

POST-TONSILLECTOMY PAIN REDUCTION BY APPLICATION OF BUPIVACAINE PACK IN THE TONSILLAR FOSSA

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ABSTRACT

Objective: The objective of the study was to find out the efficacy of local anaesthetic agent 'Bupivacaine' in reducing post-tonsillectomy pain by topical application in the tonsillar fossa following tonsillectomy.

Study Design: Case control study.

Setting & Duration: This is a multicentric study, conducted at Hamdard University Hospital, Memon Hospital, Zubaida Medical Centre and Habib Medical Centre, Karachi over a period of two years from July 2006 to June 2008.

Methodology: A total of 205 patients were included in this study, who underwent tonsillectomy for chronic tonsillitis. After removal of the tonsils, right side was packed with a swab soaked in 0.5% bupivacaine and left side with normal saline. Pain was assessed separately on two sides of the throat on visual analog scale of 0 to 10, at time interval of 1, 4, 8, 16 and 24 hours after the surgery.

Results: Mean pain score on the right side after 1, 4, 8, 16 and 24 hour was $3.23(\pm 1.03)$, $3.46(\pm 0.77)$, $3.27(\pm 0.64)$, $3.57(\pm 0.81)$ and $5.01(\pm 1.27)$ respectively whereas on the left side was $5.55(\pm 1.34)$, $4.69(\pm 1.03)$, $5.07(\pm 1.00)$, $5.27(\pm 0.81)$ and $5.61(\pm 1.24)$ respectively. There was a significant difference between the tested side and the control side ($p < 0.01$) at all time intervals.

Conclusion: Post-tonsillectomy pain was effectively reduced by use of topical bupivacaine pack in the tonsillar fossa.

KEY WORDS: Post-Tonsillectomy Pain, Post-Tonsillectomy Morbidity, Topical Anaesthesia

INTRODUCTION

Tonsillectomy even today is one of the commonest surgeries in Ear Nose and Throat (ENT) practice and majority of the patients are of pediatric age group. Pain is the most important cause of post-operative morbidity after tonsillectomy. Pain in the throat restricts oral intake and results in less activity in constrictor muscles of the pharynx. It further increases pain and thus a vicious cycle starts. Effective pain management helps the patient for early resumption of oral intake and thus early discharge from the ward.

Researchers have tried different options for pain reduction after tonsillectomy like use of topical lignocaine^{1,2}, ropivacaine³, pethidine⁴, dexamethasone¹, bupivacaine^{5,6} etc. in addition to systemic use of NSAIDs, narcotic analgesics and steroids. Bupivacaine because of its rapid onset and prolonged action is gaining popularity as an effective method for pain reduction after tonsillectomy. It can be used by local infiltration, topical spray or topical application with a pack in the tonsillar bed. Serious and life threatening complications have been reported by local infiltration of bupivacaine like cardiac arrhythmia, airway obstruction⁷, cervical osteomyelitis⁸, facial nerve paralysis⁹, Horner's syndrome¹⁰ and vocal cord paralysis¹¹.

This study was conducted to determine the efficacy of bupivacaine applied topically through a pack in the tonsillar fossa, in reducing post-operative pain.

METHODOLOGY

This was a multicentric study conducted at Hamdard

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University Hospital, Memon Hospital, Zubaida Medical Centre and Habib Medical Centre, Karachi, over a period of two years from July 2006 to June 2008. Total number of cases included in this study was 205 patients. Inclusion criteria included all consecutive patients undergoing tonsillectomy during the above mentioned period.

Exclusion criteria included tonsillectomy along with adenoidectomy and tonsillectomy for any indication other than chronic tonsillitis like after quinsy or for biopsy purpose etc. Tonsillectomy was done by diathermy technique in all the cases by a uniform method. Tonsil on the right side was removed first and after securing haemostasis a pack soaked in 0.5% bupivacaine solution was put in the tonsillar fossa. Then tonsil on the left side was removed and after securing haemostasis a pack soaked in normal saline was put on the left side. Then after five minutes both the packs were removed. Thus the right side was considered as tested side while the left side acted as a control in this study.

Post-tonsillectomy pain was assessed separately on two sides of the throat on Visual Analog Scale (VAS) from 0 to 10 (where 0 was 'no' pain and 10 was 'severe excruciating' pain). Pain assessment was done at specific time interval of 1, 4, 8, 16 and 24 hours after the surgery and recorded on a performa. Whole data was saved, processed and analyzed on SPSS 11.0.

RESULTS

There were 82 male and 123 female patients with male to female ratio of 2:3. The youngest patient was of 5 years of age and the oldest was 30 years, with mean age of 9.23 years. Majority of the patients (79%) were between age group of 5 to 10 years, 10% between 11 to 15 years, 5% between 16 to 20 years, 4% between 21 to 25 years and 2% between 26 to 30 years of age.

