ORIGINAL ARTICLE

Post Tonsillectomy Pain: Role of Single Intraoperative Dose of Dexamethasone

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ABSTRACT

Objective: To determine the effects of a single intra-operative intravenous dose (0.5mg/kg) of dexamethasone on post tonsillectomy/or adenotonsillectomy pain.

Materials and Methods: This prospective, hospital-based analytical (comparative) study was conducted at Departments of ENT, District Headquarter Teaching Hospital (DHQ), and Mufti Mehmood Memorial (MMM) Teaching Hospital, Dera Ismail Khan (DIK) from January 2011 to December 2011. Subjects of either sex, aging 6-30 years with history of recurrent episodes of acute tonsillitis were included. Those having nasal pathology, history of acute tonsillitis within six weeks, bleeding diathesis, or contraindication to steroids, were excluded. An alternate sequential entry was made to group 1 (treatment group), receiving a single dose of intraoperative intravenous dexamethasone and group 2 (control group) with no treatment. The intensity of post operative pain was assessed as mild (0-4), moderate (5-7) and severe (8-10) based on Visual Analogue Scale (VAS) and compared between the groups at 2, 4 and 8 hours.

Results: Out of 100 subjects, 66 were male and 34 female, 50 in each group. The intensity of pain was statistically significantly lower in group 1 than in group 2 at 2, 4, and 8 hours (p=value 0.004, 0.000, 0.000 respectively) as determined by Two-Sample Independent *t* Test.

Conclusion: Single dose of intravenous intra-operative dexamethasone (0.5mg/kg) is recommended for reduction of post tonsillectomy/ or adenotonsillectomy pain.

Key words: Injection dexamethasone, post-tonsillectomy/ adeno-tonsillectomy pain.

INTRODUCTION

Tonsillectomy is one of the commonest otolaryngological procedures performed, representing approximately 20-40% of surgical procedures performed in this field[1]. Despite advancement in surgical and anaesthetic techniques, the post-operative pain still remains a significant problem. Tonsillectomy in children is typically accompanied by 7-20 days of moderate to severe local pain with or without referred otalgia[2]. The most probable mechanism for post-tonsillectomy pain is the reflex muscle spasm caused by inflammation and irritation of the pharyngeal musculature[3]. The other probable cause is the exposed nerve endings in tonsillar fossae after tonsills removal. The analgesic effect of steroids has been observed by Aasboe et al for haemorrhoidectomy surgery[4]. Different modalities for managing the post operative pain are used by surgeons depending upon their own choice. These include, use of intravenous opoids, NSAIDS, local anaesthetic agents, nerve blocks and steroids[5,6]. The objective of this study was to determine the pain reducing effect of a single intra-operative intravenous dose of dexamethasone in post tonsillectomy/ or adeno-tonsillectomy patients.

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MATERIAL AND METHOD

This prospective, hospital-based analytical (comparative) study was conducted at Departments of ENT, DHQ Teaching Hospital, and MMM Teaching Hospital, DIK from January 2011 to December 2011. Subjects of either sex, aging 6-30 years, with history of recurrent episodes of acute tonsillitis were included. Those having nasal pathology, history of acute tonsillitis within six weeks, bleeding diathesis, or contraindication to steroids, were excluded. An alternate sequential entry was made to group 1 (treatment group), receiving a single dose of intraoperative intravenous dexamethasone and group 2 (control group) with no treatment.

All subjects were admitted. A written informed consent containing terms about inclusion in study and benefits and risks involved, was obtained from each patient. Detailed otorhinolaryngological history and examination was carried out. All subjects were subjected to total and differential leakocytic counts, clotting time and bleeding time, and HBsAg and Anti-HCV. The anaesthetic protocol was standardized for all subjects. After giving calculated doses of propofol and atracurium, endotracheal intubation was done. Anaesthesia was maintained with isoflurane, oxygen and nitrous oxide. The calculated dose of dexamethasone (0.5mg/Kg) was given to group 1 subjects. Tonsillectomy was performed by sharp dissection snare technique in all the patients by the

same surgeons. Haemostasis was secured by pressure gauze or suture ligature (silk 1 or catgut 2/0) and not by electrocautery. When indicated, the adenoids were removed (22 patients) using adenoid curette with guard followed by curette without guard. The intensity of post operative pain was assessed on a ten-point Visual Analog Scale (VAS) where 0 represents no pain and 10 represents severe pain. This 0 to 10 point scale was categorized into a 3 point scale as mild (0-4), moderate (5-7) and severe (8-10) pain and was labeled as 1, 2 and 3 as numerical variables for an easy statistical analysis. Score above 4 was the cut off point and additional analgesia was provided in the form of diluted slow intravenous ketorolac 0.5 mg/kg body weight when the visual analogue scale was above that value and efficacy was determined on the basis of variable score. Lower the score more effective will be the drug. A Performa was used for each patient having following variables noted and entered into the data sheet of SPSS 17: gender and age as demographic and independent variables and post operative pain at 2, 4 and 8 hours as study and dependent variables.

