The Effect of Topical Bupivacaine in Post Tonsillectomy Pain Relief

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Abstract :

Introduction : Tonsillectomy is one of the most commonly performed operations in the world and is accompanied by severe pain postoperatively. Bupivacaine, a long-acting local anaesthetic, is commonly used for post tonsillectomy pain relief but its usefulness remains uncertain. **Objectives :** To study the efficacy of topical Bupivacaine in post tonsillectomy pain relief among two groups of patients using the visual analogue score (VAS). **Methodology :** This study was done on 74 patients who underwent tonsillectomy. Patients were divided into group A in which topical Bupivacaine was used and group B in which topical Bupivacaine was not used. A comparison of visual analogue score (VAS) was done among the two groups at 1 hour, 4 hours, 8 hours and 24 hours postoperatively. **Results :** 74 patients aged 8 years and above were recruited for this study. Mean VAS for group A was 6.22(±1.01) at 1 hr, 6.63(±1.17) at 4 hrs, 5.22(±1.30) at 8hrs, 4.73(±1.19) at 24 hrs. Mean VAS for group B was 6.48 (±1.23) at 1 hr, 6.72(±1.84) at 4 hrs, 4.88(±1.51) at 8hrs, 4.48(±1.39) at 24hrs. **Conclusion :** No statistically significant benefit was found by the use of topical Bupivacaine in post tonsillectomy pain relief among the two groups of patients.

Key Words : Bupivacaine, Tonsillectomy,Visual Analogue Score

Introduction :

Tonsillectomy is one of the most commonly performed operations in the world and is accompanied by severe pain postoperatively. [1] Managing pain following tonsillectomy remains a challenge for the anaesthetist and the treating surgeon as it impairs swallowing, which subsequently leads to infection, dehydration and secondary haemorrhage.[2]Several different treatment techniques for pain have been developed for use during and after surgery, including steroids, analgesics, antibiotics, and anti-nausea medications, and have been shown to have some positive outcomes in randomized trials.[3]There are different ways of using local anaesthetics which include: pre-incisional peritonsillar infiltration, post-tonsillectomy wound infiltration and post-tonsillectomy packing with soaked gauze.[2] Bupivacaine, a long-acting local anaesthetic, is the most commonly reported local anaesthetic for paediatric regional anaesthesia by virtue of its lower toxic threshold compared with other local anaesthetics.[4,5] Various studies have argued the effectiveness of topical application of 0.5% Bupivacaine in reducing postoperative pain with conflicting results.[6,7] This study was done to compare the effect of topical Bupivacaine among two group of patients who underwent tonsillectomy with and without the use of Bupivacaine.

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Material and Method :

74 patients, aged 8 years and above were recruited in this randomized clinical study. All patients had attended an otolaryngology outpatient clinic with a history of recurrent tonsillitis. Patients with known allergy to Bupivacaine, bleeding disorders, and those with painful conditions of the oropharynx like peritonsillitis and peritonsillar abscess or those with significant co morbidities were excluded. Patients were enrolled between January 2012 and February 2015.Written informed consent was taken from the patients/ parents and approval for this study was obtained from the local ethical committee. The minimum cut off age was 8 years and only patients who were intelligent and articulate enough to interpret the visual analogue scale (VAS) were included. All patients were instructed on how to complete a VAS before surgery. The Visual Analogue Pain Scale is a simple assessment tool consisting of a 10 cm line with 0 on one end, representing no pain, and 10 on the other, representing the worst pain ever experienced. The VAS pain scale has been found to be reliable and easily used in a number of clinical and experimental studies. [8]

A standard anesthetic protocol was followed for the study patients and consisted of the following: Premedication with Injection Glycopyrrolate and Fentanyl. Induction was done with Injection Propofol and Scoline and maintained with O_2, N_2O and Isoflurane or Sevoflurane. Myorelaxation was achieved with Vecuronium or Atracurium and reversal done with Glycopyrrolate and Neostigmine.

The tonsillectomy was performed by a standardized blunt dissection and snare technique. Bleeding was controlled by bipolar diathermy. All patients were randomized into group A in which topical Bupivacaine was used postoperatively and group B in which no Bupivacaine was used. Gauze pieces soaked in 5 ml of 0.5% Bupivacaine were placed in both tonsillar fosse of the Group A patients for five minutes before extubation.Post operatively patients' pain scores were assessed by means of a VAS at fixed intervals at 1, 4, 8, and 24 hours after extubation. Patients were blinded to their previous VAS scores. Patients were given a new VAS at each testing interval and were instructed to mark on the line the approximate level of their pain at that moment. The VAS score was recorded by the on duty nursing staffs who were blinded to the study. Postoperative analgesia was divided into regular medication and rescue analgesia. Regular medication was started 6 hours after premedication and consisted of single dose of injectable i.v. Diclofenac in its aqueous form followed by oral Ibuprofen and acetaminophen every 8 hourly. The rescue analgesia was administered by nursing staff as needed in patients with a VAS score more than 7, over and above the routine analgesic and consisted of another dose of iv Diclofenac. Every additional dose of rescue analgesia administered was recorded by the nursing staff. The statistical analysis was performed using SPSS-10 software. Pain scores using VAS were documented as mean ± standard deviation (SD). Student's paired t-test was used for calculating p-values. A p-value of < 0.005 was considered significant.

