

# Dose of Dexamethasone for the Prevention of Post-Tonsillectomy, Nausea and Vomiting: Does it work?

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## ABSTRACT

**Objective:** To compare the post-tonsillectomy nausea and vomiting with and without a single intra-operative intravenous dose of dexamethasone 0.5mg/kg.

**Study Design:** Randomized controlled trial

**Place and Duration of Study:** This study was conducted at the Department of ENT, Sir Ganga Ram Hospital Lahore from August 2018 to August 2019.

**Materials and Methods:** One hundred and forty patients were equally divided into two groups. Group I was treated with dexamethasone 0.5mg/kg and Group II was treated without dexamethasone. Complete laboratory examination was done. Tonsillectomy was performed by sharp dissection snare technique in all the patients by the same surgeon. Post-operatively 8-hourly Amoxicillin/clavulanic acid 15mg/kg orally, paracetamol 15 mg/kg and povidone iodine mouth wash were given to all the patients.

**Results:** The mean age in Group I was 12.37±5.84 and in Group II it was 10.82±4.37 year. There were 34 (48.6%) males in group I and 36 (51.4%) males in group II, while females were 36 (51.4%) in group I and 34 (48.6%) in group II. Postoperative nausea and vomiting was observed in 5 patients (7.1%) of group I and 19 patients (27.1%) of group II (p=0.002). Mean duration of disease was 3.87±1.21 and 2.96±0.98 year in group I and II, respectively (Table-4). Mean BMI in group I was 17.96±2.68 and in group II 17.47±0.98 (kg/m<sup>2</sup>).

**Conclusion:** Single intravenous dose of dexamethasone 0.5mg/kg intra-operatively is safe and effective for the prevention of post-operative complications such as nausea and vomiting in patients undergoing tonsillectomy.

**Key words:** Tonsillectomy, Dexamethasone, Nausea, Vomiting

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## INTRODUCTION

Tonsillectomy is one of the most commonly performed surgical procedures throughout the world.<sup>1</sup> Tonsillectomy is also the most common ENT surgery performed under general anaesthesia. Nausea, vomiting, pain and bleeding are the most commonly occurred complications after tonsillectomy.<sup>2</sup>

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Most of the patients undergoing tonsillectomy are children and the frequent incidence of severe pain and vomiting in the early postoperative period can delay oral intake and lead to increased risk of dehydration. In this high-risk group, therefore, some form of prophylactic therapy is recommended. Glucocorticoids, such as dexamethasone and methylprednisolone, have anti-inflammatory and antiemetic properties with dexamethasone being commonly used.<sup>3</sup>

Tonsillectomy is performed almost exclusively as a day case operation in eligible patients in many institutions.<sup>4</sup> While nausea and vomiting is considered a minor postoperative complication, it can have serious implications in short-stay and day-care operations such as tonsillectomy. PONV can be very distressing, leading to bleeding, malnutrition, electrolytes and acid-base imbalance. Persistent retching and vomiting may affect the outcome of various surgical procedures and may increase the risk of vomiting induced pulmonary aspiration. It also increases the stay in the post-anaesthesia care unit (PACU), delays the discharge and results in increased hospital admission rate. Postoperative nausea and vomiting (PONV) may occur in 40% to 73% of patients.<sup>5</sup> Another study showed that

nearly 50% of children experience postoperative nausea or vomiting without antiemetic prophylaxis.<sup>4,6</sup> Post-operative nausea and vomiting are directly associated with many of severe problems such as trigeminal nerve stimulation, irritation of gastrointestinal tract, diathermy use, opiate administration during anaesthesia and obesity.<sup>7</sup>

More studies show that at least one third of PONV patients experience a diminished quality of life over the first 5 days of recovery.<sup>8</sup> Parents whose children experience pain and nausea after surgery frequently say that PONV is the most troubling symptom, suggesting that PONV causes more discomfort and anxiety than pain in some patients. With prophylaxis and Proper treatment, incidence of PONV and pain can be reduced.<sup>9</sup> Dexamethasone has been used in various operations to reduce postoperative pain and PONV.

