

## Control of Postoperative Pain with Peritonsillar Infiltration with Bupivacaine 0.25% in Tonsillectomy Patient

<sup>1</sup>Dr. Vishal Tyagi, <sup>2</sup>Dr. Kamna Sindhu Pal, <sup>3</sup>Dr. Deepika Garg,  
<sup>4</sup>Dr. Sharmishtha De, <sup>5</sup>Dr. P. S. Nagpure,

<sup>1,2,3,4</sup>(Assistant Professor, Deptt. of NT & Head Neck Surgery MGIMS, Sewagram )

<sup>5</sup>Professor and Head, Deptt. of ENT & Head Neck Surgery, Mahatma Gandhi Institute of Medical sciences (MGIMS), Sewagram

**Abstract:** We conducted a randomized, controlled, double-blind, prospective study to evaluate the effect of intraoperative bupivacaine injection in tonsillar fossa to control the postoperative pain following dissection method tonsillectomy in 40 patients. 20 patients were injected with bupivacaine 10ml of 0.25% and 20 patients were injected with normal saline. Following the surgery we completed the questionnaire to evaluate their pain, oral intake and pain on full jaw opening. After completion of the study we found no statistically significant difference in pain level, oral intake and full jaw opening between the two groups. So this study tells that for pain control bupivacaine as well as placebo had similar effect.

**Key words:** Pain, bupivacaine, tonsillectomy

### I. Introduction

The most important primary cause for morbidity following tonsillectomy in early postoperative period is Pain. This resulted in decrease oral intake, dehydration and also prolonged hospitalisation. Various method of decreasing postoperative pain has been devised. Boliston and Upton<sup>1</sup> showed that the local infiltration of lidocaine 0.5% containing epinephrine into peritonsillar bed of adults undergoing tonsillectomies under general anesthesia resulted in greater ease in dissection as well as significant reduction in operative blood loss. Ginstrom et al<sup>2</sup> reported that while intraoperative infiltration of bupivacaine/epinephrine had only marginal effect on pain. In a paediatric population, Naja et al<sup>3</sup> found that a preincision injection of local anesthesia resulted in significantly less postoperative pain at rest, on jaw opening and during intake of a soft diet compared with findings in a placebo group. Several otolaryngologist anecdotally support intraoperative infiltration with long-acting amide anesthetic, bupivacaine hydrochloride, for postoperative pain control. In this prospective, randomized study, we found that no one has reported the possible benefit to children or adult with local infiltration with bupivacaine and normal saline group.

Goal of this study was to evaluate the effect of peritonsillar infiltration when performed with one of two different solution (0.25% bupivacaine hydrochloride containing epinephrine and normal saline) upon postoperative pain levels.

### II. Patients, Materials And Methods

**STUDY POPULATION:** - Our study population consisted of 40 patient with 19 male and 21 female who had undergone tonsillectomy for either chronic tonsillitis or tonsillar hypertrophy. The number of infection ranged from 3 to 7.

### III. Method

For the purpose of infiltration patients were randomly assigned into group-I and group-II. Anesthesia was induced with IV thiopental and mask inhalation of 70% N<sub>2</sub>O, 30% oxygen and halothane. Following induction of general anesthesia but prior to the onset of surgery the patient were placed in Rose's position with Davis -Boyle mouth gag.

Following the completion of tonsillectomy, patient received 10ml injection of either 0.25% bupivacaine with 1:200,000 epinephrine (n=20) or normal saline (n=20).

In adult severity of their pain was evaluated with a 10-point pain scale. Pain experienced at 2, 6, and 10 hours after surgery was best described with adjective like 1)mild, 2)moderate, 3)severe, 4)worst . Second oral intake for the first 10 hours was measured as follow 1) none 2) upto 360ml, 3) 360-730ml or 4) more than 730ml. Third describe the level of pain on jaw opening at 10 hrs after surgery 1) none, 2) mild, 3) moderate, 4) severe, 5) worst ever felt.