Gender (nominal data) was expressed as frequency and percentage. Age and pain at 2, 4 and 8 hours (numerical data) were expressed as mean and standard deviation and their differences between the groups were determined by Two-Sample Independent *t* Test. P value of <0.05 was considered as statistically significant.

RESULTS

A total of 100 patients with 50 patients in each group, were included in the study over a period of one year. The age ranged from 6-30 years. Mean age of the patients in group 1 was 15.74 +/- 6.53 years and 14.18 +/- years in group 2. The difference in mean age between the groups is not statistically significant (p= 0.2338). Males (66%) out-numbered the females (34%) in both groups. (Table-1)

Table-2 shows group wise frequency (number) of patients at 2, 4 and 8 hours post operative. As described in data collection above, the ordinal data of 3 grades of severity of post operative pain are considered as numerical data and analyzed for group differences of means by the Two-Sample Independent t Test at 2, 4 and 8 hours post operatively. The differences of means between the group 1 (treatment group) and group 2 (control group) at all the 3 points of time are highly significant statistically. So it is proved that intravenous intraoperative dexamethasone is helpful in decreasing post operative pain in post tonsillectomy/ or adeno-tonsillectomy patients (Table-3).

Table 1:Group wise gender distribution

Group	Male)	Female	Total
Group 1	37 (37 %)	13 (13 %)	50
Group 2	29 (29 %)	21 (21 %)	50
Total	66 (66 %)	34 (34 %)	100

Table 2: Frequency of Post operative pain at 2, 4 & 8 hours

Severity of pain	At 2 hours		At 4 hours		At 8 hours	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Mild (1)	19 (38)	9 (18)	33 (66)	15 (30)	37 (74)	21 (42)
Moderate (2)	18 (36)	15 (30)	10 (20)	13 (26)	8 (16)	11 (22)
Severe (3)	13 (26)	26 (52)	7 (14)	22 (44)	5 (100	18 (36)

Table 3: Difference in severity of Post operative pain at 2, 4 & 8 hours

Severity of pain	At 2 hours		At 4 hours		At 8 hours	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Patients no.	50	500	50	50	50	50
Means of Pain	1.88	2.34	1.48	2.14	1.36	1.94
SD	0.80	0.77	0.74	0.86	0.66	0.89
Df	1		1		1	
t- value	-2.93		-4.13		-3.68	
p-value	0.004		0.000		0.000	

DISCUSSION

Post operative pain continues to be a common concern after tonsillectomy. It is a leading cause of dehydration and unanticipated hospital admissions in post tonsillectomy patients and increases the total health care cost. To minimize the post operative pain anaesthesiologists and otolaryngologists have focused primarily on anaesthetic technique with maximal analgesic potential in the post operative period. The efficacy of dexamethasone as an analgesic in tonsillectomy patients has been well discussed in literature[7,8,9].

Clinicians believe that adults tolerate post-tonsillectomy pain more poorly than do young children. Whether this is because they have more scarring from repeated infections, resulting in more muscle damage during tonsillectomy, or are better

able to express their discomfort, or other reasons, is a matter of debate[10].

In the present study 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. By administering via intravenous route, it avoids the side effects like gastritis etc. By inhibiting phospholipase enzyme, corticosteroids block both the cyclooxygenase and lipooxygenase pathways and thus prostaglandin production, thereby leading to pain relief[15].

The age range of our patients is almost similar to that in the study by Buland K et al[11]. Contrary to our results, in a double-blind, randomized, placebo controlled trial from Kingdom Saudi Arabia, patients were aged years 18 or older[12] while in the study by Alajmi MA et al, all of the patients were from pediatric age group[13]. Our study is consistent with other studies in showing male preponderance[11,13]. But an equal distribution between two sexes had been reported in another study[12].

Patients treated with dexamethasone in the present study reported much less pain, the results being statistically significant (p=<0.05). This positive outcome may be due to the rout of administration. Matching our results statistically significant differences were noted in pain scores between the steroid and control groups after a single intra-operative dose of dexamethasone in tonsillectomy/ adenoidectomy patients[12,13,14,15].. McKean et al did a double-blind randomized controlled trial of intravenous steroid for adult tonsillectomy and concluded that a single dose of 10 mg of dexamethasone given intravenously, at induction of anaesthesia for adult tonsillectomy significantly decreased the pain scores for the day of operation and the mean pain score for the week post-operatively was significantly reduced in these patients[16]. Stewart et al. also reported that dexamethasone reduces postoperative pain and analgesic requirements after adult tonsillectomy[17].

Contrary to our results Carr et al reported only slightly reduced pain over the first 10 days after surgery in non-pediatric patients undergoing electrocautry tonsillectomy, given an intravenous single dose of 20-mg dexamethasone intraoperatively[10]. Similarly Tewary et al, found that steroids have no appreciable effect on the amount of postoperative pain[18].

The present study is limited because of the small study groups. A large sized, prospective, randomized and a multi centre study is recommended to study the effects of steroids on pain control in the first 8 to 12 hours after tonsillectomy/or adenotonsillectomy.

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