Table I shows different statistical values of pain scores of each side at different time intervals. Mean pain score

on the right side after 1, 4, 8, 16 and 24 hour was 3.23(± 1.03), 3.46(± 0.77), 3.27(± 0.64), 3.57(±0.81) and 5.01(± 1.27) respectively whereas on the left side was 5.55(± 1.34), 4.69(± 1.03), 5.07(± 1.00), 5.27(±0.81) and 5.61(± 1.24) respectively. There was a significant difference between the tested side and the control side (p <0.01) at all time intervals.

Difference of mean pain score between right and left sides at 1st hour was 2.32, at 4th hour 1.23, at 8th hour 1.80, at 16th hour 1.71 and at 24th hour it was 0.60, showing that pain control was very effective at 1st hour but the difference was still present till 24 hours (Fig.1). In addition, no complication, reaction or side effect of bupivacaine was noted in any case in this study.

DISCUSSION

Bupivacaine is a local anaesthetic agent which blocks the generation and conduction of nerve impulses. It presumably increases the threshold for electrical excitation in the nerve, slows propagation of nerve impulses

Fig. 1. Graph showing mean pain score on Right and Left at different time interval

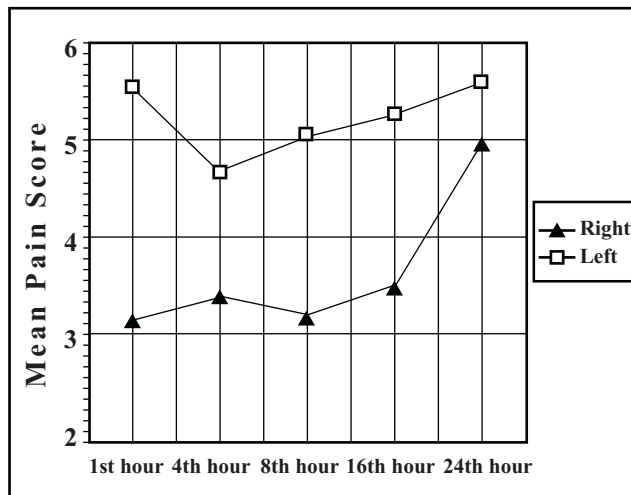


Table I. Statistical values of pain score at difference time interval

	1st Hour		4th Hour		8th Hour		16th Hour		24th Hour	
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
Mean Pain Score	3.23	5.55	3.46	4.69	3.27	5.07	3.57	5.27	5.01	5.61
Standard Deviation	1.03	1.34	0.77	1.03	0.64	1.00	0.81	0.95	1.27	1.24
Difference of Mean Pain Score	2.32		1.23		1.80		1.71		0.60	
P-Value	< 0.01		< 0.01		< 0.01		< 0.01		< 0.01	

and reduces rise of action potential. Its action depends upon the diameter, myelination and conduction velocity of the nerve. Clinically order of loss of nerve function is first pain, then temperature, then touch, then proprioception and lastly skeletal muscle tone. Bupivacaine is widely used for local and regional anaesthesia for surgery, obstetrics, diagnostic and therapeutic procedures etc. Many studies had been conducted on bupivacaine for reducing pain after tonsillectomy operation where it is used by local infiltration, spray or topical packing in the tonsillar bed. But there is still controversy in its effectiveness for reducing pain and regarding its complication. Some studies strongly support its effectiveness in tonsillectomy^{12,13}, but some studies shows that it has no significant role in reducing pain in every patient^{14,15}.

Pain is a complex subjective sensation which is very difficult to measure and it varies from person to person. That is why in our study we did experimental intervention on one side whereas the other side acted as its own control. Visual analog scale (VAS) was chosen for pain score as it is deemed one of the most accurate and reproducible pain scales. We have used ribbon gauze soaked in bupivacaine solution to be kept in the tonsillar fossa for 5 to 10 minutes after tonsillectomy. This method of topical application of bupivacaine is very safe as compared to infiltration of bupivacaine in the tonsillar bed. Serious and life threatening complications had been reported after bupivacaine infiltration.⁷⁻¹¹ In this study no complication occurred due to use of bupivacaine.

Onset of action of bupivacaine is rapid and anaesthetic effect lasts for many hours. In this study effect of bupivacaine was very significant at first hour (Table I and Fig.1). There was also significant difference at 4th, 8th and 16th hours. At 24th hour, the difference of mean pain score on the two sides is although less but still the difference is apparent, demonstrating the efficacy of bupivacaine remains till 24 hour after single application.

CONCLUSION

In the end, it is concluded that topical application of bupivacaine pack in the tonsillar fossa is an effective method to reduce pain after tonsillectomy. It is a safe method and no complication is associated with this technique. Pain reduction is seen in immediate post-operative period which remains for a long time up to 24 hours after surgery.

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