Nausea and vomiting after ENT surgeries: A comparison between ondansetron, metoclopramide and small dose of propofol

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Abstract

Aims To evaluate the antiemetic efficacy of ondansetron, metoclopramide or small dose of propofol following ear, nose and throat (ENT) surgery.

Materials and methods A prospective randomized study involving 60 patients, both children and adults undergoing elective ENT surgery under standard general anesthesia. At the completion of surgery the patients received either 0.1 mg/kg of ondansetron or 0.2 mg/kg of metoclopramide or 0.5 mg/kg of propofol intravenously. The patients were observed for 24 hrs after operation for any occurrence of nausea and vomiting.

Results The incidence of postoperative nausea and vomiting (PONV) during first 24 hrs was recorded in 20%, 70%, 50% of patients who had received ondansetron, metoclopramide or propofol respectively ($p < 0.05$). Fewer patients given ondansetron needed rescue antiemetic. The incidence of PONV was higher following middle ear surgery.

Conclusion It was concluded that ondansetron was most effective in preventing occurrence of PONV while metoclopramide was least effective. Propofol was effective only in 50% of patients, thus not recommended for routine use.

Keywords Postoperative nausea and vomiting · Ear, nose and throat surgery · Ondansetron · Metoclopramide · Propofol

Introduction

Although rarely life threatening, postoperative nausea and vomiting (PONV) may be one of the most unpleasant memory associated with patients hospital stay. ENT surgeries have a high incidence of postoperative emesis when no prophylaxis is done (Furst et al. 1994, Honkavaara 1996) [1, 2]. As patients undergoing ENT surgeries are otherwise healthy and ambulant, the occurrence of nausea or vomiting can make them sick and hence delay the discharge from hospital. Ondansetron and metoclopramide are common and well established antiemetics in the postoperative setup. Propofol an anesthetic agent possesses antiemetic action. Recent studies have reported excellent antiemetic effect of sub hypnotic dose of propofol following thyroid surgery (Ewalenko et al. 1996, Fujii et al. 2001) [3, 4] but it has not been used for other ENT surgeries. We therefore conducted a study to investigate the possible antiemetic effect of small dose of propofol following ENT surgeries and compared it with ondansetron and metoclopramide, the most commonly used antiemetics in our ENT ward.

Materials and methods

We studied 60 ASA (American Society of Anaesthesiologists) physical status grade I and II patients of both sexes between 8 to 38 years of age, undergoing elective ENT surgery. Institutional approval and informed consent was obtained before the study. Number patient had received any antiemetic medication during 24 hrs prior to surgery. All adult patients received oral alprazolam in the morning of operation. In the operation theatre all the patients were

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given glycopyrrolate intravenously just prior to induction. Anesthesia was induced with thiopentone sodium (4–7 mg/kg) and fentanyl (1–2 µg/kg). Endotracheal intubation was performed after succinylcholine (1–1.5 mg/kg). Anaesthesia was maintained on O₂, N₂O and halothane. Atracurium was used for neuromuscular blockade. Ventilation was manually controlled on Bain circuit to keep an end tidal concentration of CO₂ at 35–40 mmHg. At the end of surgery the patients received in a random manner either ondansetron (0.1 mg/kg) or metoclopramide (0.2 mg/kg) or propofol (0.5 mg/kg) intravenously. Neuromuscular block was antagonized using neostigmine and atropine in standard doses and tracheal extubation was done when the patients were fully awake. Postoperative analgesia was provided with intramuscular diclofenac or tramadol on as and when required basis.

Postoperatively all the episodes of nausea and vomiting during the first 24 hrs were recorded. The patients or their parents were asked if vomiting had occurred or if the patients felt nauseated with only two possible answers (Yes/No). Occurrence of emetic symptoms, need for supplemental antiemetics, sedation or any adverse effects were recorded at 3 hrs (in recovery room) and 24 hrs (in ward) after operation. Rescue antiemetic (granisetron) was given if more than 2 episodes of retching or vomiting had occurred or the patient had persistent nausea.

Statistical analysis was employed using analysis of variance and student 't' test as appropriate and $p < 0.05$ was considered as significant.