**Statistical analysis:** - Collected data were analyzed using student *t* test and a *p* value of < 0.05 was considered to be statistically significant

**Postoperative care:-**

Patients were given Diclofenac as needed for pain and Ondansetron as needed for nausea and vomiting. Discharge medications included Cap.Amoxicillin for 10 days.

**IV. Results**

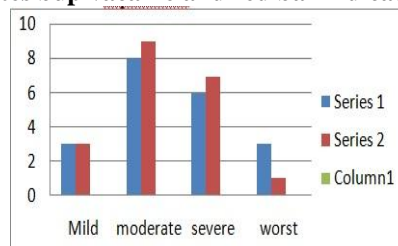
Patient were allocated in two groups, each group had 20 patients. One group received bupivacaine and Second group received normal saline. There were 19 male and 21 female. None of the patient showed any adverse reaction.

**Table -1: Age and Sex wise distribution (n= 40)**

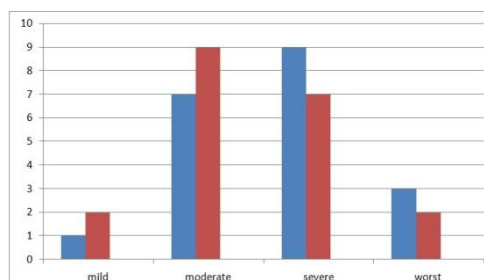
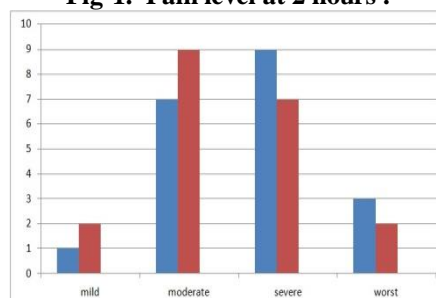
Age years	Group-I		Group-II	
	Male	Female	Male	Female
12-20	6	7	6	4
21-30	1	1	3	4
>30	2	3	1	2
<b>Total</b>	<b>9</b>	<b>11</b>	<b>10</b>	<b>10</b>

**PAIN SCORE FOR ADULT (N=40)**

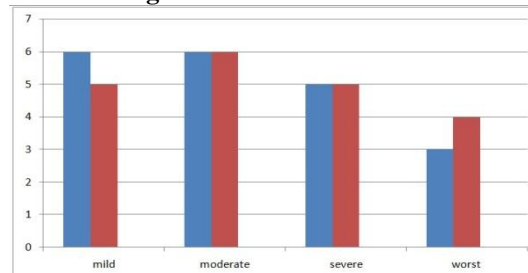
Blue bar indicates bupivacaine and red bar indicates normal saline.



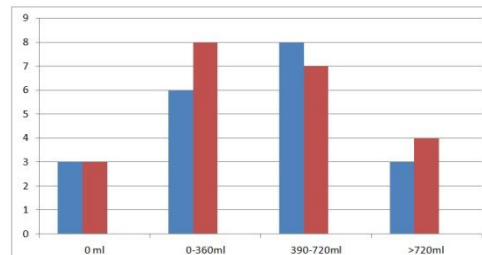
**Fig-1. Pain level at 2 hours .**



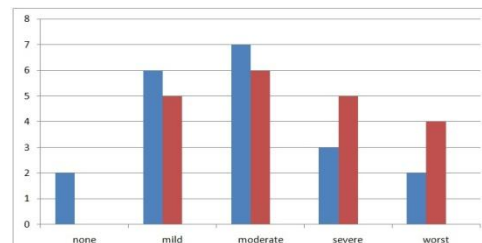
**Fig-2. Pain level at 6 hours**



**Fig-3. Pain score at 10 hours**



**Fig-4. Oral intake at 10 hours**



**Fig-5. Pain on jaw opening at 10 hours**

**Pain:** - Most patient having there moderate or severe degree of pain. There is no statistically significant in mean pain score between the bupivacaine and normal saline group at 2 hrs ( $p= 0.33$ ), 6hrs ( $p=0.32$ ) and 10 hrs ( $p= 0.33$ ) postoperatively (fig-1, 2, 3 respectively).

