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A PROSPECTIVE STUDY OF THE EFFECT ON PAIN BY INTRAOPERATIVE IV INJ. OF DEXAMETHASONE SODIUM PHOSPHATE IN ADENO-TONSILLECTOMY PATIENTS.

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ABSTRACT

One hundred and eighteen patients, age group ranging from 5 to 31 years who underwent tonsillectomy with adenoidectomy when required and were given intravenous injection of dexamethasone. Out of 118 patients 56(47%) were male and 62(53%) were female. 2 (2%) patients had Grade I tonsillitis, Grade II tonsillitis was diagnosed in 52(44%) patients and 64(54%) had Grade III tonsillar enlargement. Postoperatively all the patients were assessed for pain, immediately after out of anesthesia, 2 hours, 4 hours,6 hours,24 hours by five-point "faces scale". After 24 hours postoperatively the faces scale was 1 in 99(83%) cases. The study recommends the use of dexamethasone intraoperative to alleviate the pain in patients.

INTRODUCTION:

Pain is the most distressing symptom related to surgical procedures. Tonsillectomy is one of the most commonly performed surgery in the world. Tonsillectomy has been performed for over 2000 years. In 1772 nitrous oxide was introduced and ether and chloroform appeared about the middle of nineteenth century and these agents allowed the operation to be performed with some degree of safety. [1] Smith et al used mixture of steroid-penicillin-local anesthesia into the tonsillar fossa and observed reduction in post-operative pain and inflammation [2].Acute inflammation due to tissue injury is important in the pathogenesis of surgical pain and steroids play important role in controlling the pain due to its anti-inflammatory action. Dexamethasone is one of the potent glucocorticoids available, being 25 times more potent than endogenous cortisol. It has 36 to 72 hour of biological half-life. Steroids inhibit production of inflammatory cell factors such as cytokines in macrophages, monocytes and lymphocytes which decreases extravasation of leukocytes, release of lysosomal enzymes and vascular permeability in the areas of injury leading to reduction in edema. Steroids also inhibit phospholipase enzyme which blocks the cyclooxygenase and lopooxygenase pathways, and reduce prostaglandin production thus relieving pain [3]. Several studies in children and adults were undertaken to study the efficacy of dexamethasone in alleviating the post-tonsillectomy pain. Plante J undertook the systemic review and meta-analysis of randomized controlled trials to evaluate the effect of systemic steroids on post-tonsillectomy bleeding and interventions and concluded that systemic steroids should be used with caution, and the risk and benefits weighed, for the prevention of postoperative nausea and vomiting after tonsillectomy before further research is performed to clarify their conditions of use [4]. The objective of this study was to determine the pain reducing effect of single intraoperative intravenous dose of dexamethasone in post-tonsillectomy/ or adenotonsillectomy patients.

MATERIAL AND METHOD

This prospective, hospital base study was conducted at department of ENT, Dhiraj Hospital, Piparia, Vadodara, Gujarat and Department of ENT ,BJMC, Pune, from 13 May 2014 to 14 may 2017. The inclusion criteria were patients of either sex above the age of 5 years with chronic tonsillitis. The patients with diabetes, hypertension, coagulopathy disorders, cardiovascular and renal diseases, on treatment with corticosteroids, aspirin, or receiving any analgesics or NSAIDS, neuropsychiatric disorders were excluded from the study. The chief complaints of the patients were throat pain, mouth breathing, ear discharge, odynophagia and fever. All the patients underwent preanaesthetic evaluation. All the patients underwent tonsillectomy by cold knife dissection method. Bleeders were ligated using 3-0 silk ligature . Haemostasis was achieved using packs or sutures.Electrocautery was not used.Intravenous dexamethasone 0.7mg/kg was given intraoperative as a single bolus. The patients were closely observed for pain which was assessed using five-point "faces" scale as 0 = smiling face: no pain, 5 = crying face: highest pain score. [5]

