

COMPARISON OF EFFICACY OF DEXAMETHASONE AND OROGASTRIC SUCTION IN REDUCING POST TONSILLECTOMY VOMITING IN CHILDREN

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ABSTRACT

Background: The use of gastric suction has been advocated while dexamethasone reduces postoperative vomiting and pain. The objective of the study was to compare effectiveness of gastric suction with an orogastric tube and the effect of a single dose of dexamethasone in reducing post tonsillectomy vomiting in children.

Material and Methods: This was a Randomized control analytical study conducted at the ENT Department, Ayub Teaching Hospital, Abbottabad from January 2012 to June 2012. A total of 90 patients included in this study were randomized to three groups. Group 1 received dexamethasone 0.5 mg/kg intravenously (maximum dose 8mg) after the induction of anesthesia. Group 2 underwent gastric suction with an orogastric tube placed under direct visualization while the patients were still under general anesthesia and Group 3 received nothing. The frequency of vomiting, number of episodes of vomiting and the need for rescue antiemetics were noted.

Results: The mean age of 90 patients was 7.7 ± 2.09 years. The frequency of vomiting was less in group 1 than 2 & 3. The mean number of episodes of vomiting in the three groups was 0.43, 0.76 and 0.9 respectively. The rescue antiemetics were required in 7% of group 1, 14 % in group 2 and 17 % in group 3.

Conclusion: Per operative single bolus dose of dexamethasone decreases the frequency of postoperative vomiting in children.

Key Words: Tonsillectomy, Postoperative nausea and vomiting, Dexamethasone

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INTRODUCTION

In Otolaryngology, tonsillectomy and adenoidectomy are the most frequently performed surgical procedures in children.¹ Pain, nausea, vomiting, edema and poor oral intake are the most common morbidities following tonsillectomy.³ Tonsillectomy is associated with an incidence of postoperative vomiting ranging between 40% to 73%.^{4,6} The prevalence of postoperative nausea and vomiting may complicate about one third of surgical procedures.^{2,6} Persistent vomiting is costly both in terms of financial effect and potential medical sequela.⁷⁻⁹ The incidence of postoperative emesis is more frequent in pediatric patients than adults.^{4,10} The cause of postoperative vomiting in the pediatric population is thought to be multi factorial with patient characteristics, anesthetic medications, surgical manipulation, and postoperative care, all hypothesized to contribute.^{7,11,12}

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In response to this "Big 'Little' Problem",⁵ multiple studies have investigated the effects of newer anesthetic agents and antiemetic prophylaxis on postoperative vomiting.^{4,13} In general, the results of these studies have been mixed. Marginal improvements, unfavorable adverse effect profiles, and high costs have limited the universal adoption of any single protocol.^{4,14} The use of gastric suction in reducing postoperative vomiting has been advocated in the older medical literature and several review articles.^{7,11,15} However, recent studies have failed to demonstrate any benefit of gastric suction in reducing postoperative vomiting in gynecologic or general surgical patients.^{4,11}

Dexamethasone was first reported to be an effective antiemetic drug in patients receiving cancer chemotherapy. Recently, dexamethasone has been found to have a prophylactic effect on postoperative vomiting in adults undergoing laparoscopic and gynecological surgery and in children undergoing tonsillectomy and strabismus surgery.^{4,6,11} Dexamethasone lacks side effects when used as a single injection and has a low cost and a

prolonged biological half life of 36 to 48 hours.^{4,26} Also, it has combined antiemetic and anti-inflammatory effects that may decrease postoperative edema and subsequently may improve oral intake after tonsillectomy. However, many reports have questioned the efficacy of dexamethasone as an antiemetic as well as its beneficial effect on the quality of oral intake after tonsillectomy. This controversy may be attributed to the wide range of dosage of dexamethasone as well as the wide variety of anesthetic techniques used.^{3,4,25}

The objective of this study was to compare the effect of gastric suction with an orogastric tube and the effect of a single intravenous bolus dose of dexamethasone on the frequency of post tonsillectomy vomiting in pediatric population.

MATERIAL AND METHODS

A Randomized control analytical study was conducted at the ENT Department, Ayub Teaching Hospital, Abbottabad from January 2012 to June 2012. The inclusion criteria were children of either sex below 13 years, with history of chronic tonsillitis, recurrent episodes of acute tonsillitis and/or hyperplastic obstructive tonsils causing sleep apnea syndrome. An exclusion criterion was patients who received antiemetics within 24 hour before surgery and children with any remarkable history of gastrointestinal disorders.

