surgery and showed that the ramosetron group had a lower overall incidence of PONV than the palonosetron group. The ramosetron group had lower nausea intensity scores till 6 and 24 hours postoperatively than the palonosetron

Table 1: Comparison of basic parameters of study population

Parameters	Group A	Group B	P value
Age	29.4 ± 8.94	29.31 ± 9.04	.46
Sex (male)	23	21	.62
Weight	57.1 ± 4.89	58.05 ± 4.9	.27
Duration of surgery (min)	47.5 ± 7.9	46.7 ± 9.1	.31

Table 2: Evaluation of nausea at day 0

VRS	Group A	Group B	p-value
Nil	31	29	.89
Mild	2	3	(Chi square = .6)
Moderate	1	2	
Severe	1	1	
Total	35	35	

Table 3: Evaluation of nausea at day 1

VRS	Group A	Group B	p-value
Nil	32	31	.9
Mild	2	3	(Chi square = .21)
Moderate	1	1	
Severe	0	0	
Total	35	35	

Table 4: Comparison of the efficacy of both the drugs at day 0 and day 1.

	Group A	Group B	p-value
No. of vomiting instances (day 0)	3	2	NS
No. of vomiting instances (day 1)	2	1	NS
Incidence of hypotension (day 0)	1	2	NS
Incidence of hypotension (day 1)	0	0	NS
Rescue antiemetic (day 0)	3	2	NS
Rescue antiemetic (day 1)	2	1	NS

group. For 72 hours after surgery, the ramosetron group had considerably lower pain intensity levels than the palonosetron group. This was in contrast the present study.¹²

The use of rescue medicine was dependent on vomiting instances which was similar in both the groups, also no significant difference was observed in the incidence of hypotension in both the group.

CONCLUSION

Our study showed that Palonosetron and ramosetron were both equally efficacious in controlling PONV in a patient undergoing laparoscopic surgery under general anaesthesia.

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