RESULTS

Out of 118 patients there were 56 males and 62 females. The age of the patients varied from 5 years to 31 years, the mean age was 12 $\pm$ 5.5.Maximum number 29(25%) males were in the age group of 5 to 10 years while 26 (22%) female patients were in the age group of 5 to 10 years. 20(17%) males were in the age group of 11 to 15 years with 24(20%) females in the same age group.2(1.6%) males and 5(4.2%) females in the age group 16 to 20 years, 4(3%) males and 3(3%) females with age group of 21 to 25 years , 4(3.3%) females in the age group of 26 to 30 years and 1 male in age group of 31-35 years. Throat pain was the most commonly presenting symptom in 111(94%), followed by odynophagia in 84(71%), mouth breathing 69(58%), ear discharge in 20(17%) and fever in 9(7.6%). Out of the 118 patients studied, 64 (54%) had tonsils size of grade III, 52(44%) with grade II and grade I there were 2(1.6%) cases. Postoperative pain was evaluate immediately after anesthetic recovery, at 2nd, 4th ,6th, 24thand 48th hour by visual analogue scale (0 to 5). Immediate after surgery the score was 5 in 84(71%)patients, 4 in 30 (29%) patients and 3 in 4 (3.3%) patients. At 2nd hour the score was 4 in 60 (50.8%), 3 in 48(40%),2 in 10(8.4%) .At the 4th hour the hour the score was 3 in 70 (59%), 2 in 48 (40%) patients.After 6 hours 90(76%) had VAS as 2 patients,28 (23%) patients had VAS as 1. After 24 hours almost 99(83%)patients showed VAS 1, 19(16%) were absolutely pain free and started oral feeds. Patients were discharged on 2nd day.

Table 1:Age

Range	5-31 years
Mean	12
Standard Deviation	+ 5.5

Table 2: Age/ sex distribution

Age(Range)	No. of patients	Male	Female
5-10	55	29(25%)	26(22%)
11-15	44	20(17%)	24(20%)
16-20	7	2(1.6%)	5(4.2%)

21-25	7	4(3.3%)	3(2.5%)
26-30	4	0	4(3.3%)
31-35	1	1(1%)	0
Total	118	56(47%)	62(52%)

Table 3:Most common complaints

Complaints	No. of patients
Throat pain	111(94%)
Odynophagia	84(71%)
Fever	9(7.6%)
Mouth breathing	69(58%)
Eardischarge	20(17%)

Table 4:Grade of tonsil

Grade	No.of patients
Grade I	2(1.6%)
Grade II	52(44%)
Grade III	64(54%)
Total	118

Table 5: Visual analogue scale

Table 6: Post operative VAS

VAS	Postoperative time				
Score	Immediate	2 hours	4 hours	6 hours	24 hours
5	84(71%)				
4	30(25%)	60(50.8%)			
3	04(3.3%)	48((40%)	70(59%)		
2		10(8.4%)	48(40%)	90(76%)	
1				28(23%)	99(83%)
0					19((16%)

DISCUSSION: Elhakim M et al randomized, double blind and placebo controlled study in 120 children to evaluate the effects of a single dose of dexamethasone on the incidence and severity of postoperative vomiting and pain in children undergoing electro-cautery tonsillectomy under standardized general anesthesia. The children were 4 to 11 years old and received dexamethasone 0.5 mg/kg after induction of anesthesia. The pain scores were lower (P<0.05) in the dexamethasone group at 30 min and up to four hours after extubation. It was concluded from the study that prophylactic intraoperative single dose (0.5 mg/kg iv up to 8 mg) of dexamethasone decreases the incidence of early and late postoperative vomiting,, reduces pain scores at rest as well as during swallowing and improve the quality of oral intake in children during the first 24 hrs, after electro dissection tonsillectomy without apparent side effects. [5] Except the method of surgery ,the results of this study are very much comparable with our study.

