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Original Article

Role of Preoperative Dexamethasone in Reduction of Post Tonsillectomy Pain

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Abstract

Objective: To assess the efficacy of Preoperative intravenous dexamethasone in reducing postoperative tonsillectomy pain.

Material and Method: This randomized controlled study was done at Social Security Hospital Islamabad from 2009-2014. All the patients undergoing tonsillectomy for chronic tonsillitis were included in this study. We divided the patients into adults; group A, above 12years and children; group B, below 12 years. Adults and children were further divided into A1, A2, B1 and B2. Group A1 and B1 received preoperative intra venous dexamethasone, 8mg and 4mg respectively. Postoperatively all the patients were evaluated for pain after 6 hours, 24 hours and on 7th postoperative day. Evaluation of pain was done by pain ladder scale based on observation and facial expressions and by asking the patients. Statistical evaluation was done. Chi square test was applied.

Results: Total number of patients was 480. Adults (A) were 150 and children (B) were 330. Only 12% of the patients were pain free after 3rdday and 47% after 7th day in patients without dexamethasone as compared to 41% and 93% respectively with dexamethasone. P value was <0.05.

Conclusion: Single preoperative dose of dexamethasone can reduce the postoperative tonsillectomy pain. It improves oral intake, reduces hospital stay without causing any side effects.

Key words: Analgesia, Dexamethasone, Post-operative morbidity, Tonsillectomy.

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Introduction

Tonsillectomy is the common surgical procedure in ENT. Although there is revolution in surgical techniques, but still it is the commonest procedure with frequent postoperative morbidities.[1,2]Worst pain after tonsillectomy with any method is the commonest cause that lowers the quality of life of patients and increases the postoperative hospital stay.[3,4] It also has an effect on eating and thus increases morbidity. Moreover, mortality rate increases with high incidence of postoperative bleeding.[5]Dexamethasone has been used for postoperative nausea, vomiting and inflammation.[6]Steroids inhibit phospholipase, thereby decreasing products of the cyclooxygenase and lipoxygenase pathways which aggravate pain. Corticosteroids also inhibit expression of cytokine genes and release of proinflammatory enzymes, bradykinin, and neuropeptides from injured nerve terminals, all of which also worsen pain. In addition, corticosteroids decrease perioperative pro-inflammatory mediators including interleukins 1, 6, and 8, along with tumor necrosis factor, C-reactive protein, and leukocyte adhesion molecules. Unlike with most analgesics, many effects of corticosteroids require gene expression and protein production and thus have a delayed onset. Moreover, preoperative dosing appeared more effective then intraoperative administration.[7]

Dexamethasone is preferred because of its long term effects.[8]Analgesic effect of dexamethasone has been observed for tooth extraction.[9] There are several studies with different results to see the analgesic effect of dexamethasone in post tonsillectomy patients.[10] The objective of this study was to determine efficacy of single preoperative intravenous injection of dexamethasone in relieving postoperative tonsillectomy pain

Materials and Methods

This randomized controlled study was done at Social Security Hospital Islamabad from 2009-2014. All the patients undergoing tonsillectomy for chronic tonsillitis were included

in this study. Criteria for chronic tonsillitis was recurrent acute tonsillitis; 6-7 attacks in one year, 4-5 attacks in a year for last 2 years or 2-3 attacks in a year for last 3 years. Clinical diagnosis was made with prominent crypts of tonsils, flaring of anterior faucial pillar, extrusion of pus from tonsil while pressing anterior pillar over tonsil and permanent non tender enlargement of Jugulodiagastric lymph nodes. All the patients undergoing tonsillectomy for reasons other than chronic tonsillitis; suspicious of malignancy, peritonsillar abscesses, foreign body in tonsil, sleep apnea, were excluded from the study. Patients had any other procedure like adenoidectomy along with tonsillectomy were also excluded from study. We didn't include the patients who developed any complication during or after the surgery. All the patients were admitted in the hospital. Preoperative investigations; blood complete picture (CP), Hepatitis profile, prothrombin time, activated partial prothrombin time were done. Written consent was taken from all adult patients and from parents of children about pain evaluation study. We divided the patients into adults; Group A, above 12years and ; group B, below 12 years. Adults and children were further divided into A_1, A_2, B_1 and B_2. Group A1 and B1 received preoperative intra venous dexamethasone, 8mg and 4mg respectively. All the tonsillectomies were done under GA by bipolar diathermy technique. Postoperatively all the patients were evaluated for pain after 6 hours, 24 hours 3rd and on 7th postoperative day. Postoperative intravenous paracetamol was given to all patients immediately after tonsillectomy. Evaluation of pain was done by pain ladder scale based on observation and facial expressions and by asking the patients about pain, shown in table I. After 6 hours oral paracetamol was given to all patients. All the patients were planned to be discharged after 24 hours on oral paracetamol and were followed up after 3rd and then after 7th day. Pain evaluation was recorded. Statistical evaluation was done by using window SPSS 16. Chi square test was applied.