**Oral intake:** - The oral intake between the two groups was showing on fig-4. 3 patients from each group drank no fluids in first 10 hrs. Although maximum patient in both group have oral intake  $> 360$ ml, the overall there is no statistically significant between these two groups ( $p=0.63$ ).

**Pain on jaw opening:** - Few patients in both the group have experienced severe and worst pain on full jaw opening at 10 hrs. Furthermore there is no correlation was noted between perceive level of pain and full jaw opening ( $p=1.33$ ).

## V. Discussion

Many techniques have been discussed to relief postoperative pain in tonsillectomy patient including surgical and medical.

Lister et al<sup>4</sup> studied on paediatric patients who underwent microdebrider intracapsular tonsillotomy on one tonsil and electrocautery extracapsular tonsillectomy on the other reported significantly less pain on microdebrider side on postoperative days 1 through 9. However Sobol et al<sup>5</sup> found no difference in postoperative pain between children underwent microdebrider intracapsular tonsillotomy or monopolar electrocautery tonsillectomy.

Yusuf Unal et al<sup>6</sup> told that Peritonsillar bupivacaine infiltration is, however, insufficient to control postoperative pain, it is more effective than ropivacaine for reducing postoperative analgesic requirement. Dynamic assessments of pain, such as drinking water or opening the jaw, have been used in past studies, in an attempt to measure pain objectively. (Jebeles et al<sup>7</sup>, Schoem et al<sup>8</sup>)

The majority of previous studies used electrocautery as the dissection method; however, recent evidence has shown that an electrocautery dissection technique increases postoperative morbidity in terms of pain, otalgia, and poor diet when compared with blunt dissection technique. The electrocautery dissection method used in other studies may have altered their results. (Nunez et al<sup>9</sup>, Atallah et al<sup>10</sup>)

The peritonsillar region is innervated by fibers from the glossopharyngeal nerve, the lesser palatine nerves, and the lingual nerve. The premise for LA injection is to obtain blockade of these fibers. (Revil et al<sup>11</sup>) Polites et al<sup>12</sup> found that who underwent Coblation-assisted tonsillectomy reported significantly less pain on postoperative day 1 and 3 than did those who underwent dissection tonsillectomy; there was no significant difference in total recovery time.

According to Ohlms et al<sup>13</sup> there is no significant differences in postoperative pain between treated patient who received single intravenous dexamethasone following tonsillectomy and the controls group.

In previous study, which was conducted in paediatric tonsillectomy, the author found that there is no significant difference in pain relief between two groups who received bupivacaine and placebo (Lynn et al<sup>14</sup>)

Similar study conducted by LCRD Scott R et al<sup>15</sup> who found, bupivacaine offered no advantage over placebo in the control of early postoperative pain following adult local anaesthetic tonsillectomy

As described, the effect of local anesthetics injections on reducing post-tonsillectomy pain is equivocal. Moreover the timing of injections (i.e. preincision or postoperative) does not appear to have any effect on self-rated pain scores.

In our study the effect of bupivacaine seen subjectively was confirmed by full jaw opening at 10 hrs and daily oral intake. The findings of our study have similar of those earlier studies but the use of visual analog scale may be the more appropriate assessment tool (Colloins et al<sup>16</sup>).

The half-life of bupivacaine is 2.7 hours in adults and systemic absorption depend on total dose and concentration administered, route of administration. We found no complication such as seizures, aspiration due to alteration of swallowing reflexes due to bupivacaine administration.

## VI. Conclusion:

Bupivacaine is a safe local anesthetic as newer preparations with more sustained analgesic effects become available. However, in this study bupivacaine showed no advantages over normal saline in the control of early postoperative pain following adult tonsillectomy.

