The effect of dexamethasone on postoperative vomiting and oral intake after adenotonsillectomy

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Adenotoncillectomy; Dexamethasone; Vomiting; Oral intake

Summary

Objective: Vomiting is one of the most important postoperative complications of adenotonsillectomy. This study was designed to determine the effectiveness of preoperative intravenous dexamethasone on postoperative emesis.

Methods: In a double-blind, placebo-controlled clinical trial, 100 patients aged 5—15 years, ASA classes I and II were randomly selected to receive either 0.5 mg/kg IV dexamethasone (n = 50), as study group or an equivalent volume of saline preoperatively, as control group. The anesthetic regimen and surgical procedures were standardized for all patients. The incidence of early and late vomiting, the time to first oral intake and duration of intravenous hydration were compared in both groups.

Results: Data analysis showed that the overall incidence of early and late vomiting was significantly lesser in dexamethasone group than the control one. The time to first oral intake and duration of IV therapy were also significantly shorter in dexamethasone group.

Conclusion: A single dose of dexamethasone significantly decreased the incidence of postoperative vomiting in early and late recovery phase and shortened the time to first oral intake and the duration of IV therapy.

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1. Introduction

Nausea and vomiting are common postoperative complications causing patients’ discomfort, delay in hospital discharge and seldom pulmonary aspiration. The incidence of postoperative emesis...
is higher in pediatrics population and increases with age to reach a peak in preadolescence (ages 11—14 years). This complication depends on the type of operation and is higher after strabismus surgery, tonsillectomy and orchiopexy in comparison with extremity or orthopedic surgeries [1].

Tonsillectomy with or without adenoidectomy is one of the most frequently performed surgical procedures in the world [2,3] and the incidence of postoperative nausea and vomiting has reported between 40% and 73% [4]. So prophylactic antiemetic therapy is recommended in these high risk patients and such drugs as metoclopramide and ondansetron have been used [5].

Dexamethasone was first reported as an antiemetic drug in patients undergoing chemotherapy [6]. Recently, prophylactic effect of this drug on postoperative nausea and vomiting has been showed in patients undergoing laparoscopy, tonsillectomy, gynecological and strabismus procedures [7—9]. Dexamethasone when used in single dose has little side effects and prolonged biologic life (36—48 h) [10]. Dexamethasone can reduce postoperative edema and improve the quality of oral intake after tonsillectomy by its anti-inflammatory effects [4]. However, many reports have challenged these effects [11—13].

This study was carried out to assess the effects of dexamethasone on postoperative nausea and vomiting in tonsillectomized patients and to some extent to clarify the above mentioned controversies.

2. Methods

After obtaining approval of Ethics Committee and written informed parental consent, 100 patients aged 5—15 years candidate for adenotonsillectomy were enrolled to this double-blind, placebo-controlled clinical trial performing in Matini Hospital of Kashan University of Medical Sciences (KAUMS), Kashan, Iran, 2005. Children with symptoms of common cold, those who had received psychoactive drugs, antiemetics, steroids and antihistamines were excluded from the study. Patients were not allowed solid food intake from the night before surgery, but clear liquids were permitted until 4 h before the operation. Intravenous cannula was inserted and standard patient monitoring was established. All patients received 30 ml/kg Ringer’s solution during the operation. They were randomly assigned to receive dexamethasone, 0.5 mg/kg IV and maximum dose of 8 mg, as study group (n = 50), and an equivalent volume of saline as control group (n = 50), in a double-blinded fashion. All patients received 0.002 mg/kg fentanyl 3 min before induction as a premedication, and anesthesia was induced with sodium thiopental 6 mg/kg and endotracheal intubation with cuffed tube of suitable size was facilitated by succinylcholine 1.5 mg/kg.

