



Determination of optimum dosage of intraoperative single dose dexamethasone in pediatric tonsillectomy and adenotonsillectomy

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ABSTRACT

Objective: Our objective is to determine the optimum dosage of intraoperative single dose dexamethasone and its effect upon postoperative morbidity in pediatric tonsillectomy and adenotonsillectomy patients.

Study design and methods: Totally 150 pediatric patients whom underwent adenotonsillectomy or tonsillectomy surgery are offered to participate in this study at otorhinolaryngology clinic between 2002 and 2003. 150 patients are divided into three randomized groups, each composed of fifty patients. Anesthesia protocol is standardized in each group and 0.2 mg/kg intraoperative dexamethasone is given to first group, 0.7 mg/kg (maximum dose 25 mg) intraoperative dexamethasone is given to second group and third group is accepted as control group without giving any intravenous dexamethasone. Each group is compared for postoperative nausea, vomiting and tolerability to take oral foods within first 24 h with the same questionnaire.

Results: There is significantly higher ratio of postoperative nausea and vomiting within first 24 h in group III (80%) when compared with group I (8%) ($p: 0.001$; $p < 0.01$) and group II (4%) ($p: 0.001$; $p < 0.01$). Also there is significantly higher ratio of patient's tolerability to take oral semisolid/solid foods within postoperative first 24 h in group II (94%) when compared with group I (58%) ($p: 0.001$; $p < 0.01$) and group III (12%) ($p: 0.001$; $p < 0.01$). We didn't encounter any side effect of dexamethasone in group I and II.

Conclusions: We thought that 0.7 mg/kg dosage of IV dexamethasone is much a preferable choice depending of its effectiveness on decreasing postoperative morbidity rather than 0.2 mg/kg dosage and beside to this advantage we didn't encounter any side effects.

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1. Introduction

Tonsillectomy is one of the most common surgical procedure in worldwide. Posttonsillectomy morbidity especially nausea, vomiting and delay on taking oral foods is still a clinical problem even developments in surgical and anasthetical techniques [1]. There are many studies in literature about decreasing postadenotonsillectomy morbidity of patients. Literature studies showed that intraoperative intravenous (IV) dexamethasone obviously decreases posttonsillectomy morbidity [2–6]. But there is no

consensus about optimum dosage of intravenous dexamethasone in literature. Intraoperative dexamethasone dosage in literature studies changes between 0.15 mg/kg and 1 mg/kg [7].

In this clinical study we aimed to determine the optimum dosage of intraoperative single dose dexamethasone and its effect upon postoperative morbidity in pediatric tonsillectomy and adenotonsillectomy patients.

2. Materials and methods

We carried out a prospective, single-blinded, randomized comparative study to examine the efficacy of intraoperative single dose dexamethasone. Totally 150 pediatric patients whom underwent adenotonsillectomy or tonsillectomy are offered to participate in this study at otorhinolaryngology clinic of Bezm-i Alem Vakıf Gureba State Hospital for Research and Training between 2002 and 2003. 150 patients are divided into three randomized groups, each composed of fifty patients equally.

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Randomization was done by manually selecting the random samples. We used individual randomization rather than block randomization. 68 patient was male (45.3%) and 82 patient was female (54.7%). The mean age of the patients was 5.88 ± 1.50 (range 3–11) years. Anesthesia protocol is standardized in each group and 0.2 mg/kg intraoperative dexamethasone is given to first group, 0.7 mg/kg (maximum dose 25 mg) intraoperative dexamethasone is given to second group and third group is accepted as control group without giving any intravenous dexamethasone. Each group is compared for postoperative nausea, vomiting and tolerability to take oral foods within first 24 h with the same questionnaire. All 150 patients are observed in hospital for 24 h.

Patients are questioned about vomiting, regurgitation, drug usage, motion sickness and any gastrointestinal disease history preoperatively. Patients with these conditions are excluded from study. Patients didn't take any premedication preoperatively. Anesthesia protocol is standardized as 0.5 mg/kg rocuronium during intubation and continued with sevoflourane and nitrous oxide.

SPSS (Statistical Package for Social Sciences) for Windows 15.0 program is used for statistical analysis of the results in this study. Data values are expressed as mean, standard deviation, frequency and percentage. For the qualitative data comparison Chi-square test is used. Differences were considered significant when $p < 0.05$.

3. Results

A dosage of 0.2 mg/kg intraoperative dexamethasone is given to group I patients and four (8%) of the fifty patients showed nausea and vomiting postoperatively. In group II patients 0.7 mg/kg dose of intraoperative dexamethasone is given and only two (4%) of fifty patients showed nausea and vomiting. 40 patients (80%) of control group showed nausea and vomiting. When comparing about tolerability to start taking oral foods within first 24 h, 29 patients in group I, 47 patients in group II and only 6 patients in control group could start to take semisolid/solid oral foods (Tables 1 and 2).