Results :

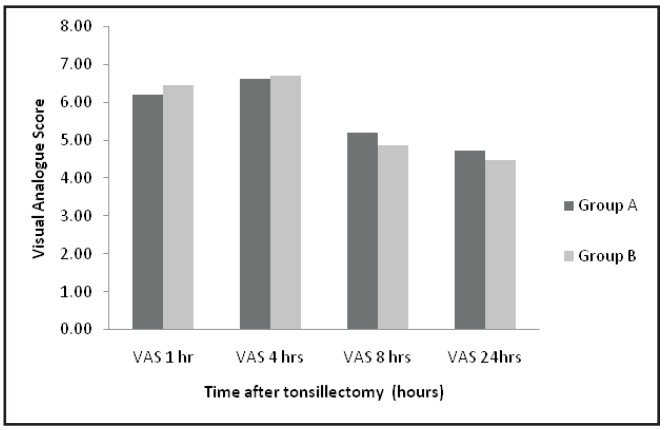
Of the total 74 patients studied, 50 patients were in group A in which topical Bupvacaine was used and 24 patients were in group B group in which Bupivacaine was not used. The study groups were comparable with respect to age, weight and sex. The mean age of the patients was19.08(±12.11) for group Aand 18.28 (±8.81) for group B. Percentage of male v/s female was, 56.3% v/s 43.7% in group A and 54.2% v/s 45.8% in group B. Table 1 shows mean pain score ±SD and p value at 1 hour, 4 hours, 8 hours and 24 hours postoperatively, among group A and Group B patients. Mean VAS for group A was 6.22(±1.01) at 1 hr, 6.63(±1.17) at 4 hrs, 5.22(±1.30) at 8hrs, 4.73(±1.19) at 24 hrs. Mean VAS for group B was 6.48 (±1.23) at 1 hr, 6.72(±1.84) at 4 hrs, 4. 88(±1.51) at 8hrs, 4.48(±1.39) at 24hrs.

Table 1: Pain score (VAS) (Mean±SD) postoperatively among Group A and Group B patients

Group	1 hour	4 hours	8 hours	24hours
Group A	6.22 ±1.01	6.63 ±1.17	5. 22 ±1.30	4.73 ±1.19
Group B	6.48 ±1.23	6.72 ±1.84	4. 88 ±1.51	4.48 ±1.39
P value	0.34	0.84	0.31	0.41

Though the VAS score for pain sensitivity was marginally lower in group A patients at 1 hr and 4 hrs (Graph 1) there was no statistical significance, (P=0.34 at 1hr, 0.84at 4 hrs, 0.31 at 8 hrs and 0.41 at 24 hrs)

Figure 1 : Comparison of mean VAS between two groups



Requirement for rescue analgesia was slightly higher in Group B patients (16.66%) as against Group A patients (10%). There was however no statistical significance. No patient suffered any adverse effect due to topical application of Bupivacaine.

Discussion :

Pain is a subjective and complex expression, and its assessment depends on personal experience, social and ethnic factors, and anxiety level as well as the patient's

ability to describe the type and degree of pain on the basis of some frame of reference. [9] Pain following tonsillectomy has been poorly measured, one of the reasons for it being that a large number of patients undergoing tonsillectomy are of pediatric age group and due to variety of unequivocal methods available, accurate measurement of pain has been difficult. [10, 1]

The reduction of post-tonsillectomy pain is important not only for the patient comfort, but also because reducing pain improves oral intake, reduces the risk of dehydration, infection and post surgical haemorrhage.[11] Many techniques have been discussed to relief postoperative pain in tonsillectomy patient including surgical and medical. Bupivacaine infiltration has been used as pre-emptive method of relieving post operative pain by blocking nociceptive impulses from entering the central nervous system. Bupivacaine as well as other local analgesics act via inhibiting stimulation of fiber-c afferent neurons resulting in decreased stimulation of dorsal horn neurons of spinal cord. [12]

Our study failed to demonstrate the beneficial effect of topical Bupivacaine in post tonsillectomy pain relief at 1, 4, 8 and 24 hours. This is similar to the findings of the intraindividual study by Hydri et al[2] in which an appreciable pain relief could not be demonstrated in the tonsillar fossas in which topical Bupivacaine was used. Our study is also consistent with the findings of Kountakis et al. [13] Nordahl et al. [14] Strub et al[15] and Orntoft et al.[16] in which no correlation between infiltration of Bupivacaine and pain after tonsillectomy could be demonstrated . Our findings are however in contrast to the findings of Hung et al.[17] whose study demonstrated that eating and drinking were started sooner and postoperative pain was lower at 1, 3, and 6 hours postoperatively in the case group whose tonsillar fossas were treated with cotton dipped in Bupivacaine. Studies carried out by Wong et al [18] and Stuart et.al[19] suggested that peritonsillar infiltration of Bupivacainewas moderately useful as a mean of providing post – operative pain relief in children undergoing tonsillectomy. Johansen et al.[20] evaluated 26 patients in 1996. They injected 5ml of 0.25% Bupivacaine solution in the case group and equal amount of normal saline in the control group. Afterwards, they assessed the pain after surgery by visual analogue score (VAS) and compared the efficacy of oral analgesic after surgery between the two groups. Findings were consistent with less pain and lower use of analgesics in the case group ($p<0.001$) but the study population were not enough. [20]

There are a multitude of studies both supporting and refuting the effectiveness of Bupivacaine. Hence the usefulness of Bupivacaine in post tonsillectomy pain relief remains equivocal. Moreover, the use of Fentanyl as a premedication may have masked the beneficial effect of topical Bupivacaine in the immediate post operative period. More intra individual studies with a larger sample size should be done to establish topical Bupivacaine as an effective analgesic in the management of post tonsillectomy pain.

Conclusion :

No statistically significant benefit was found by the use of topical Bupivacaine in post tonsillectomy pain relief.

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