Anesthesia was maintained with O2/N2O mixture in 50% concentration and 0.5—1% halothane. The same surgeon performed all operations while patients were on spontaneous ventilation. At the end of the operation and before extubation, gastric contents of all patients was evacuated. After extubation and when sufficient ventilation was guaranteed, the patients were transferred to the postanesthesia care unit (PACU) and observed for 2 h and after stabilization of vital sings they were transferred to ward. Rectal acetaminophen 30 mg/kg was administered to all children every 6 h on demand. In the ward they were on cold liquid and soft diet regimen. Intravenous fluid infusion was continued until adequate oral intake (ingestion of 150 ml of fluids and 150 ml of soft food within 6 h). The incidence of vomiting was recorded during the 2 h of PACU stay (early vomiting) and from 2nd to 24th hours after surgery in the ward (late vomiting). Nausea was not recorded because it was difficult to assess in children and we did not use any antiemetic drugs.

Demographic data of the patients, the time to first oral intake, duration of IV therapy and duration of surgery were recorded. Data were analysed with Chi-square and t-tests.

3. Results

From 100 patients enrolled to the study, 50 received dexamethasone and 50 saline (placebo) intravenously. Demographic characteristics of patients and surgical procedures duration were not significantly different between the two groups (Table 1).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Group</th>
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<tr>
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<td>Dexamethasone (n = 50)</td>
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<tr>
<td>Age (year) (mean ± S.D.)</td>
<td>9.52 ± 3.2</td>
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<td>Sex (male/female)</td>
<td>26/24</td>
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<tr>
<td>Surgical duration (min) (mean ± S.D.)</td>
<td>18.96 ± 2.3</td>
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</tbody>
</table>
The incidence of early vomiting, first 2 h stay in PACU and late vomiting, 2nd to 24th hours stay in ward was significantly lower in dexamethasone group than placebo one. In addition, the time to the first oral intake and duration of IV hydration were significantly shorter in dexamethasone group than placebo (Table 2).

4. Discussion

The most important complications of tonsillectomy are pain, inadequate oral intake, vomiting, fever, dehydration and bleeding [1]. Vomiting causes patients’ discomfort, prolonged intravenous therapy and delayed discharge. To avoid it, in the first step anesthesiologist avoids potentially emetic drugs and tries to use drugs with antiemetic effects.

This study showed a decrease in incidence of postoperative vomiting in patients who received dexamethasone. This finding is shown in some other studies [1,3], but several others have failed to demonstrate any beneficial effect of dexamethasone on postoperative vomiting [11,14]. These studies had limited number of patients, and their anesthetic and antiemetic protocols were not standardized. Postoperative nausea and vomiting is a multifactorial problem and several anesthetic and non-anesthetic factors must be controlled to obtain meaningful results. In the present study, the sample size was large and perioperative factors capable to produce nausea and vomiting were omitted.

Dexamethasone may exert an antiemetic action through its prostaglandin antagonism [15], serotonin inhibition in the intestine [16] and release of endorphins [17].

Aouad et al. [1] and Pappas et al. [18] have showed a significant decrease in the incidence of vomiting in patients treated with dexamethasone during the first 24 h (delay recovery) but not in PACU phase (early recovery). Al-Shehri has also showed this findings [19]. We have not only found decreased vomiting during the delayed recovery phase but also in early (PACU) period and this may be due to potentiation of opioid analgesia by dexamethasone [4].

Like other investigations [14,4], our study showed that preoperative dexamethasone shortens the time to first oral intake and duration of IV therapy. These results may be attributed to anti-inflammatory effect of dexamethasone, which may reduce local edema and pain. Inconclusive results in other studies may be due to difficulties in standardizing preoperative clinical conditions, for example, Ohlms et al. [11], in their study had used 0.25 mg/kg of droperidol in both groups which can affect the results.

In conclusion, our study showed that use of dexamethasone, 0.5 mg/kg IV up to 8 mg, in patients undergoing adenotonsillectomy decreases the incidence of postoperative vomiting both in PACU and in ward (early and late vomitings). In addition, it shortens the time to first oral intake and duration of IV therapy without any reported side effects.

References


