

Dexamethasone Single Dose and Risk of Postoperative Nausea and Vomiting in Tonsillectomy Patients

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Abstract: Introduction: Several meta-analyses investigating morbidity following tonsillectomy have demonstrated that under controlled conditions a single intravenous dose of Dexamethasone (DX) is an effective, safe and inexpensive method of reducing the incidence of postoperative nausea and vomiting (PONV) following tonsillectomy in children¹⁻⁵. Unfortunately, there is substantial variability across these studies with respect to design, surgical technique, method of acquiring hemostasis and age of patients. We undertook the study to find out the effectiveness of a single IV dose of dexamethasone (0.15 mg/kg) on postoperative nausea and Vomiting (PONV) in tonsillectomy patients. Methods: This study was conducted with 100 patients who underwent tonsillectomy. Patients were divided into two groups of 50, where one group A (n=50) received preoperative dexamethasone and the other group B (n=50) were not given injection Dexamethasone. Postoperative nausea and vomiting (PONV) episodes of both groups were recorded in first 6 hours, then next 6-24 hours and of 24 hours. Inj. metoclopramide 0.15 mg/kg was administered as rescue antiemetic, if more than two episodes of vomiting in an hour or nausea lasting for more than half hour occurred. If PONV still persisted, inj. ondansetron 0.1 mg/kg was administered as rescue antiemetic. Results: There is significant decreased in the incidence of PONV in first 6 hours in group A who were given IV dexamethasone compared to control group B and same trend was seen in next 6- 24 postoperative hours and also after 24 hours. Conclusions: A single dose of preoperative intravenous dexamethasone significantly decreased the postoperative nausea and vomiting in tonsillectomy patients.

Keywords: Tonsillitis, Tonsillectomy, Pain relief, Dexamethasone, PONV- postoperative nausea and vomiting

1. Introduction

Several meta-analyses investigating morbidity following tonsillectomy have demonstrated that under controlled conditions a single intravenous dose of Dexamethasone (DX) is an effective, safe and inexpensive method of reducing the incidence of postoperative nausea and vomiting (PONV) following tonsillectomy in children¹⁻⁵. Unfortunately, there is substantial variability across these studies with respect to design, surgical technique, method of acquiring hemostasis and age of patients. Oropharyngeal pain and irritation of gastric mucosa by swallowed blood are two main contributors towards high incidence of PONV following tonsillectomy.

Steroids can have beneficial effects on post-tonsillectomy morbidity due to their anti-inflammatory and antiemetic properties. We undertook the study to find out the effectiveness of a single IV dose of dexamethasone (0.15 mg/kg) on postoperative nausea and Vomiting (PONV).

2. Materials and Methods

This was a prospective study conducted in Department of ENT and HNS of SKIMS Medical College and Hospital, Srinagar tertiary care hospital between January 2018 to March 2019. 100 patients were enrolled in this study and were randomly divided into two equal groups A and B of 50 patients each. The patients were explained about the study and the procedure involved and written and informed consent was taken. Ethical clearance for the study was obtained from the hospital ethical committee. Relevant clinical and demographic data were obtained from the

concerned patient. They also underwent detailed ENT examination.

Patients with coagulopathy, diabetes, gastritis, peptic ulcer, hypertension and cardiovascular or renal disease or on therapy with corticosteroids, anti-histaminic, or aspirin were excluded. Preoperatively tonsil size was graded into four grades:

- I – Tonsil within tonsillar fold
- II – Just outside the tonsillar fold
- III - Well outside the tonsillar fold
- IV – Reaching uvula or past uvula

Patients in group A (n=50) were administered intravenous dexamethasone (0.15 mg/kg) after the induction of anaesthesia. Group B patients (n=50) were not administered injection dexamethasone.

Episodes of postoperative Nausea and vomiting (PONV) in both groups i.e. Group A and Group B were recorded in first 6 hours, then next 6-24 hours and after 24 hours. Total number of episodes of vomiting for each patient were noted. Rescue antiemetic Inj. Metoclopramide 0.15mg/kg was given if more than two episodes of vomiting occurred in one hour or nausea lasting more than half hour occurred. If PONV still persisted, Inj. Ondansetron 0.1 mg/kg was given as rescue antiemetic.

3. Results

Each group comprised of 50 patients. Except for the age, all demographic characteristics including type of surgery and tonsil size were comparable for both groups (Table 1). Age was slightly higher in the cases group i.e. 9.58 ± 4.02 as

compared to control group 6.86 ± 3.3 (Table.1) The mean weight of cases group A was 23.86 ± 9.3 kg, as compared to control group B 30.75 ± 12.45 kg. (Table .1)

Table 1

Demographic Data		
Parameter	Control	Dexamethasone
Age	6.86 ± 3.3	9.58 ± 4.02
Weight (kg)	30.75 ± 12.45	23.86 ± 9.3
M/F (no of pts)	20/30	22/28
Surgery type (No of pts T/ T + A)	22/28	23/27
Tonsil size (No pts) I/II/III/IV	4/15/16/15	3/16/17/14

Age and weight are presented as mean \pm standard deviation T – tonsillectomy; T + A – tonsillectomy and adenoidectomy Incidence of nausea, vomiting and requirement of anti-emetic were significantly different for two groups.