The patients were admitted in ENT ward and informed consent was obtained from all patients prior to surgery as a part of ethical practice. The registered 90 subjects were randomly allocated to three groups. Group 1 received intravenous dexamethasone 0.5 mg/kg (maximum dose 8mg) after the induction of anesthesia (n=30) while group 2 underwent gastric suction with an orogastric tube prior to extubation (n=30) and group 3 received nothing (n=30).

Hb, Bleeding time and clotting time and viral profile were done in all patients. Patients were fasted from midnight and were not given any premedications. The anesthetic protocol was standardized throughout the study. All patients underwent tonsillectomy by cold knife dissection method. The bleeding was controlled by bipolar diathermy or ligation. In group 1, dexamethasone was given intravenously as 0.5 mg/kg body weight (maximum dose 8mg). In group 2, an orogastric tube was placed postoperatively under direct visualization and the gastric contents were aspirated prior to emergence from anesthesia. A mouth gag was in place at the time of suctioning. In group 3, the patients neither received dexamethasone nor underwent

gastric aspiration. All children were transferred to the recovery room where standard monitoring was established, and they were observed for two hours. The frequency of vomiting, episodes of vomiting and the need for rescue antiemetics were recorded in the recovery room and then in the ward for 24 hours by the nurse who was unaware of the objective of study or groups of patients. Vomiting was defined as the forceful expulsion of gastric contents from the mouth. Retching and nausea were not considered vomiting for the purpose of this study. After transfer to the ward, a soft diet was offered to all children during their hospital stay. Also, a maintenance intravenous infusion was kept until their oral intake was judged adequate (oral ingestion of 100 ml of fluids and 100 ml of soft food within four hours). Patients who vomited more than twice in the hospital were treated with metochlorpropamide 0.15 mg/kg intravenously. Postoperative pain was addressed with rectal paracetamol 30 mg/kg every six hourly. Patients were observed for 24 hours after surgery and then discharged.

Demographic variables were gender and age in years. Research variables were the frequency, episodes of vomiting and the need (use) for rescue antiemetics. The nominal data was analyzed for frequency (number) and relative frequency (%) and the numeric data of age in years and episodes of vomiting were analyzed for mean, standard deviation and range by SPSS 11 (SPSS, Inc., Chicago, IL, USA).

RESULTS

A total of 90 patients were included in the study with 49 (54%) males and 41 (46%) females. They were randomized into three groups, group 1, 2 & 3 with 30 patients in each. In group 1 there were 16 (53%) males and 14 (47%) females, group 2 had 18 (60%) males and 12 (40%) females while group 3 had 15 (50%) males and 15 (50%) females.

The mean age of all the patients was 7.7 ± 2.09 (5-13) years. The mean age for the group 1, 2 and 3 were 7.7 ± 2.15 (5-13) years, 7.3 ± 1.99 (5-13) years and 8.05 ± 2.14 (5-13) years respectively.

Only seven (23%) patients in group 1 (dexamethasone) vomited as compared to 11 (37%) patients in group 2 and 13 (43%) patients in group 3. The incidence of vomiting was less in group 1 than group 2 and 3. The mean number of episodes of vomiting in the three groups was 0.43 ± 0.89 , 0.76 ± 10.4 and 0.9 ± 1.18 respectively. The episodes of vomiting were less in group 1 than group 2 and 3. The rescue antiemetics were required in two (7%) patients of group 1, four (13%) patients of group 2 and five (17%) of group 3. The need for antiemetics was less in group 1 than group 2 and 3.

DISCUSSION

Tonsillectomy is one of the most common procedures performed in hospitals throughout the world. Post operative vomiting represents one of the most common complications and the single most common reason for unplanned hospital admission following adenotonsillectomy.^{8,12,16} In a study of 1476 pediatric patients undergoing general anesthesia, Kermode et al¹² found a 24% overall incidence of postoperative vomiting and a 54% incidence of vomiting following tonsillectomy. Incidence of post tonsillectomy vomiting as high as 75% has been reported in the literature.^{12,17} In addition to the potentially fatal complications of dehydration, electrolyte imbalance and aspiration pneumonitis, vomiting has been reported to result in a level of physical and psychological distress exceeding that of the operation in 54% to 71% of patients surveyed in an ambulatory setting.^{8,9}