Dexamethasone has recently been used as prophylaxis for postoperative nausea and vomiting in children undergoing tonsillectomy.<sup>10</sup> The exact mechanism of action of dexamethasone is not understood, but its antiemetic activity is believed to be due to the antagonism of prostaglandins effects.<sup>11</sup> It is demonstrated by many of studies that use of single intravenous dose of dexamethasone may helps to reduce the incidence rate of post-operative nausea and vomiting in children undergoing tonsillectomy.<sup>12</sup>

A wide variation in the reported incidence of nausea and vomiting in patients after tonsillectomy in different geographical areas was observed. The geographic origin of the patients could be an important factor in determining the incidence of nausea and vomiting in tonsillectomy patients as well as their response to prophylaxis. This study is designed to examine the efficacy of single intravenous dose of dexamethasone for prevention of post tonsillectomy nausea and vomiting at our setting.

## MATERIALS AND METHODS

This randomized controlled trial study was carried out at Department of ENT; Sir Ganga Ram Hospital Lahore from 23<sup>rd</sup> August 2018 to 22<sup>nd</sup> August 2019. A total of 140 patients (70 patients in each group) were taken. Group I treated with dexamethasone 0.5mg/kg and Group II was treated without dexamethasone. Patients age between 6-30 years, both genders male and female, chronic tonsillitis and enlarged tonsils causing difficulty in swallowing, breathing or speech were included. Those patients with history of upper respiratory tract infection within last three weeks, history of taking steroids or anti-emetics 24 hours preoperatively and known contraindication to steroids were excluded. Patients were informed about inclusion in study, medicine to be given, benefits and risks involved. Complete laboratory examination was done in all the patients such as CBC, bleeding time, clotting time, PT, APTT and hepatitis screening. Patients in group I

received dexamethasone 0.5mg/kg diluted in 5 ml normal saline while patients in group II received nothing. The standard anaesthesia protocol was followed in all the patients. Single dose (0.5mg/kg) of dexamethasone was administered after the induction of anaesthesia in group I patients. Tonsillectomy was performed by sharp dissection snare technique in all the patients by the same surgeon. Post-operatively 8-hourly Amoxicillin/ clavulanic acid 15mg/kg orally, paracetamol 15 mg/kg and povidone iodine mouth wash were given to all the patients. Patients were monitored for postoperative nausea, vomiting and the need for rescue anti-emetics during first 24 hours in the ward. Nausea was assessed on verbal rating scale from zero to 10 and was labelled if score was  $\geq 5$ . One or more episodes of vomiting in 24 hours was confirmatory. Presence of either nausea or vomiting was regarded as PONV. The collected data was analyzed by using SPSS version 20. Chi-square test was applied to compare the difference of post-operative nausea and vomiting with p-value  $< .05$  was taken as significant.

## RESULTS

Mean age of the patients was  $12.37 \pm 5.84$  and  $10.82 \pm 4.37$  year in group I and group II, respectively. There were 34 (48.6%) males in group I and 36 (51.4%) males in group II, while females were 36 (51.4%) in group I and 34 (48.6%) in group II (Table 1).

**Table No.1: Demographic information of the patients**

Variable	Group I		Group II	
	No.	%	No.	%
<b>Age (years)</b>				
< 20	62	88.6	68	97.2
21-30	8	11.4	2	02.8
<b>Gender</b>				
Male	34	48.6	36	51.4
Female	36	51.4	34	48.6

**Table No.2: Frequency of PONV in both groups**

PONV	Group I		Group II	
	No.	%	No.	%
Yes	05	07.1	19	27.1
No	65	92.9	51	72.9

Chi square=9.856 P value=0.002

**Table No.3: Distribution of patients by duration of disease**

Duration of disease(year)	Group I		Group II	
	No.	%	No.	%
$\leq 5$	63	90.0	70	100.0
$> 5$	07	10.0	-	-
<b>Mean<math>\pm</math>SD</b>	<b>3.87<math>\pm</math>1.21</b>		<b>2.96<math>\pm</math>0.98</b>	

Postoperative nausea and vomiting was observed in 5 patients (7.1%) of group I and 19 patients (27.1%) of group II (p=0.002)(Table 2). Mean duration of disease

was  $3.87 \pm 1.21$  and  $2.96 \pm 0.98$  year in group I and B, respectively (Table 3). Mean BMI in group I was  $17.96 \pm 2.68$  and in group II  $17.47 \pm 0.98$  ( $\text{kg}/\text{m}^2$ ) (Table 4).

