

Comparison of Ondansetron with Dexamethasone and Ondansetron as Postoperative Nausea and Vomiting Prophylaxis in Middle Ear Surgeries

Sulochana Dash*, C.B. Sridhar**

Abstract

Postoperative nausea & vomiting (PONV) is one of the most common and distressing complication during postoperative period increasing morbidity and cost of medical care. This study was conducted to compare the efficacy of Ondansetron with that of Ondansetron and Dexamethasone combination in PONV prophylaxis. **Methodology:** This prospective randomized controlled study was conducted at our institution over a period of one year where 80 patients belonging to ASA 1 & 2 who were posted for elective middle ear surgery were included. Pts were randomly divided into two groups group 1 & group 2 having 40 pts in each. Group 1 pts received Ondansetron 4 mg at the end of surgery and group 2 pts received Dexamethasone 8 mg at induction of anaesthesia and Ondansetron 4mg at the end of surgery for PONV prophylaxis. Number of episodes of nausea, vomiting and doses of rescue antiemetics used were recorded during 0 - 6hrs, 6- 12 hrs & 12 - 24 hrs during the postoperative period. **Results:** The no. of pts who had nausea & vomiting were more in group 1 compared to group 2, but the result was not statistically significant. But no. of pts who required rescue

antiemetic in group 1 was significantly higher than that of group 2. **Conclusion:** So for effective PONV prophylaxis combination of Ondansetron and Dexamethasone is superior to Ondansetron alone.

Keywords: Postoperative Nausea and Vomiting; Ondansetron; Dexamethasone.

Introduction

Postoperative nausea and vomiting (PONV) is one of most common postoperative complication of anaesthesia leading to increased morbidity and adds to the cost of medical care. The average incidence of PONV is 30 to 50% and in patients (pt) with high risk of PONV, the incidence may go up to 80%[1]. There are multiple risk factors like female sex, history of migraine and PONV, smoking, duration of surgery, type of anaesthetic technique and type of surgery. Among the surgical procedures middle ear surgery is one which results in increased incidence of PONV. There are multiple factors like anaesthetic agents used, pt characteristics, manipulation of middle ear during surgery and postoperative care which might contribute to nausea and vomiting[2,3]. There are many antiemetic drugs available among which 5HT3 receptor

antagonist such as Ondansetron, Granisetron, Polanosetron are mostly used. Though 5HT3 receptor antagonists are gold standard antiemetics these are not much effective in prevention of nausea. Dexamethasone effectively prevents both nausea and vomiting in postoperative patients [4]. So far many studies have been conducted to find out the best technique to prevent PONV. This study has been conducted to compare the efficacy of Ondansetron with that of Dexamethasone and Ondansetron combination in PONV prophylaxis.

Methodology

This prospective randomized study was conducted at our institution over a period of one year where 80 patients who were posted for elective middle ear surgery were enrolled after obtaining informed consent. Patients aged between 18 to 60 years belonging to ASA class 1 &

Author's Affiliation:

*Associate Professor **Professor,
Department of Anaesthesiology,
Saveetha Medical College, Chennai,
Tamilnadu.

Corresponding Author:

Sulochana Dash, At-
Vijayashanthi infinite, tower-
1-6A, Po-chettipedu, Thandlam,
Tamilnadu, Pin- 602105.
E-mail: dr.silu76@gmail.com

Received on 10.03.2017

Accepted on 17.03.2017

2 were included in the study. Patients on chronic use of steroids, antiemetics, narcotic drugs and having hypersensitivity to Ondansetron and Dexamethasone were excluded from the study.

Patients were randomly divided into two groups, Group 1 (n=40) and Group 2 (n=40). Group 1 was received Ondansetron 4mg IV and Group 2 received Ondansetron 4mg plus Dexamethasone 8 mg IV for PONV prophylaxis. All the patients were kept nil per oral from the night before surgery and premedicated with Tab. Alprazolam 0.5mg and Tab. Ranitidine 150mg PO on the night before and the morning of surgery. After shifting the patient to operating room (OR) IV line was secured. Monitors were (NIBP, Pulse oxymetry & ECG) connected and base line parameters were recorded. In the OR inj. Midazolam (0.05mg/kg) and inj. Glycopyrrolate (0.2mg) was administered. Inj. Morphine 0.1mg/kg was administered for analgesia. Patients were induced with Inj. Propofol 2mg/Kg and Inj. Vecuronium 0.1 mg/Kg. Group 2 patients were administered with inj. Dexamethasone 8mg IV after induction. Anaesthesia was maintained with Oxygen, Nitrous Oxide and Isoflurane in low flow (O₂ 0.5L, N₂O 0.5L & Isoflurane 1%) with intermittent doses of vecuronium. At the end of surgery all the patients (Group 1 & 2) were administered inj. Ondansetron 4mg for PONV prophylaxis and neuromuscular block was reversed

with Neostigmine and glycopyrrolate. After adequate recovery patients were shifted to post anaesthesia care unit (PACU) for monitoring for 24 hours. Number of episodes of nausea (unpleasant sensation with urge to vomit) and vomiting (forceful expulsion of gastric content) during 0 to 6 hrs, 6 to 12 hrs and 12 to 24 hrs were recorded and number of patients who needed rescue antiemetic (Inj. Ondansetron 4mg IV) used were recorded. Postoperative analgesia was managed with Inj. Ketorolac. Statistical analysis was done by using SPSS software for windows version 17. Student-t test and Pearson's Chi-square test were used for statistical analysis.

