International Journal of Medical and Health Research
ISSN: 2454-9142, Impact Factor: RJIF 5.54
www.medicalsciencejournal.com
Volume 3; Issue 6; June 2017; Page No. 118-120

A retrospective comparison of the effectiveness of ramosetron & ondansetron for the prevention of post-operative nausea

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Abstract
The Post-operative nausea and vomiting (PONV) is accountable for a conjoint obstacle of surgery and anaesthesia. Many of the patients have described that averting of PONV is of higher distress than escaping post-operative pain. PONV is also related with deferred release from the recovery room and persistent hospital care and, consequently it results in the increase in the health care expenditures.

The study was conducted in the Hind Institute of Medical Sciences Mau, Ataria, sitapur. The age group of the patients is ranges from 25 to 65 years. Total 100 patients were evaluated for the study. As per the classification of the American Society of Anaesthesiologists I and II physical conditions were enrolled on to the study. Patients were randomly allocated to one of the following two groups to receive either injection ramosetron 0.3 mg IV or injection ondansetron 6 mg IV just before intubation.

From the data obtained in the present study it can be concluded that ramosetron 0.3 mg is quite effective in controlling postoperative nausea and vomiting. It also lessens PONV score and occurrence of nausea in first 24 hours post operatively. We observed that the benefit was more in the later stages of the postoperative period.

Keywords: ramosetron, ondansetron, Post-operative nausea and vomiting etc

Introduction

The Post-operative nausea and vomiting (PONV) is responsible for a conjoint hurdle of surgery and anaesthesia. Even yet it is infrequently lethal, PONV is spiteful and related with patient uneasiness, and unhappiness with their pre-operative precaution.

Many of the patients have described that averting of PONV is of higher distress than escaping post-operative pain. PONV is also related with deferred release from the recovery room and persistent hospital care and, consequently it results in the increase in the health care expenditures.

The PONV morbidity consists of the symptoms like wound dehiscence, dehydration, electrolyte disturbance, interference with nutrition and, more rarely, oesophageal rupture or aspiration pneumonitis. It is significant that group of peoples responsible for the caring for surgical patients recognise PONV. There was a survey established in the year of 2000 revealed awareness breaches. There are only 60 per cent of ward nurses were giving correct responses for the survey [1].

The generally administered emetogenic drugs in anaesthesia comprise nitrous oxide, physostigmine and opioids. The intravenous anaesthetic propofol is presently the least emetogenic general anaesthetic. These medications are assumed to arouse the chemoreceptor trigger zone (CTZ). This area is on the floor of the fourth ventricle and is effectually outside of the blood-brain barrier. This marks it enormously profound to toxin and pharmacological stimulation. There are plentiful neurotransmitters such as histamine, dopamine, serotonin, acetylcholine, and the more recently discovered neurokinin-1 (substance P) [2].

The rigorous nature of vomiting passage ways are also not fully implicit but a number of pathophysiological mechanisms known to cause nausea or vomiting have been recognized. The foremost coordinator is the vomiting centre, a group of neurones situated in the medulla oblongata [3]

Ramosetron (INN) is a serotonin 5-HT3 receptor antagonist for the treatment of nausea and vomiting [4]. Ramosetron is also indicated for a treatment of "diarrhea-predominant irritable bowel syndrome in males" [5]. In India it is marketed under the brand name of I Bset. Ondansetron, marketed under the brand name Zofran, is a medication used to prevent nausea and vomiting caused by cancer chemotherapy, radiation therapy, or surgery. It is also useful in gastroenteritis. It has little effect on vomiting caused by motion sickness. It can be given by mouth, or by injection into a muscle or into a vein [6].

The present study was planned to study the effectiveness of ramosetron and its comparison with ondansetron in the prevention of PONV in patients undergoing different conditions pyelolithotomy, pyeloplasty, and upper ureterolithotomy under general anesthesia.

Methodology

The study was conducted in the Hind Institute of Medical Sciences, Mau, Ataria, sitapur. The age group of the patients is ranges from 25to 65 years. Total 100 patients were evaluated for the study. As per the classification of the American Society of Anaesthesiologists I and II physical conditions were enrolled on to the study. After taking informed written consent and approval of the Institutional Ethics Committee.

Following was the inclusion and Exclusion criteria of the study:

Inclusion Criteria

1. Age 25- 65 years
2. American Society of Anaesthesiologists I and II physical conditions patients

Exclusion Criteria

1. Patients with a history of motion sickness, migraine, muscular dystrophy, or any other neurological problems
2. Patients at particular risk of heart conditions, such as congenital disease
3. Patients who were predisposed to low levels of potassium and magnesium in the blood
4. Patients on other medications that lead to QT prolongation
5. Patients who received antiemetic within 48 h before surgery
6. Patients with a history of recurrent vomiting in the postoperative period
7. Pregnant/lactating females.

Patients were randomly allocated to one of the following two groups to receive either injection ramosetron 0.3 mg IV or injection ondansetron 6 mg IV just before extubation.

Results & Discussion

The data from the selected study group was collected and presented as below.

Table 1: Age, Height & Duration of Surgery

Particular	Ondansetron Group	Ramosetron Group
Age (years)	26-62	27- 52
Height (cm)	140 - 165	145- 168
Weight (kg)	55 – 68	61 – 72
Surgery duration (min)	70 – 85	75 – 90

The data in the table 1 indicates age, height and duration of the surgery in the enrolled study group patients.

Table 2: Distribution of patient experiencing nausea

Nausea Occurrence	Ondansetron Group	Ramosetron Group
Immediately	15	12
0 -3 hrs	10	6
3 – 6 hrs	12	8
6 – 12 hrs	10	6
12 – 24 hrs	16	15

The table 2 indicates the data of the occurrence of the nausea after the surgery. About 15% ondansetron & 12% Ramosetron patients experience nausea immediately. About 10% ondansetron & 6% Ramosetron patients experience nausea after 3 hrs of surgery. Ondansetron group patients include more cases of the nausea occurrence over different time period compared to Ramosetron group patients.

Table 3: PONV Score

Score	Ondansetron Group	Ramosetron Group
No Nausea & Vomiting	62	76
Incident of Nausea	28	18
Incident of Vomiting	10	6
Total	100	100

Table 3 indicates PONV score of the in the both the study group. 62% of the patients in the Ondansetron group showed no nausea and vommating, whereas 76% of the cases in the Ramosetron group expressed similar situation.

Only 28% cases in Ondansetron group & 18% cases in Ramosetron Group showed the incident of Nausea. Only 10% cases in Ondansetron group & 6% cases in Ramosetron Group showed the incident of Vomiting.

Table 4: Side effects

	Ondansetron Group	Ramosetron Group
Dizziness	40	32
Headache	14	22

Table 4 indicates the side effects in the both the study group. The Ondansetron group had 40 cases of the dizziness whereas 14 cases of the headache. The Ramosetron group had 32 cases of dizziness and 22 cases of the headache.

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 [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 colleagues [11] 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 [11].

Conclusion

We conclude that ramosetron 0.3 mg is quite effective in controlling postoperative nausea and vomiting. It also reduces PONV score and incidence of nausea in first 24 hours post operatively. We observed that the benefit was more in the later stages of the postoperative period.

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