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Low dose Vs High dose Dexamethasone and Vomiting, Pain and Time to first liquid intake following Tonsillectomy in Pediatric patients

KEYWORDS: tonsillectomy, dexamethasone, post operative morbidity, pediatric

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ABSTRACT ***Background-*** *Tonsillectomy is associated with significant vomiting, pain and delayed time to first liquid intake in post-operative period in pediatric patients.*

Research question- *Using dexamethasone pre-operatively in children might result in reducing vomiting, pain and time to first liquid intake.*

Material & methods *- Study design: Quasi-randomized controlled trial. Study sample: 30 pediatric patients in whom tonsillectomy was planned; 15 in each group. Study settings: Tertiary health care setup i.e. pediatric patients coming to Medical College for treatment Allocation: Alternatively the patients were assigned to the High dose and Low dose dexamethasone group.*

Consent: *Written consent from the Parents/Guardian. Statistical analysis: chi-square test for qualitative parameters, t-test for quantitative parameters*

Results *– high dose of dexamethasone though slightly improves the post-operative morbidities but the difference was not significant.*

Introduction

Tonsillectomy is one of the most frequently performed surgical procedures all over the word. Despite the evolution of anesthetic and surgical techniques available, post-tonsillectomy morbidity remains a significant clinical problem not only for the patient, but the family and physician as well. Tonsillectomy is associated with significant vomiting, pain and delayed time to first liquid intake in post-operative period in pediatric patients. Methods for reducing pain, nausea, and vomiting after tonsillectomy are important to improve the standard of care our patients receive. During the past 35 yrs, investigators have studied the effects of systemic corticosteroids in reducing post-tonsillectomy morbidity because significant edema and inflammation occur in the operative bed. Steroid medications nonspecifically reduce inflammation, and so it follows that peri-operative steroid administration might be useful in decreasing postoperative symptoms in patients undergoing tonsillectomy.[1] Unfortunately, there is no agreement regarding the routine use of corticosteroids in tonsillectomy. So we planned to compare the effects of low dose & high dose of dexamethasone on vomiting, pain & time to first liquid intake following tonsillectomy in pediatric patients.

Methodology-

The study was a prospective, quasi-randomized, double blind, controlled trial, carried out in 40 pediatric patients undergoing elective tonsillectomy with or without adenoidectomy; under general anaesthesia, in a tertiary health care setup of Govt. Medical College Khanpur Kalan, Sonipat, Haryana. Patients were divided into two groups, each consisting of 20 Patients. Alternatively the patients were assigned to the High dose and Low dose dexamethasone group. Similar surgical technique/dissection method (homeostasis was achieved using packs or sutures; Electrocautery only to treat persistently active bleeding sites) were used. Similar anaesthetic protocol was followed for all the study subjects i.e. for premedication glycopyrrolate and midazolam, for induction thiopentone 5mg/kg and rocuronium 0.3-0.6 mg/kg and for maintenance sevoflurane with oxygen was used. Post-operative analgesia was provided with tramadol and Fentanyl. Each subject was given the study medication 30 mins after induction. One group received a single intra-operative dose of 0.5mg-1 mg/kg dexamethasone 30 minutes after intubation and other Group received 0.05mg/kg dexamethasone 30 minutes after intubation. Patients were monitored for post-operative care for 3 hrs and in the ward for next to 24 hrs for nausea/vomiting. Pain was assessed using ten-point scale (0-10), where 0=no pain and 10=intolerable pain. Pain was assessed hourly for first two hrs and two hrly for next four hrs and afterwards daily analgesic use was recorded. Oral fluids advised after 6 hours of surgery and acceptance of oral fluids recorded. Quality of oral intake will be graded as excellent if patient requested it, good if patients accepted it when offered and fair if patients accepted it when coaxed and poor when patient refused. Study was a double blind study. The patients and the person performing the analysis were not aware about the group. Written consent from the Parents/Guardian. Statistical analysis was performed by applying chi-square test for qualitative parameters and t-test for quantitative parameters by using SPSS version 14.0.

Results-

The study subjects were comparable as far as age and sex distribution was concerned (as shown in table 1). Similar proportion of the subjects perceived nausea/vomiting in high dose group when compared with low dose group (table 2). Also the pain score, time to solid and liquid intake were similar as no statistical difference was seen in these parameters by applying t test (table 3). Moreover the rescue doses of analgesia were required in similar proportions in both the groups (table 4).

Table 1: Age & Sex wise distribution of study subjects (N=40)

		High dose group	Low dose group	Total
Age (in years)	>5 years	5 (25%)	4 (20%)	9 (22.5%)
	5-10 years	10 (50%)	9 (45%)	19 (47.5%)
	8-14 years	5 (25%)	7 (35%)	12 (30%)
Sex	Male	11 (55%)	12 (60%)	23 (57.5%)
	Female	9 (45%)	8 (40%)	17 (42.5%)
Total		20 (100%)	20 (100%)	40 (100%)

Table 2: Post-operative Nausea/Vomiting among different group of study subjects (N=40)

Post operative Nausea / Vomiting		High dose group	Low dose group	Total
> 6hours	Present	7 (35%)	6 (30%)	13 (32.5%)
	Absent	13 (65%)	14 (70%)	27 (67.5%)
6-24 hours	Present	3 (15%)	2 (10%)	5 (12.5%)
	Absent	17 (85%)	18 (90%)	35 (87.5%)

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Table 3: Pain Score & time to solid/liquid intake among different group of study subjects (N=40)

Parameter	High dose group Mean ± SD	Low dose group Mean ± SD	T test value	P value
Pain score	5.15±1.09	5.25±1.21	-0.275	0.785
Time to 1st liquid intake	6.05±0.99	6.00±1.41	0.129	0.898
Time to 1st solid intake	8.40±1,46	8.50±1,35	-0.224	0.824

Table 4: Additional analgesia among different group of study subjects (N=40)

Additional rescue analgesia required in 24 hours	High dose group	Low dose group
Required	2 (10%)	3 (15%)
Not-required	18 (90%)	17 (85%)
Chi-square value	0.229	
P-value	0.633	

Discussion-

The results of the present study indicate that of dexamethasone though reduced morbidity after tonsillectomy but not significantly. Several studies have evaluated the effects of dexamethasone on PONV and pain after paediatric tonsillectomy. The onset of dexamethasone is thought to be 1–2 h allowing time to diffuse across the cell membrane and alter gene transcription. Administration of steroids 60 min or more before surgical trauma may be important in minimizing pain and inflammation Similarly, dexamethasone is a more effective antiemetic when given before induction of anaesthesia than at the end of surgery.[1]

Other researchers however had shown that single dose of dexamethasone given at the induction of anaesthesia reduced the incidence of early and late PONV and improved pain scores on the second postoperative day.[2-6] They often included a limited number of patients and/or did not use standardized anaesthetic techniques and rescue treatment protocols. In addition, the results of the few randomized placebo-controlled studies that evaluated the effects of a single i.v. corticosteroid administration are conflicting, in that some studies showed a beneficial effect, while others did not.[7-10]

In meta-analysis done by Waldron etal, patients treated with dexamethasone experienced less postoperative pain, required less postoperative opioids, had longer time to first analgesic dose, needed less rescue analgesia, and had shorter PACU stays.[1]

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