**Table No.4: BMI wise distribution**

BMI ( $\text{kg}/\text{m}^2$ )	Group I		Group II	
	No.	%	No.	%
$\leq 20$	54	77.2	60	85.7
$> 20.1$	16	22.8	10	14.3
<b>Mean<math>\pm</math>SD</b>	<b>17.96<math>\pm</math>2.68</b>		<b>17.47<math>\pm</math>0.98</b>	

## DISCUSSION

Post operative nausea and vomiting (PONV) is a common complication of tonsillectomy in the postoperative period and is observed in 15% to 80% of patients following tonsillectomy.<sup>13,14</sup> Postoperative pain and vomiting can contribute to dehydration, and together these three symptoms are responsible for 70% of unplanned hospital returns. Managing these effects is the key to tonsillectomy's overall success.<sup>14</sup> Several studies have suggested that steroids can have beneficial effects on post-tonsillectomy nausea and vomiting due to their anti-emetic and anti-inflammatory properties.

Intravenous (IV) corticosteroids have been shown to be effective in reducing vomiting and improving postoperative analgesia and dietary restart at 24 hours. The most commonly used steroid for this purpose is dexamethasone (DEX) which is cheap and without major side-effects.<sup>15,16</sup>

In our study, postoperative nausea and vomiting was observed in 7.1% patients who received a single intravenous dose of dexamethasone (Group A) and 27.1% patients who did not receive dexamethasone (Group B) ( $p=0.002$ ). These results are in line with a local study by Khan et al<sup>2</sup> who reported post operative nausea and vomiting in 10% of patients using 0.5mg/kg dexamethasone for tonsillectomy and 46% of patients without dexamethasone ( $p=0.006$ , 0.014 for nausea and vomiting respectively). Similarly Hashmi et al<sup>5</sup> reported PONV in 16% and 46% respectively in patients who received a single dose of dexamethasone (0.5mg/kg) and who did not receive dexamethasone ( $p < 0.05$ ).

Internationally our results are comparable to those reported by Czarnetzki<sup>13</sup> who reported PONV in 12% and 44% respectively in patients who received dexamethasone 0.5 mg/kg and who did not receive dexamethasone ( $p=0.001$ ). Similarly Hermans et al<sup>16</sup> reported PONV in 22% patients who received single intravenous dose of dexamethasone (0.5mg/kg) and in 49% patients who did not receive dexamethasone ( $p=0.001$ ).

Locally Muhammad et al<sup>17</sup> reported that PONV was experienced by 26% patients receiving dexamethasone and 62% patients who did not receive dexamethasone

( $p=0.02$ ). Although these figures are higher than ours but still in line with our results.

In our study patients experiencing PONV in both groups are significantly less than a study by Pappas et al who showed decrease in frequency of PONV from 88% to 48% using dexamethasone for tonsillectomy ( $p < 0.05$ ).<sup>18</sup> This difference in numbers could be due to the fact that we used cold dissection method whereas Pappas et al used electro-dissection technique for tonsillectomy. It has been reported in literature that electro-dissection technique for tonsillectomy is associated with higher incidence of PONV as compared to cold dissection technique.<sup>19</sup>

On the other hand no significant difference was found in the frequency of nausea and vomiting across groups receiving or not receiving dexamethasone in two studies by Malde et al<sup>20</sup> and Stewary et al.<sup>21</sup> This difference in results probably resulted from the fact that relatively lower doses of dexamethasone were used in these two studies.

## CONCLUSION

Tonsillectomy is the most performing surgical treatment and post-operative complications such as nausea and vomiting are the most frequent complication which can cause serious morbidity. We concluded that single intravenous dose of dexamethasone 0.5mg/kg intra-operatively is safe and effective for the prevention of post-operative complications such as nausea and vomiting in patients undergoing tonsillectomy.

### Author's Contribution:

Concept & Design of Study:	Faisal Rafiq
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**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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