Table 2

Postoperative nausea Vomiting (PONV)		
Parameter	Control	Dexamethasone
Nausea		
0-6 hours	16 (32%)	5 (10%)
6- 24 hours	9 (18%)	
Vomiting		
0-6 hours	15 (30%)	3 (6%)
6- 24 hours	9 (18%)	1 (2%)
0-24 hours	8 (16%)	1 (2%)
Patients with multiple episodes of vomiting	8 (16%)	2 (4%)
Total number of episodes of vomiting	28	13
Rescue analgesic		
0-6 hours	7 (14%)	1 (2%)
6- 24 hours	4 (8%)	1 (2%)

Data indicated as number of patients (% of patients)

Incidence of nausea in first 6 hours was significantly low in dexamethasone group (10%) compared to control group (32%). Similarly incidence of nausea in next 6- 24 hours was negligible in dexamethasone group (0%) compared to control group (28%). (Table. 2)

Incidence of Vomiting in first 6 hours was significantly low in dexamethasone group (6%) compared to control group (30%). Similarly incidence of vomiting in next 6- 24 hours was significantly low in dexamethasone group (2%) compared to control group (18%). After 24 hours same trend was present. (Table. 2)

Eight patients in control versus two in dexamethasone group had two or more episodes of vomiting (Table 2). Total number of vomiting episodes were significantly higher in control (28) compared to dexamethasone (13) group. (table.2)

The requirement of rescue antiemetic was significantly low in dexamethasone group (2%) compared to control group (14%) in first 6 hours and same trend was seen in next 6-24 hours. (Table 2)

4. Discussion

Common complications of tonsillectomy are postoperative nausea and vomiting (PONV), pain, and bleeding.⁶ Nonsteroidal anti-inflammatory drugs (NSAIDs) have been widely used in this setting for their pronounced analgesic efficacy and a lack of the emetogenic effect inherent to opioids. However, classic NSAIDs, through reversible platelet inhibition, further increase the risk of bleeding after tonsillectomy.^{7,8} Dexamethasone has antiemetic properties in the surgical setting.⁹ An international expert panel recommended dexamethasone, alone or as part of a multimodal regimen, for PONV prophylaxis in adults and children.¹⁰ It has been suggested that, especially in children undergoing tonsillectomy, dexamethasone is useful, not only for its antiemetic but also for its analgesic effects, and that it should be used routinely because the adverse effects and cost appear negligible.^{11,12,13,14} Indeed, dexamethasone for tonsillectomy has become standard care in many institutions.¹⁵ The dose response of dexamethasone for prevention of PONV symptoms in pediatric tonsillectomy remains unclear, although doses up to 1 mg/kg have been tested.^{16,17,18,19}

The 2008 guidelines of the Association of Paediatric Anaesthetists of Great Britain and Ireland conclude that in patients undergoing tonsillectomy, “dexamethasone 0.15 mg/kg provided good reduction in postoperative vomiting with no adverse effects.”²⁰ In our study, we also administered 0.15 mg/kg of I/V Dexamethasone to our patients. Expert panels have recommended the widespread use of dexamethasone in surgical patients.¹⁰ Prophylactic dexamethasone has become standard care in children undergoing tonsillectomy in many institutions.^{11,12,13} Several authors have suggested that dexamethasone should be given in considerably higher doses than what we tested.^{16,17,18,19} Our trial showed that dexamethasone significantly decreased the incidence of PONV in children undergoing tonsillectomy.

Karaman also found a dose-dependent decrease in PONV rates following administration of Dexamethasone.²¹ Steward et al²² did a meta-analysis of randomised double blind placebo controlled trials of a single dose of intravenous intraoperative steroid for paediatric patients who underwent tonsillectomy or adenotonsillectomy. Eight trials met their inclusion criteria. They concluded that routine use of steroids would prevent vomiting in one out of four children. In addition, would result in earlier soft or solid diet intake.

Our main aim was to find out the effect of steroid on pain following tonsillectomy. We selected dexamethasone as it is highly potent and has long half-life (36-72 hours) for glucocorticoid activity, so that the effect would remain even after the discharge of the patient. Single IV dose was used, as it is devoid of side effects like gastritis, adrenal suppression etc.²³ IV drug was given before surgery to achieve peak effect in the early postoperative period.

5. Conclusion

We conclude that, a single IV dose of 0.15 mg/kg dexamethasone, given following induction of anaesthesia, provided good and prolonged antiemetic effect and resulted in earlier and better quality of oral intake without side effects.

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