Comparison of ondansetron and metoclopramide antiemetic prophylaxis in maxillofacial surgery patients

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Purpose. The purpose of this study was to compare the efficacy of ondansetron and metoclopramide, administered for the prophylaxis of vomiting in patients undergoing oral and maxillofacial surgery under general anesthesia.

Methods. One hundred patients undergoing mandibular osteotomy surgery were studied. Patients were allocated randomly to receive 1 of 2 treatment regimens: 0.15 mg/kg ondansetron or 0.5 mg/kg metoclopramide intravenously 30 minutes before extubation. All were adults and were treated by one surgeon and all operations were the same and lasted 2.5 to 3.0 hours. The patients were assessed at 3 time periods: 0 to 3 hours, 3 to 12 hours, and 12 to 24 hours postoperatively for emesis.

Result. The data from this study showed that during the first 24-hour postoperative period, patients receiving ondansetron following general anesthesia had an 11% (11 patients) incidence of emesis compared with 28% (22 patients) in the group that received metoclopramide.

Conclusion. In this study, ondansetron (0.1 mg/kg) was twice as effective in preventing postoperative vomiting compared with metoclopramide. (Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011;111:275-277)

Postoperative vomiting (POV) is a relatively common complication following general anesthesia.1 It is of concern to patients and doctors involved in maxillofacial procedures, specifically those mandating jaw fixation and immobilization. There is often fear of aspiration if the patient vomits postoperatively. Postoperative vomiting may also predispose these patients to increased pain, bleeding, dehydration, electrolyte imbalance, and delayed wound healing. Thus, it is prudent to minimize or prevent vomiting in these patients.

There is considerable literature comparing the efficacy of ondansetron with other antiemetics in surgical patients. However, none were found similar to our study. Most were related to general surgery procedures in which none were maxillofacial patients with intermaxillary fixation (IMF). IMF may predispose to aspiration. In this study we assessed the antiemetic efficacy of ondansetron and metoclopramide in patients undergoing oral and maxillofacial surgery.

PATIENTS AND METHODS
Following institutional ethics board approval and patient consent, 100 patients undergoing mandibular osteotomy surgery were studied. Patients were allocated randomly to receive 1 of 2 treatment regimens: 0.15 mg/kg ondansetron or 0.5 mg/kg metoclopramide intravenously 30 minutes before extubation. All were adults and were treated by one surgeon, and all operations were the same and lasted 2.5 to 3.0 hours. Personnel not involved in the study prepared identical syringes containing the drugs. A standardized general anesthetic technique was used. Anesthesia was induced with 2.0 mg/kg propofol and 1 μg/kg fentanyl, and patients were maintained with 2.0% sevoflurane (inspired concentration) and 66% nitrous oxide in oxygen.
Ventilation was controlled mechanically via an endotracheal tube (adjusted to maintain end-tidal carbon dioxide concentration at 4.5 kpa throughout the surgery). Neuromuscular relaxation was achieved with vecuronium 0.1 mg/kg and was not reversed. All other drugs administered, i.e., narcotics, were of the same dosage and given at the same time pre- or postoperatively. Throat packs ensured that nothing was aspirated intraoperatively. Patients were transferred to the recovery area once adequate spontaneous respirations were established and the endotracheal tube was removed once the patient was awake. The patients were assessed at 3 time periods: 0 to 3 hours, 3 to 12 hours, and 12 to 24 hours postoperatively for emesis following the urge to vomit; defined as labored, spasmodic, rhythmic contraction of the respiratory muscles without expulsion of gastric contents. Patients with postoperative oral or nasal bleeding, or those who vomited blood were excluded. Patients were assessed for postoperative vomiting for 24 hours postoperatively.

**RESULT**

Following final analysis of the data, this study showed that during the first 24 hours postoperatively, patients receiving ondansetron had an 11% (11 patients) incidence of emesis compared with 28% (22 patients) in the group that received metoclopramide. The mean time to the first emetic episode was greater in the ondansetron group compared with the group that did not receive ondansetron (207 minutes versus 135 minutes). The ondansetron group required less additional medication following emesis (5%, 5 patients) compared with metoclopramide (10%, 10 patients). The patients in the ondansetron group who were given a second injection of medication had no further episodes of emesis. The metoclopramide group, which required further medication, had at least one other episode of emesis following the second administration of this medication.

**DISCUSSION**

POV is a topic of great concern to anesthesia care providers, especially in patients in IMF postoperatively. The etiology of POV after surgery under general anesthesia remains elusive, but is probably multifactorial. Age, gender, smoking habits, past history of previous POV, lengthy procedure, oral or nasal oozing leading to ingestion of blood, and use of postoperative opioids are of importance in predicting POV. In our study, many confounding factors were well balanced between groups, so that differences between groups may be attributed to differences in the antiemetic drugs administered. Complications of POV include possible wound disruption, esophageal tearing, gastric herniation, muscular fatigue, dehydration, and electrolyte imbalance. There is also an increased risk of aspiration of gastric contents. POV can have psychological effects that may result in patients experiencing anxiety about undergoing further surgery. Ondansetron is a selective serotonin receptor antagonist that is approved for prevention of postoperative nausea and vomiting. Various studies have shown a very high average incidence of nausea (68%) and vomiting (53%) during the 48 hours after surgery. Fixed-dose ondansetron reduced the 48-hour incidence of vomiting by about 20 percentage points (i.e., 1 of 5 treated patients benefited). The most consistently reported adverse effects from ondansetron were headache and transient liver enzyme abnormalities. Other factors generally considered to be important are personnel time in cleaning up and costs of disposable products, laundry, caring for patients, delayed discharge, and other costs. There are more than 100 articles comparing the efficacy of ondansetron in surgical patients; none were found to be similar to our study, as most relate to general surgery procedures. Thus, they were not maxillofacial patients with IMF potentiating aspiration. Jokela et al. showed that the incidence of POV was lower after premedication with ondansetron than with metoclopramide. Considering the entire 24-hour postoperative period, the incidence of POV was lower after oral ondansetron compared with metoclopramide administration. A study by Alexander and Fennelly concluded that oral premedication with ondansetron 8 mg was superior to 10 mg metoclopramide and placebo in preventing postoperative nausea and vomiting following major orthopedic surgery. In another study, Rodrigo et al. found that patients who vomited twice or more and the number who required a rescue antiemetic were significantly fewer in the ondansetron group compared with placebo. More recently, Sandhu et al. found the incidence of vomiting to be 20% for metoclopramide and 2.5% for ondansetron, and concluded that ondansetron 4 mg given intravenously at the end of surgery was effective for preventing vomiting after laparoscopic cholecystectomy. Bolton et al. stated ondansetron 0.1 mg/kg was superior to metoclopramide 0.5 mg/kg for the prophylactic control of POV in children undergoing tonsillectomy. In our study, ondansetron (0.1 mg/kg) was significantly more effective in preventing POV compared with metoclopramide in patients undergoing maxillofacial surgery.

**CONCLUSION**

This study demonstrated that ondansetron (0.1 mg/kg) was twice as effective in preventing postoperative vomiting compared with metoclopramide.
REFERENCES


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