Table I: Numerical pain score ladder

Pain Ladder Score	Activity	Degree of Severity
0-1	Normal Happy Face	No pain
2-4	Neutral Expression Able to play	Mild
5-6	No Humor Quite	Moderate
7-9	Complain of pain Cries of pain	Severe
10	Irritated Cries consistently	Worst

Table 2: Pain Evaluation in children and Adults with pre-op Dexamethasone

Number of Patients	No Pain		Mild		Moderate		Severe		Worst	
	Children n (%)	Adults n (%)	Children n (%)	Adults n (%)	Children n (%)	Adults n (%)	Children n (%)	Adults n (%)	Children n (%)	Adults n(%)
Pain Evaluation before Tonsillectomy	165	75								
After 6 Hours			105(63.6)	25(33.3)	43(26.0)	32(42.6)	15(9.0)	13(17.3)	2(1.2)	5(6.6)
After 24 Hours			146(88.4)	39(52)	22(13.3)	32(42.6)	5(3.0%)	2(2.6%)	1(0.6%)	2(2.6)
After 3 Days	55 (33.3)	20(26)	109(66)	55(73)	11 (6.6)					
After 7 Days	160(97)	62(82.6)	5(3.0)	13(17.3)						

Table 3: Pain Evaluation in Children and Adults without pre-op Dexamethasone

Number of Patients	No Pain		Mild		Moderate		Severe		Worst	
	Children n (%)	Adults n (%)	Children n (%)	Adults n (%)	Children n (%)	Adults n (%)	Children n (%)	Adults n (%)	Children n (%)	Adults n (%)
Pain Evaluation before Tonsillectomy	165	75								
After 6 Hours			40(24.2)	9(12)	82 (49.6)	24(32)	30(23.6)	33(44)	8(4.8)	9(12)
After 24 Hours			54(32.7)	13(17.3)	76(46)	32(42.6)	39(18.1)	23(30.66)	4(2.4)	8(10.66)
After 3 Days	29 (17.5)		63 (38)	19 (25.3)	60(36.3)	30 (40)	23(13.9)	22(29.3)		5(6.6)
After 7 Days	79 (47.8)	20(26.7)	78(47.2)	24(32)	7 (4.2)	26(34.66)	1(0.6)	5(6.67)		

Table 4: Overall Evaluation of Pain in Adults and Children with and without Dexamethasone

Number of Patients	No Pain n (%)		Mild n (%)		Moderate n (%)		Severe n (%)		Worst n (%)	
	With	Without	With	Without	With	Without	With	Without	With	Without
Pain Evaluation Before Tonsillectomy	240	240								
After 6 Hours			130(54.1)	49(20.41)	75(31.2)	106(44.2)	28(11.6)	63(26.3)	7(2.9)	17(7.08)
After 24 Hours			185(77)	67(27.9)	54(22.5)	108(45)	7(2.9)	28(11.7)	3(1.2)	12(5)
After 3 Days	47(19.5)	29 (12)	182(75)	99(41.25)	8(3.3)	101(42)	3(1.2)	11(4.5)		
After 7 Days	224(93.3)	99(41.2)	14(5.8)	102(42.5)	3(1.2)	33(13.75)		6(2.5)		