Results

Data of all 80 study patients was collected and analysed. The demographic parameters like age, sex, body weight and ASA physical status and duration of surgery in both the groups were comparable to each other. Although the number of patients having nausea were more in group 1 compared to group 2 (Table 1), the result was not statistically significant (P value > 0.05). Similarly the number of patients having vomiting was also more in group 1 as compared to group 2 but again the result was not statistically significant (Table 2).

Table 1: Showing nausea in both the groups

Study groups	Number of patients having nausea		
	0 - 6 hrs	6- 12hrs	12 - 24 hrs
Group 1	9(22.5%)	5(12.5%)	2(5%)
Group 2	4(10%)	1(2.5%)	0%
P value	0.13 (NS)	0.09(NS)	0.15(NS)

NS= not significant.

Table 2: Showing vomiting in both the groups.

Study groups	Number of patients having vomiting		
	0 - 6 hrs	6- 12hrs	12 - 24 hrs
Group 1	6(15%)	1(2.5%)	0%
Group 2	2(5%)	0%	0%
P values	0.13(NS)	0.3(NS)	NS

NS= not significant.

But the number of pts who required rescue antiemetic in group 1 were 42.5%(n=17) and in group

2 were 5%(n=12.5%)(table 3), which is statistically significant (P value = 0.003).

Table 3: Showing use of antiemetic

Study Group	No of patients requiring rescue antiemetics
Group 1	17(42.5%)
Group 2	5(12.5%)
P value	0.003(Significant)

Discussion

PONV is one of the most common complications during postoperative period. The incidence is 30 to 50% and in patients who are at high risk for PONV, it might go up to 80% [5,6]. Surgical procedure in middle ear is associated with higher risk of PONV the causes of which is multifactorial like changes in middle ear pressure during surgery, anaesthesia technique, duration of surgery, type of analgesics used and patient factors like age, sex, body weight and comorbid illnesses. Stimulation of CTZ (chemoreceptor trigger zone) through vestibulo-cochlear nerve during surgery is thought to be the cause of increased PONV [7].

Commonly used antiemetics for PONV prophylaxis include 5-HT₃ receptor antagonists (ondansetron, Granisetron, dolasetron, etc), corticosteroids (dexamethasone), butyrophenones (droperidol and haloperidol) and anticholinergics (scopolamine). Among these drugs Ondansetron is the gold standard antiemetic but it has lesser anti-nausea effects compared to its anti-vomiting effect. Studies show Dexamethasone is effective in preventing both nausea and vomiting in postoperative patients [8,9]. Preoperative dexamethasone 8 mg IV enhances the postoperative quality of recovery in addition to reducing nausea and pain [10]. In this study though the incidence of nausea during 0-6 hrs postoperative period was higher (22.5%) in group 1 compared to group 2 (10%) but the result was not statistically significant. Similarly the incidences of nausea at 6-12 & 12-24 hrs were high in group 1 compared to group 2 but difference was not significant which is similar to Khalid Ahsan et al study [11]. But a similar study by Raza Muhammad et al shows the incidence of nausea is significantly higher in early postoperative period in Ondansetron group compared to Ondansetron plus Dexamethasone combination group, this difference could be due to smaller sample size in our study [12]. The comparison of incidences of vomiting in two groups over 24 hrs in our study also showed that group 1 had higher incidence compared to group 2 but the result was not statistically significant. This study is similar to study by Fujii et al where the investigator had used Granisetron in place of Ondansetron [13]. Thomas R et al study also shows similar results of vomiting in patients who underwent day care gynaecological surgery [14]. Although the incidences of nausea and vomiting in our study didn't reveal any statistically significant difference in the two groups, the number of patients who required antiemetic therapy in group 1 was significantly higher than that of group 2 (42.5%

vs 12.5%). Study by Lopez-Olaondo et al and Panda et al also showed similar results of rescue antiemetic requirements [15,16]. The result of our study and studies by other authors showed that combination therapy is superior to only ondansetron therapy for PONV prophylaxis in patients who are at high risk for PONV.

Conclusion

To conclude combination therapy with dexamethasone and Ondansetron is more effective and safer technique than Ondansetron alone for PONV prophylaxis in patients at high risk for PONV. But still further studies are needed to come out with a better result.

Conflicts of Interest: Nil.

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