## References

- [1]. Bolliston TA, and Upton J.J.M: Infiltration with lignocaine and adrenaline in adult tonsillectomy. *J. Laryngol Otolaryngol*, 94:1257-1259, 1980.
  - [2]. Ginstrom R, Silvola J, Saarnivaara L. Local bupivacaine-epinephrine infiltration combined with general anesthesia for adult tonsillectomy. *Acta Otolaryngol* 2005; 125(9):972-5.
  - [3]. Naja MZ, El Rajab M, Kabalan W, et al. Pre-incisional infiltration for paediatric tonsillectomy. A randomized double-blind clinical trial. *Int Pediatr Otorhinolaryngol* 2005;69(10):1333-41.
  - [4]. Lister MT, Cunningham MJ, Benjamine B et al. Microdebrider tonsillectomy vs electrosurgical tonsillectomy : A randomized, double blind, paired control study of postoperative pain. *Arch Otolaryngol Head Neck Surg* 2006;132(6): 599-604.
  - [5]. Sobol SE, Wetmore RF, Marsh RR, et al. postoperative recovery after microdebrider intracapsular or monopolar electrocautery tonsillectomy: A prospective, randomized, single-blinded study. *Arch Otolaryngol Head Neck Surg* 2006;132(3):270-4.
- |     |                  |        |        |  |
|-----|------------------|--------|--------|--|
| yes | platform+medline | author | author |  |
|     |                  |        |        |  |
- [6]. Yusuf Unal, Kutluk Pampal, Sibel Korkmaz, Mustafa Arslan Comparison of bupivacaine and ropivacaine on postoperative pain after tonsillectomy in paediatric patients, *International Journal of Pediatric Otorhinolaryngology* Volume 71, Issue 1, Pages 83-87, January 2007.
  - [7]. Jbeles JA, Reilly JS, Gutierrez JF, Bradley EL Jr, Kissin I. Tonsillectomy and adenoidectomy pain reduction by local bupivacaine infiltration in children. *Int J Pediatr Otolaryngol*. 1993;25:149-154.
  - [8]. Schoem SR, Watkins GL, Kuhn JJ, Alburger JF, Zim KZ, Thompson DH. Control of early postoperative pain with bupivacaine in adult local tonsillectomy. *Arch Otolaryngol Head Neck Surg*. 1993;119:292-293.
  - [9]. Nunez DA, Provan J, Crawford M. Postoperative tonsillectomy pain in pediatric patients: electrocautery (hot) vs cold dissection and snare tonsillectomy—a randomized trial. *Arch Otolaryngol Head Neck Surg*. 2000;126:837-841.
  - [10]. Atallah N, Kumar M, Hilali A, Hickey S. Postoperative pain in tonsillectomy: bipolar electrodissection technique vs dissection ligation technique: a doubleblind randomized prospective trial. *J Laryngol Otol*. 2000;114:667-670.
  - [11]. Revill SI, Robinson JO, Rosen M, Hogg MIJ. The reliability of a linear analogue for evaluating pain. *Anaesthesia*. 1976;31:1191-1198.
  - [12]. Polites N, Joniau S, Wabnitz D et al. postoperative pain following coblation tonsillectomy: Randomized clinical trial. *ANZ J Surg* 2006;76(4):226-9.
  - [13]. Ohlms LA, Wilder RT, Weston B. Use of intraoperative corticosteroids in pediatric tonsillectomy. *Arch Otolaryngol Head Neck Surg* 1995;121(7) 373-42.
  - [14]. Lynn M, Broadman, Ramesh I Patel et al. The effects of peritonsillar infiltration on the reduction of intraoperative blood loss and post-tonsillectomy pain in children. *Laryngoscope*. june1989;99: 578-581.
  - [15]. LCRD Scott R, Schoem, Lee Watkins, Jeffrey J et al. Control of early pain with bupivacaine in adult local tonsillectomy. *Arch Otolaryngol Head Neck Surg*. 1993; 119:292-293.
  - [16]. Colloins SL, Moore RA, McQuay HJ. The visual analogue pain intensity scale: what is moderate pain in millimeters? *Pain* 1997;72(1-2):95-7.