Malde AD et al studied 90 patients of age > 3 years the mean age being 12.04 ± 4.69 years. They administered 0.15 mg/kg dexamethasone diluted in 5 ml saline IV. They evaluated the pain by objective pain scale (OPS) and visual analogue scale (VAS). In their study the OPS and VAS scores were lower in dexamethasone group, throughout the postoperative period. Majority of the dexamethasone treated patients were pain free in 6 to 24 hours. They concluded that a single IV dose of 0.15 mg/kg dexamethasone given following induction of anesthesia, provides good and prolonged analgesia, reduced oedema and resulted in earlier and better quality of oral intake without side effects. [6]

Khani A et al conducted randomized, double blinded and placebo-controlled study in 66 patients who were 4 to 12 years old who underwent sharp dissection technique for tonsillectomy with or without adenoidectomy. They administered dexamethasone 0.5 mg/kg diluted with equal volume of saline IV after induction of anesthesia before surgery in the study group. The assessment was done at the 1, 3, 6 and 8 hours. Pain was assessed using a five-point "faces" scale (1 = smiling face: no pain, 5 = crying face: highest pain score. They observed reduced pain score; reduced vomiting and increased quality of oral intake during hospital stay [7]. Jampole P and Jampole P randomized 36 patients aged 7 to 48 years to receive intravenously dexamethasone or placebo on day 1 and day 2. They studied the pain level of throat pain otalgia, pain on open mouth and pain on swallowing on the 4, 24, 48 and 72 hours after procedure. According to them although statistical difference was not seen at $p < 0.5$, the means of post-operative pain score in treated groups were seem to be lower than controlled group ($p < 0.1$), especially means of the pain on otalgia at 24, 48 and 72 hours ($p = 0.0851, 0.0631, 0.0739$ respectively), pain on open mouth at 72 hours ($p = 0.0613$), and pain on swallowing at 24,48 and 72 hours after tonsillectomy ($p = 0.0946, 0.0671, 0.0794$ respectively)[8] . The study included a wide range of age groups and the patients received 4 mg of dexamethasone infiltrated into tonsillar fossa (2mg each side) immediately after surgery. The results of this study cannot be compared with any other studies including our due to large number of variables.

Khan MS et al in 50 patients studied the role of single intraoperative dose of dexamethasone in the post tonsillectomy pain. The patients were in the age group of 6 to 30 years, the mean being 15.74 ± 6.53. The patients in the study group received 0.5 mg/kg dexamethasone intraoperative. Tonsillectomy was performed by sharp dissection snare technique in all patients. Intensity of pain was assessed by Visual Analog Scale (VAS) at 2nd and 4th and 8th hour. The differences of means between the treatment group and control group at all the three points of time were highly significant statistically. So from the study it was proved that intravenous intraoperative dexamethasone is helpful in decreasing postoperative pain in post tonsillectomy/ or adeno-tonsillectomy patients [9]. Except the low dose and variability of the age group this study is comparable to our study.

Recently a prospective study to compare the effects of pre, intra and post-operative steroids (dexamethasone sodium phosphate) on post tonsillectomy morbidity was carried out in 100 patients aged above 15 years. Dexamethasone was used in the dose of 0.5 mg/kg as a single dose. All the patients underwent tonsillectomy using dissection and snare technique. Pain was assessed by Visual Analog Scale (VAS) from 0 – 6, every hourly for first 2 hours and second hourly for next four hours and then 6, 12, 24 hours. Recording was made at 30 min., 6, 12, 24 h. Although pain score was high at 30 min post operatively in all the groups (around 5), there was gradual decline in the pain score in dexamethasone group. Patients treated with dexamethasone particularly the pre and intraoperative groups showed a general trend toward lower pain score than post operatively. Overall pain score was found to be more in the control group at 6 h postoperatively and showed similar trend for next 24 h. It was concluded that a single intravenous dose of 0.5 mg/kg dexamethasone at a maximum of 20 mg, given following induction of anesthesia or at the time of surgery, provided good and prolonged analgesia, reduced nausea and vomiting and resulted in earlier and better quality of oral intake without side effects[3].

From the study of 118 patients who underwent tonsillectomy/ or adeno-tonsillectomy, the use of IV 0.7mg/kg dexamethasone intraoperative is effective in alleviating the postoperative morbidity of the children due to pain.

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