The use of a gastric tube to decompress the stomach is generally believed by anesthetists to be an effective way of decreasing postoperative nausea and vomiting. The efficacy of gastric suction in reducing postsurgical vomiting has been addressed in 2 recent prospective studies. Hovorka et al¹⁸ studied 201 patients who underwent hysterectomy and found no significant difference in the incidence of vomiting between patients who underwent postoperative gastric aspiration and patients who did not (79% vs 70% respectively). Trepanier and Isabel¹⁹ actually demonstrated a higher incidence of vomiting in patients who underwent postoperative gastric suction with an orogastric tube (17% vs 6.8%) in a study of 256 ambulatory general surgical patients. Older studies show conflicting results, some showing a beneficial effect¹⁵, while other reported either no effect²⁰ or a deleterious one.²¹ The efficacy of gastric suction in reducing post tonsillectomy vomiting is available indirectly from several studies. Ferrari and Donlon²² and Furst and Rodarte²³ in their investigations of the role of prophylactic antiemetics in reducing post tonsillectomy vomiting, required all patients, including the control groups, to undergo gastric suction. The incidence of vomiting in these control groups was high (62% and 70% respectively). In comparison, three similar studies evaluating prophylactic antiemetics were designed so that no patients underwent gastric suction. The control groups of these studies also had high incidences of post tonsillectomy vomiting (54%-73%).^{4,13,24} Although experimental and surgical variables preclude the direct statistical comparison of these studies, they seem to indicate that gastric suction may not significantly affect the incidence of post tonsillectomy vomiting. According to our study, aspiration

of gastric contents with orogastric suction in group 2 did not decrease the incidence of postoperative vomiting, the number of episodes of vomiting and the need of prophylactic antiemetics.

Dexamethasone is one of the most potent glucocorticoids available, being 25 times more potent than endogenous cortisol and has a 36-72 hour biological half-life. It suppresses a basic inflammatory response to tissue injury however, it must be delivered in high concentrations for maximal effectiveness.^{27,28} The role of dexamethasone as an antiemetic has been questioned in many reports.^{3,4} Dexamethasone exerts an antiemetic action via prostaglandin antagonism, release of endorphins, and tryptophan depletion.²⁹ However, it is not clear whether in this procedure dexamethasone exerts its effect by a central or peripheral mechanism. These therapeutic effects have led to the widespread use of dexamethasone in children undergoing tonsillectomy. April et al³⁰ found that treatment with intravenous dexamethasone (1 mg/kg up to 16mg) in children before electrocautery tonsillectomy and adenoidectomy decreases morbidity and increases early oral intake. Pappas et al³¹ observed a decrease in the overall incidence of postoperative vomiting, especially during the 24 hours after discharge, as well as an improvement in the postoperative quality of oral intake in children undergoing tonsillectomy who received dexamethasone 1 mg/kg after the induction of anesthesia as compared with those in a control group. No difference was observed between the two groups in the incidence of early vomiting. In Splinter and Roberts,³² study, dexamethasone decreased vomiting in children after tonsillectomy both during early post anesthesia recovery and delayed recovery. In Al-Khotum et al⁴ study, dexamethasone was found to decrease the incidence of postoperative vomiting and early return to normal diet in children undergoing tonsillectomy.

According to our study, the incidence of vomiting and number of episodes of vomiting was less frequent in the dexamethasone group. Also the need of rescue prophylactic antiemetics was less in the dexamethasone group as compared to other groups which is consistent with the results of Al-Khotum⁴ study. The incidence of vomiting in our study in the three groups [23%, 37 % and 43%, respectively with p value (0.259)] are comparable with other studies and that of Al-Khotum et al⁴ who reported 18 %, 34% and 37% incidence of vomiting between the three groups. The mean numbers of episodes of vomiting according to Al- Khotum⁴ study was 2.2, 2.4 and 2.3 while 0.8 and 0.7 between the two groups were reported by Jones et al⁷ in a study of eighty paediatric patients. Our study results of mean

number of episodes of vomiting between the three groups [0.4, 0.7 and 0.9, respectively with p-value (0.232)] are comparable with that of Jones et al.⁷ According to Al-Khotum et al⁴ study 13 % required rescue prophylactic antiemetics in patients who underwent gastric suction while 10 % in those who did not undergone gastric suction while our results showed 7 % in those who received dexamethasone, 13 % in those who underwent gastric suction and 17 % in those without gastric suction and dexamethasone with p value (0.467).

CONCLUSION

A single bolus dose of dexamethasone per operatively is advisable in reducing the incidence of vomiting in children undergoing tonsillectomy.

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