There is a statistically significant difference between groups when comparing about postoperative nausea and vomiting in first 24 h ($p < 0.01$). There is a significantly higher ratio of postoperative nausea and vomiting within first 24 h in group III (80%) when compared with group I (8%) ($p: 0.001$; $p < 0.01$) and group II (4%)

($p: 0.001$; $p < 0.01$). There is no statistically significant difference about postoperative nausea and vomiting in first 24 h between group I and II ($p: 0.400$; $p > 0.05$) (Table 1).

Also there is a statistically significant difference between groups when comparing patient's tolerability to take oral semisolid/solid foods within postoperative first 24 h ($p < 0.01$). There is significantly higher ratio of patient's tolerability to take oral semisolid/solid foods within postoperative first 24 h in group II (94%) when compared with group I (58%) ($p: 0.001$; $p < 0.01$) and group III (12%) ($p: 0.001$; $p < 0.01$). There is significantly higher ratio of patient's tolerability to take oral semisolid/solid foods within postoperative first 24 h in group I (94%) when compared with group III (12%) ($p: 0.001$; $p < 0.01$) (Table 2).

We didn't encounter any side effect of dexamethasone in group I and II.

4. Discussion

Otorhinolaryngologists studied about the effects of systemic corticosteroids upon posttonsillectomy morbidity within last 30 or 35 years [8]. But there is still no consensus about the usage of corticosteroids routinely [9].

Posttonsillectomy morbidity especially nausea, vomiting and delay on taking oral semisolid/solid foods is still a clinical problem [7]. Steward et al. found incidence of postadenotonsillectomy nausea and vomiting about 70% [10]. Vomiting causes distress, anxiety, dehydration and metabolic disturbances and as a result of these conditions prolonged hospitalization [3]. Fuji et al. studied about the effects of dexamethasone in posttonsillectomy patients comparing with placebo and found that dexamethasone significantly decreased vomiting in posttonsillectomy patients [11].

A mechanism of the antiemetic effect of dexamethasone is still unknown [12]. The Italian Group of Antiemetic Research [13] and Hesketh P. et al. [14] studied about the antiemetic effect of dexamethasone in patients who has taken chemotherapy and found dexamethasone as a highly effective antiemetic. It is known that postoperative beneficial effect of dexamethasone persists about three days because biological half life of dexamethasone is about 36–72 h [15].

Steward et al. stated that they are using IV single dose dexamethasone for about 10 years and they didn't encounter any

Table 1

Distribution of patients who had postoperative nausea and vomiting within postoperative 24 h.

	Group I (0.2 mg/kg I.V. Dexamethasone) n (%)	Group II (0.7 mg/kg I.V. Dexamethasone) n (%)	Group III (no I.V. Dexamethasone) n (%)	p
Positive Nausea and Vomiting	4 (%8.0)	2 (%4.0)	40 (%80.0)	0.001**
Negative Within First 24 h	6 (%92.0)	48 (%96.0)	10 (%20.0)	

Chi-square test is used.

** $p < 0.01$.

Table 2

Distribution of patients who were tolerable to take semisolid/solid oral food within postoperative 24 h.

	Group I (0.2 mg/kg I.V Dexamethasone) n (%)	Group II (0.7 mg/kg I.V Dexamethasone) n (%)	Group III (no I.V Dexamethasone) n (%)	p
Positive Tolerability to take oral	29 (%58.0)	47 (%94.0)	6 (%12.0)	0.001**
Negative Semisolid/solid food within first 24 h	21 (%42.0)	3 (%6.0)	44 (%88.0)	

Chi-square test is used.

** $p < 0.01$.

side effect of dexamethasone [7]. Literature studies recommend intraoperative usage of dexamethasone in pediatric tonsillectomy because of low risk, low cost and beneficial postoperative effects of dexamethasone [3,6,7,16–18]. Steward et al. found that there was significant decrease in postoperative morbidity in patients who were given intraoperative single dose dexamethasone during tonsillectomy or adenotonsillectomy. But there is no standard dosage of intraoperative single dose dexamethasone [7]. In our study we also found that there is statistically significant decrease of postoperative morbidity in patients who were given intraoperative single dose dexamethasone. These results correlate with literature studies. We also found that 0.7 mg/kg dosage of IV dexamethasone is more effective on decreasing postoperative morbidity when compared with 0.2 mg/kg dosage.

5. Conclusion

In our study we found that there is statistically significant decrease of postoperative morbidity in patients who were given intraoperative single dose dexamethasone during tonsillectomy or adenotonsillectomy. We thought that 0.7 mg/kg dosage of IV dexamethasone is much a preferable choice depending on its effectiveness on decreasing postoperative morbidity rather than 0.2 mg/kg dosage and beside to this advantage we didn't encounter any side effects.

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