Results

Total number of patients was 480. Adults (A) were 150 and children (B) were 330. In adults 112 were male and 38 were female. In children 212 were male and 118 were female. There were 75 patients in A1 and A2 each and 165 patients in B1 and B2 each. After tonsillectomy by diathermy method, pain was evaluated after 6 and 24 hours and thereafter 3rd and 7th days. Results are shown in Tables 1,2,3 and 4. After 6 hours none of the patient in any group was free of pain. In group A2 and B2(without dexa) 20%, 44%, 26%, and 7% were in mild, moderate, severe and worst pain as compared to 54%, 31% 11% and 2.9% in A1 and B1 (with Dexa). After 24 hours none of patient was pain free, 24%, 45%, 11% and 12% were with mild, moderate severe and worst pain in group A2 and B2 as compared to 77%, 54%, 7% and 1.2% in group A1 and B1. After 3 days 12% in group A2 and 19.5% in B2 were free of pain, and none of patient in any group complained of worst pain. Among both the groups, 41%, 42% and 4.5% were with mild, moderate and severe pain in A2 and B2 as compared to 75%, 3.5% and 1.2% in A1 and B1.After 7th day 41% in group A2 and B2 were free of pain as compared to 93% in group A1 and B1. And 42%, 13% & 2.5% were with mild, moderate and severe pain in A2 and B2. In group A1 and B1 5.8% were with mild pain and only 1.2% were with moderate pain. None of patient in A1 and B1 was with severe pain after 7th day with statistically significant p value of<0.05 in both groups.

Discussion

Injectable dexamethasone has been used for a long time for postoperative nausea and vomiting but its analgesic effect is still under trial.[9] Dexamethasone is preferred because it is powerful synthetic glucocorticoid and has long term effect and with minimal side effects.[11] Corticosteroids block both cyclooxygenase and lipooxygenase pathways for production of prostaglandins and causes relief of pain.[12] Main aim of our study was to know the efficacy of single dose of pre op steroids in post tonsillectomy pain.

Overall pain relief in adults with single dose of preoperative dexamethasone was found to be 33%, 52% (mild pain) after 6 and 24 hours and 26% and 82.6% (pain free) after 3 and 7 days respectively as compared to control 12%,17%,25% (mild pain) after 6 hours, 24 hours and 3 days respectively and 26% (pain free) after 7 days. Overall pain relief in children with single dose of preoperative dexamethasone was found to be 63%, 88% (mild pain) after 6 and 24 hour; 33% and 97% (pain free) after 3 and 7 days respectively, as compared to control 24%,32% (mild pain) after 6 and 24 hours 17% and 47% (pain free) after 3 and 7 days respectively.

Our study is comparable with previous studies in which single dose of dexamethasone improved the pain in 51% as compared to placebo 34%, and there was early start of oral diet so there was less chance of secondary hemorrhage.[13,14] It was concluded in that study that it could be used safely in day care surgery. In one of previous study even infiltration of tonsillar fossa with dexamethasone reduced the post tonsillectomy pain.[15] In another study it was seen that excessive use of non-steroidal anti-inflammatory drugs (NSAIDs) has been associated with increased risk of post tonsillectomy bleeding.[16] It has been proved in one study that single preoperative dose of dexamethasone reduced the use of NSAIDs, so there was less chance of bleeding.[17] Same findings are present in our study.

In the same study it was shown that if they used preoperative dexamethasone with NSAIDs, there was better pain control but increase frequency of postoperative bleeding. Without dexamethasone they had to use NSAIDs more frequently and it further increased the frequency of postoperative bleeding.[17,18] Our results are comparable with another study in which no difference was found in pain control in two groups.[19] In some studies multiple injections of dexamethasone pre and postoperatively were required for pain control. In our study better pain control was seen in both adults and children. None of our case of preoperative dexamethasone presented with post tonsillectomy bleeding as they started oral intake early and discharged after 24 hours. In control group 2% of patients presented with secondary hemorrhage. Most of the patients

returned back after discharge because of pain and dehydration. Intravenous fluid was given to them because they started oral intake very late.

Conclusion

Single preoperative dose of dexamethasone can reduce the postoperative tonsillectomy pain. It improves oral intake, reduces hospital stay without causing any side effects.

Conflict of Interest

This study has no conflict of interest as declared by any author.

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