Results

Sixty patients were enrolled in this study and they were similar regarding distribution of age, sex and type of surgery Table 1. The overall incidence of nausea, vomiting was lower in patients who had received ondansetron (20%) than in those who had received metoclopramide (70%) or small dose of propofol (50%) Table 2. A complete response i.e., no nausea or vomiting was observed in 100% patients in ondansetron group in early postoperative period compared to 60 and 45% in propofol and metoclopramide groups respectively. The incidence of PONV was higher after middle ear surgery. The most common adverse effects were

headache, dizziness and sedation but none were serious to need treatment.

Discussion

Controversy in the prophylactic use of routine antiemetic before surgery still persists, probably because of multifactorial etiology and also due to different risk of emetic sequelae in different patient population (Sennaraj et al. 2002) [5]. The incidence of vomiting after ENT surgeries is relatively high, justifying the use of pharmacological prophylaxis (Fujii et al. 1998) [6].

In this study the patients were evenly distributed in the three groups regarding demographic data and type of surgery, therefore the incidence of PONV could be directly related to antiemetic medication. Ondansetron was most effective in reducing the incidence of PONV in majority of the patients compared to metoclopramide or small dose of propofol. Our results are in accordance with previous studies (Furst 1994, Hamid et al. 1998) [1, 7]. The overall incidence of PONV in propofol group was 50% with slightly lower incidence in early postoperative hours (40%). Similar to our results Zestos, et al. (1997) [8] has reported failure of propofol in treating postoperative vomiting in children undergoing tonsillectomy. Contrary to our results, small dose of propofol was effective in reducing incidence of PONV to 10 and 13% following thyroidectomy in trials of Ewalenko et al. (1996) [3] and Fujii et al. (2001) [4]. However former used continuous infusion of propofol in low dose. Our dose of propofol 0.1 mg/kg may not necessarily be the optimal dose for ENT surgeries. Metoclopramide was not able to prevent PONV in majority of the patients as 70% of patients vomited. Previous studies have documented failure of metoclopramide as postoperative antiemetic (Rowbotham 1992, Henzi et al. 2000) [9, 10].

It is of interest that the patients who vomited in all the groups had undergone middle ear surgery. This shows very high susceptibility of these patients for postoperative vomiting. The cause of vomiting after middle ear surgery is not known but many factors play their role including patients demography, history of motion sickness, anesthetic used

Table 1 Patient data

	Ondansetron group	Metoclopramide group	Propofol group
Age in yrs (Mean ± SD)	22 ± 15	20 ± 16	21 ± 13
Children/adult	6/14	5/15	5/15
Male/female	11/9	10/10	11/9
Middle ear surgery	14	13	13
Tonsillectomy	3	5	3
Others	3	2	4

Table 2 Incidence of nausea vomiting and relation with type of surgery

	Ondansetron group	Metoclopramide group	Propofol group
Patients with no nausea, vomiting in 24 hrs	16 (80%)*	6 (30%)	10 (50%)
Patients with no nausea, vomiting in 0–3 hrs	20 (100%)*	9 (45%)	12 (60%)
Vomiting after type of surgery			
➤ Middle ear surgery	14/4 (29%)*	13/11 (85%)	13/8 (64%)
➤ Tonsillectomy	–	5/2 (40%)	3/1 (33%)
➤ Others	–	2/1 (50%)	4/1 (25%)**
Patients requiring rescue antiemetic	1 (5%)*	7 (35%)	5 (25%)

* $p < 0.001$ in relation to groups metoclopramide and propofol

** $p < 0.05$ in relation to group metoclopramide

and increased middle ear pressure due to N_2O ((Larsson et al. 1995, Reinhart et al. 1994) [11, 12]. Thus probably more effective antiemetic will be required for these surgeries such as combination of ondansetron and dexamethasone (Fujii et al. 1998) [6].

On the basis of our results we conclude that ondansetron is a suitable choice for the prophylaxis of nausea and vomiting after ENT surgery. Although small dose of propofol reduced the incidence of nausea vomiting significantly compared to metoclopramide we do not recommend its routine use as only a very small amount (1–2 mL) is required and rest of the drug would go waste.

Key message: ENT surgeries especially middle ear carry a very high incidence of PONV necessitating use of prophylactic antiemetics. Among the three possible alternatives used in this study ondansetron was found to be most effective.

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