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ORIGINAL RESEARCH

Role of single pre-operative dose of dexamethasone in controlling post operative pain following tonsillectomy: A hospital based comparative study

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Abstract

Aim: To determine the efficacy of single dose of Dexamethasone (0.5mg/kg) in reducing the post-operative pain following Tonsillectomy operation.

Settings and Design: A hospital based analytical (comparative) study was conducted in Department of ENT, TMC & Dr. BRAM Teaching Hospital, Hapania, Agartala, West Tripura for a duration of 3 months (October to December, 2021) after the approval from Institutional Ethics Committee.

Method and Materials: A total of 40 patients with recurrent attacks of acute tonsillitis or with Chronic Tonsillitis and in need of surgical treatment were included in the study. An alternate sequential entry was made into two groups. Group 1 (Treatment group) received single dose of intravenous Inj. Dexamethasone (0.5mg/kg) pre-operatively while Group 2 (Control Group) received similar amount of Normal saline. Surgical procedure, anesthetic protocol and post-operative medications were standardized in both the groups. Post-operative pain assessment was done at 12, 24 and 48 post-operative hours using Visual analogue scale (0-10) and compared between two groups.

Statistical analysis used: 2 sample independent t- test was used to compare means and standard deviation between two groups.

Result: Mean pain score was significantly lower intreatment group compared to control group at 12^{th} post-operative hour (t value = -15.739), at 24^{th} post-operative hour (t-value = -13.161**)** and at 48^{th} post-operative hour (t-value = -8.110) with p-value being 0.000 (highly significant) at all three observation periods.

Conclusion: Single dose of Inj. Dexamethasone (0.5mg/kg) administered intravenously in pre-operative period is efficacious in controlling Post-operative pain following Tonsillectomy operation.

Keywords: Dexamethasone; Tonsillectomy; Post-operative pain; Anesthesia

Introduction

Tonsillectomy is one of the most commonly performed surgical procedure done by Department of Otorhinolaryngology. But post-operative pain associated with it becomes a

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major source of morbidity and poses a challenge for the surgeons as well as the anaesthesiologists. Different modalities for tackling this has been tried since ages. But despite the advancements in surgical and anaesthetic techniques, the management of post operative pain still remains a major challenge.[1] Post operative pain following tonsillectomy includes throat pain and referred otalgia. It limits oral intake, dehydration as well as prolongs hospital stay for the patient.

Post tonsillectomy pain is probably the result of muscle spasm caused by inflammation and irritation of the pharyngeal musculature [2]. The other probable cause is the exposed nerve endings in tonsillar fossae after tonsil removal. The analgesic effect of steroids has been observed by Aasboe et al for haemorrhoidectomy surgery [3].

Prostaglandins are important mediators of pain. By inhibiting the phospholipase enzyme, the glucocorticoids block both the cyclooxygenase and the lipooxygenase pathway in the inflammatory chain reaction.

Injection Dexamethasone has an anti-inflammatory effect [4] and also proved its analgesic effect in other surgical specialties [5,6].

Despite the availability of various analgesic regimens to counter the post-operative pain following Tonsillectomy, patient surveys have indicated that moderate-to-severe post-operativepain is still poorly managed.

This study focusses on whether Dexamethasone has got the potential to reduce the pain followingTonsillectomy and thereby the post-operative morbidity.

Materials and method

A hospital based analytical (comparative) study was conducted in Department of ENT, TMC & Dr. BRAM Teaching Hospital, Hapania, Agartala, West Tripura, and PIN-799014 for a durationof 3 months (October to December, 2021).

Subjects of either sex, aging 12-30 years, with history of recurrent episodes of acute tonsillitis or Chronic tonsillitis were included. Patients aged less than 12 years and more than 30 years, patients with hypersensitivity to Dexamethasone, history of Hypertension or Diabetes mellitus and patients with bleeding diathesis were excluded from the study.

After obtaining approval from Institutional Ethics committee, a total of 40 patients were includedin the study.

An alternate sequential entry was made to group 1 (treatment group), receiving a single dose of preoperative intravenous dexamethasone- 1 hour before surgery and group 2 (control group) receiving similar amount of normal saline injected intravenously. All subjects were admitted. Awritten informed consent containing terms about inclusion in study and benefits and risks involved, were obtained from each patient. Detailed otorhinolaryngological history and examination was carried out. All subjects were subjected to pre-anaesthetic investigations and check-up and fitness obtained from Anaesthesiologists. The calculated dose of dexamethasone (0.5mg/Kg) was given to group 1 subjects- 1 hour before initating General anaesthesia for undergoing surgery. The anaesthetic protocol was standardized for all subjects. After giving calculated doses of propofol and atracurium, endotracheal intubation was done. Anaesthesia was maintained with 2-3% sevoflurane, oxygen and nitrous oxide. Reversal done with Neostigmine (50mcg/kg) and Glycopyrolate (10mcg/kg). Tonsillectomy was performed by Dissection and snare method in all the patients by the same surgeons. Haemostasis was secured by pressure gauge, bipolar cautery or suture ligature (silk 1-0). All patients were given Tab. Paracetamol 500 mg orally in 8 hourly intervals for pain relief. Post-operative pain assessment was done on 12, 24 and 48hrs following surgery. 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. Score above 7 was set as the cutoff point and additional analgesia was provided in the form of intramuscular Diclofenac 0.5 mg/kg

