

Original Research Article

Efficacy of single dose preoperative intravenous dexamethasone for postoperative pain relief in tonsillectomy patients

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Received: 25 December 2016

Revised: 15 February 2017

Accepted: 16 February 2017

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ABSTRACT

Background: Tonsillectomy is one of the most commonly performed surgical procedures in otolaryngology. For managing post tonsillectomy pain, different modalities like use of intravenous opioids, NSAIDs, local anaesthetics, nerve blocks and steroids are available. The aim of this study is to determine the efficacy of single dose preoperative intravenous dexamethasone for postoperative pain relief in patients undergoing tonsillectomy.

Methods: This study was conducted with 120 patients who underwent tonsillectomy. Patients were divided into two groups of 60, where one group received preoperative dexamethasone. Postoperative pains of both groups were assessed.

Results: There is significant difference in pain in both the groups in 6th and 12th postoperative hours, but in 2nd hour there is no significant difference.

Conclusions: A single dose of preoperative intravenous dexamethasone significantly decreased the postoperative pain in tonsillectomy patients.

Keywords: Tonsillitis, Tonsillectomy, Pain relief, Dexamethasone

INTRODUCTION

Tonsillectomy is one of the most frequent surgical procedures carried out in children who are commonly associated with increased risk of certain complications such as throat pain, referred otalgia, poor oral intake and haemorrhage. Post tonsillectomy pain is probably the result of muscle spasm caused by inflammation and irritation of the pharyngeal musculature.^{1,2}

After surgery patients usually have considerable odynophagia, change of diet and decreased activities. The recovery period of children usually lasts 4 days to a week, while adults may remain symptomatic up to 2 weeks. The odynophagia can be severe enough to limit oral intake that on occasion patients may become dehydrated requiring admission for intravenous fluids.^{3,4}

Steroids can have beneficial effects on post-tonsillectomy morbidity due to their anti-inflammatory and antiemetic properties. The most measured steroid for this purpose is dexamethasone, which is inexpensive and largely devoid of side effects. Steroids are believed to act to reduce tissue damage and postoperative pain by suppressing fibrin deposition, capillary dilation, edema formation and leucocyte migration. Steroids are believed to increase thirst and appetite, result in a more rapid return to regular diet and adequate fluid intake.⁵⁻⁷

Local infiltration of steroids and oral 4 day course of steroids have shown promising results in tonsillectomy patients.^{8,9} However, the literature regarding the use of intravenous corticosteroids for tonsillectomy is conflicting.¹⁰⁻¹² There are controversies about the type and dose of the corticosteroid, whether to use single or

multiple doses and whether to use alone or as adjuvant to other drugs. Our aim was to find the efficacy of single dose preoperative intravenous dexamethasone for post-operative pain relief in patients undergoing tonsillectomy.

METHODS

This was a cross sectional study conducted in a tertiary care hospital between May 2015 to April 2016. 120 patients were enrolled in this study and were randomly divided into two equal groups. Patients in group A (n=60) were administered intravenous dexamethasone (0.15 mg/kg) after the induction of anaesthesia. Group B patients (n=60) were not administered injection dexamethasone in addition to other drugs.

Postoperatively, the pain was assessed in both the groups at 2, 6 and 12 hours using objective pain scale (OPS) in children less than 8 years and visual analogue scale (VPS) in those above 8 years.



Figure.1. Visual analogue scale

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.

Statistical analysis

Categorical data are expressed in frequencies or percentages. Normality assumption was assessed using

Kolmogorov Smirnov test. Continuous data are expressed in terms median and interquartile range for non-normal data. Mann-Whitney U test was used to compare two groups. P < 0.05 was considered significant.

Table 1: Objective pain scale.

Observation	Criteria	Points
Blood Pressure	+/- 10 % of preoperative	0
	>20% of preoperative	1
	>30% of preoperative	2
Crying	Not crying	0
	Crying but responding to tender loving care	1
	Crying and not responding to tender loving care	2
Movement	None	0
	Restless	1
	Thrashing	2
Agitation	Patient asleep and calm	0
	Mild	1
	Hysterical	2
Verbalises pain	Asleep or no verbalization of pain	0
	Cannot localize pain	1
	Localizes pain	2

From Kolmogorov Smirnov test, data did not follow normality assumption, hence non parametric test was used and continues data was expressed in median and inter quartile range.

RESULTS

Each group comprised of 60 patients. Median age of 120 patients was 9 (6-12). The values obtained from OPS and VPS were tabulated and compared.

As seen in the Table 3 there is significant difference in pain score at 6th and 12th hour between both the groups, but there is no significant difference in 2nd hour.

Table 2: Demographic data.

	DEXA			
	No		Yes	
	Median	Inter quartile range	Median	Inter quartile range
Age	9	6- 12	9.5	6.5 – 13
Gender				
M	39	65%	39	65%
F	21	35%	21	35%

Table 3: Comparison of pain score at different time intervals between the groups.

Pain score at different time intervals after surgery	DEXA				P-value
	No		Yes		
	Median	Inter quartile range	Median	Inter quartile range	
After 2nd hour	8	8- 9	8	8- 8	0.137
6th hour	6	6- 7	5	4 - 5	<0.001*
12th hour	4	4- 5	3	3- 3	<0.001*

*indicates statistically significant

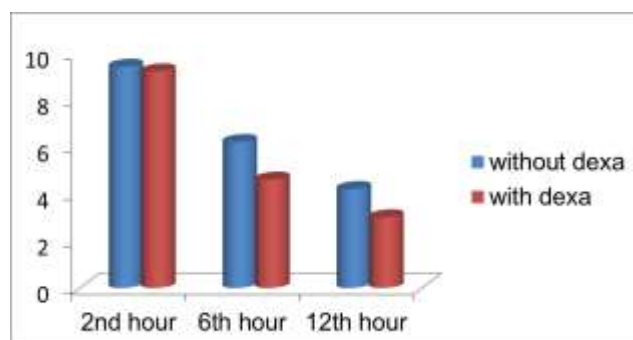


Figure 1: Combined Visual Analogue Scale and Objective Pain Scale score of 120 patients.

DISCUSSION

Postoperative pain, nausea and vomiting remain a significant problem for children undergoing tonsillectomy, and are the commonest reason for readmission after procedure. Much discomfort after tonsillectomy is potentially due to local inflammation, edema and nerve irritation. It has been shown that in patients with a high risk of postoperative nausea and vomiting, a single prophylactic dose of dexamethasone can be effective compared to placebo, without evidence of any clinically relevant toxicity.^{13,14} Dexamethasone is one of the most potent glucocorticoids available that can effectively suppress a basic inflammatory response to tissue injury.^{15,16} Dexamethasone has been identified as a strong anti-inflammatory glucocorticoid, which also has antinociceptive influences by inhibiting glial activation, sympathetic sprouting, production of leukotrienes, tumor necrosis factor- α and other mediators of inflammatory hyperalgesia and central sensitization.^{17,18}

In a study done by Vosdoganis et al, the effect of intravenous dexamethasone on postoperative vomiting and pain was studied. Dexamethasone decreased incidence of vomiting while no significant difference was found between the dexamethasone and placebo groups in the time to first intake of fluids, pain scores or analgesic requirement postoperatively.¹⁹

Hermans et al in their study concluded that the incidence of significant pain did not differ between dexamethasone groups and the placebo group, however, on postoperative day 2, the incidence of significant pain was significantly

lower in the groups using dexamethasone. They used visual analogue scale for pain evaluation.²⁰

Buland et al and Hashmi et al, in their studies concluded that single dose intravenous injection of dexamethasone relieved post-tonsillectomy pain significantly.¹⁻³

These studies were done on 60 and 100 patients respectively. In our study we have taken 120 patients and the results were similar.

Giannoni et al and Lachance et al in their studies concluded dexamethasone failed to decrease postoperative pain.^{21,22}

In our study, 120 patients were included who underwent tonsillectomy. 60 patients received preoperative intravenous dexamethasone and other 60 patients were not given dexamethasone. Patients who received dexamethasone had significant reduction in post-operative pain.

CONCLUSIONS

This study shows that, a single dose of preoperative intravenous dexamethasone significantly decreased the postoperative pain in tonsillectomy patients. There is significant difference in pain score at 6th and 12th hour between both the groups, but there is no significant difference in 2nd hour. Single preoperative dose administration of dexamethasone carries no significant adverse effects and hence can be safely given

ACKNOWLEDGMENTS

Our gratitude to Miss. Megha Nair for prompt statistical analysis of data.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Lakhan MS, Ramlan S, Somayaji G. Efficacy of single dose preoperative intravenous dexamethasone for postoperative pain relief in tonsillectomy patients. *Int J Otorhinolaryngol Head Neck Surg* 2017;3:323-6.