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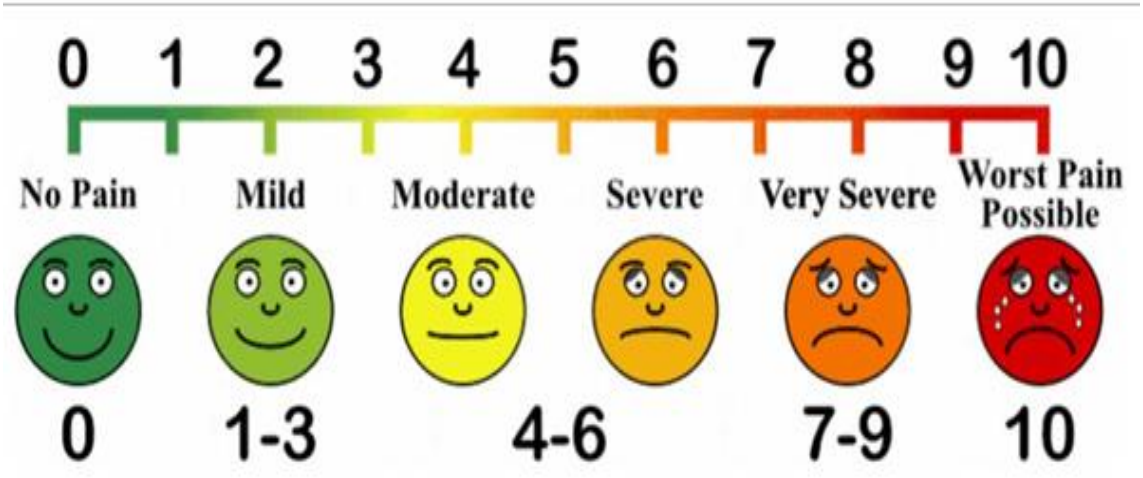
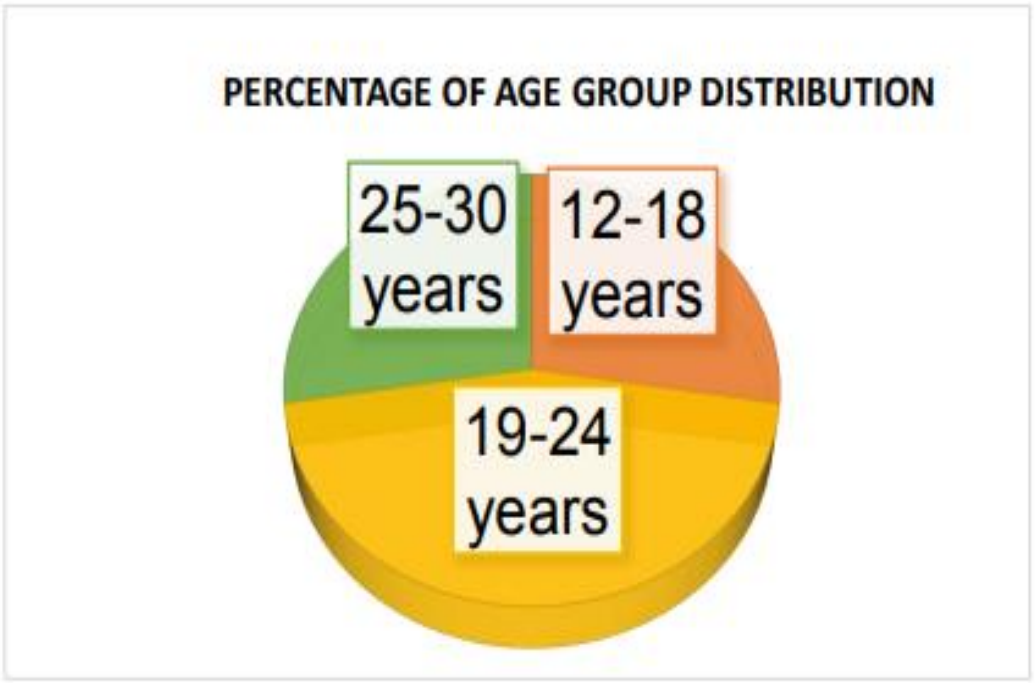
body weight when the visual analogue scale was found to be above that value and efficacy determined on the basis of variable score. Lower the score moreeffective will be the drug. A Proforma containing all necessary details was used for each patienthaving following variables noted and entered into the data sheet of SPSS 23: gender and age as
demographic and independent variables and post-operative pain at 12, 24 and 48 hours as study and dependent variables. Gender (nominal data) is expressed as frequency and percentage. Painat 12, 24 and 48 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.

Fig: Visual Analogue Scale for measuring intensity of Post-operative pain at 12, 24 and 48 hrs



RESULT



Mean age= Group 1= 20.70 ± 4.589; Group 2= 21.80 ± 4.731. Difference in mean age between 2 groups not significant (p= 0.460)

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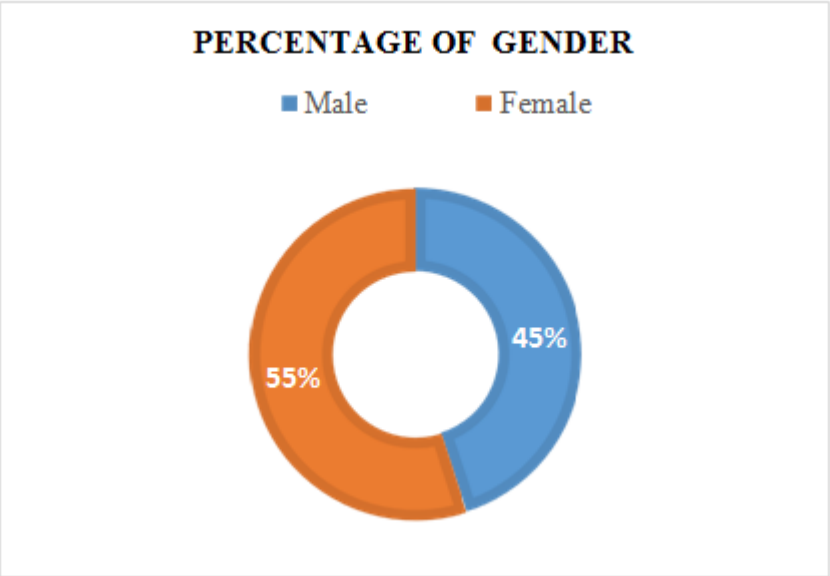

Table- Post-operative Pain assessment on visual-analogue scale

Severityof pain	12TH post-operative hour		24TH post-operative hour		48TH post-operative hour	
	Group- 1	Group- 2	Group- 1	Group- 2	Group- 1	Group- 2
No. Of patients	20	20	20	20	20	20
Means ofpain	2.45	7.55	2.35	6.35	3.50	6.50
SD	1.050	0.999	0.813	1.089	1.100	1.235
Df	38	37.905	38	35.147	38	37.501
t- value	**-15.739**		**-13.161**		**-8.110**	
p- value	**0.000**		**0.000**		**0.000**	

The overall mean of pain scores were less in the study group as compared to the control group.Furthermore, none of the patients of the study group experienced any side effects.

Discussion

Single dose of intravenous Dexamethasone (0.5mg/kg) given 1 hour pre-operatively significantly reduces post-operative pain following tonsillectomy compared to the control group.

Fukami et al.[7] concluded that pre-operative dexamethasone significantly reduces the incidence of post-operative nausea and vomiting, pain and fatigue after Laparoscopic Cholecystectomy and the employed regimen was found to be safe.

Worni et al.[8] found that pre-operative single dose of dexamethasone significantly reduced pain, nausea and vomiting and improved post-operative voice function within 48hrs after Thyroid resection.

Single dose of dexamethasone proved analgesic potential at 2, 4 and 8 hrs post-operative period following tonsillectomy in study by Muhammad Ismal Khan et al.[9] while this study proved it till 48 hrs post-op period.

In the similar study by DA Hiramath[10], Single dose of Dexamethasone effectively controlled post operative pain following tonsillectomy till 24 hrs. (p= 0.0000006)[2]

S McKean et al.[11] conducted a double blinded randomized controlled trial in 2006 on Use of intravenous steroids at induction of anaesthesia for adult tonsillectomy to reduce postoperative nausea and vomiting and pain in Scotland and this revealed that a single dose of 10mg Dexamethasone reduced mean pain score significantly for 7 post-operative days (P<0.001).

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Khalid Buland[12] conducted a study in 2010 on Efficacy of Single dose perioperative intravenous steroid (dexamethasone) for postoperative pain relief in tonsillectomy patients which concluded that Single dose perioperative intravenous injection of dexamethasone in tonsillectomy patients reduce postoperative tonsillectomy pain.

Tissue injury induced acute inflammation, nerve irritation and spasm of pharyngeal muscles-play role in genesis of post-operative pain following tonsillectomy. Dexamethasone inhibits phospholipase enzyme, thereby oxygenase and lipooxygenase pathway and thus reduce synthesis of Prostaglandins and thereby reduces edema and pain.[1]

Dexamethasone being highly potent with long half-life (36-72 hours) for glucocorticoid activity, the effect would remain even after the discharge of the patient.

By administering via IV route, avoids side effects of NSAIDs like gastritis, peptic ulceration. Also proves a safe mode of pain relief in asthmatics.

The present study is limited because of the small study population. A large sized, prospective, randomized and a multi-center study is recommended to study the effects of steroids on pain control following Tonsillectomy.

Conclusion

This study proved that single dose of Inj. Dexamethasone (0.5mg/kg) administered intravenously in pre-operative period is efficacious in controlling Post-operative pain following Tonsillectomy operation by Dissection and snare method at 12, 24 and 48 hours post-operative period (p=0.000).

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