

THE EFFECT OF PERITONSILLAR INFILTRATION WITH MEPECAINE-L ON TONSILLECTOMY MORBIDITY IN ADULTS

Ali J Auda^{*}, Ahmed A Alansary[#] & Abdulwahab B Abdulwahab[@]

^{*}MB,ChB, CABS, ENT Dept, Basrah General Hospital. [#]MB,ChB, FICMS, Consultant Otolaryngologist, Head-ENT Dept, Basrah General Hospital. [@]MB,ChB, FICMS, ENT Specialist, ENT Dept, Basrah General Hospital.

Abstract

Tonsillectomy is one of the most common performed procedures in ENT practice, it may be associated with bleeding and postoperative throat pain which are significant morbidities.

The aim of this study is to evaluate the effects of peritonsillar infiltration with (Mepecaine-Levonottrdefrin) on tonsillectomy duration, intraoperative blood loss and early post-operative pain in adults.

In this case-control study; fifty adults aged between 18-32 year were included, they were 34 females and 16 males who underwent tonsillectomy in the period between November 2011 and April 2012 at Basrah General Hospital, Iraq. Unilateral peritonsillar injection with Mepecaine-L (Mepecaine 2% - Levonorderfrin 1:20000) were infiltrated to one side and compared with the other side for the following parameters: operation duration, intraoperative blood loss and early post-operative pain score.

There was no statically significant difference in the duration of operation between the test and control side ($P>0.05$); There was significant reduction in the blood loss in the tested side ($P<0.001$); and also significant reduction of the early postoperative pain ($P<0.001$). No significant intraoperative or postoperative complications were noticed.

In conclusion, the use of peritonsillar infiltration with Mepecaine-L before tonsillectomy is a safe and effective method that significantly reduces the blood loss and relieves the pain in adults after tonsillectomy.

Introduction

Tonsillectomy is one of the most frequently performed procedures in the E.N.T departments. The procedure is performed with or without adenoidectomy for recurrent tonsillitis or obstruction of the upper airway¹.

Tonsillectomy is often associated with perioperative bleeding and postoperative severe pain; in addition, patients frequently have nausea, emesis and abdominal discomfort^{1,2}. Therefore different studies have investigated many methods to reduce these morbidities like the use of dexamethasone, bupivacaine; ropivacaine and local lidocaine spray^{1,3}.

During surgery, pain impulses entering the central nervous system, create a hyperexcitable state in spite of general anaesthesia. Blockade of these impulses

by preoperative analgesic drugs infiltration or topical administration of local anesthetic agents has a preemptive analgesic effect. Post-tonsillectomy pain is probably the result of muscle spasm caused by inflammation and irritation of the pharyngeal musculature. Injection or topical administration of a local anesthetic agent is believed to decrease pain by producing pharmacologic blockade of the sensory pathways before surgery, thus preventing the nociceptive impulses from reaching the spinal cord^{1,2,4-6}.

Mepivacaine hydrochloride, a tertiary amine, is one of the most clinically useful local anesthetic of the amide group. It is similar in its local anesthetic potency to lidocaine, but may produce more rapid

onset of action and more prolonged effect⁷. It acts by decreasing action potential phase of the exciting nerve⁷. The lowest dose that results in effective anesthesia should be used to avoid high plasma levels and possible adverse effects. The maximum dose for adults is 400mg. its duration of analgesia will lasts for approximately 3-4 hours. It should use with caution in patients who have allergy to amide s, liver and renal problems. The adverse effects of Mepecaine-L are on the central nervous system and the cardiovascular systems usually result from high plasma levels due to excessive dosage, rapid absorption, or inadvertent intravascular injection, and rarely anaphylactic reactions. In case of overdose, one must secure and maintain patient's airway and supporting ventilation, improvement of cardio-circulatory status and anti-anaphylactic measurements⁷⁻⁹.

Patients & Methods

In this case-control study, fifty tonsillectomy cases were performed in the E.N.T department of Basrah General Hospital, Iraq; in the period between November 2011 and April 2012, all patients were adults aged between 18 and 32 years and they were 16 males and 34 females. All patients admitted for elective tonsillectomy due to recurrent or chronic tonsillitis and all procedures were performed under general anesthesia. Tonsils were removed by cold-steel dissection technique and all procedures were performed by the same surgeon, this proceeded by full otolaryngological evaluation for all patients. One tonsil was the test i.e. the infiltrated side, and the

other was the control i.e. the none infiltrated side; the side of the test was randomly selected (if we were selected the right side as tested side in the first operation; the left tonsil was selected in the next operation and so on). Patients with potentially complicated medical disorders as those with blood dyscrasia, malignancies, diabetes, hypertension; patients underwent tonsillectomy for obstructive sleep apnea, and patients under chronic analgesic treatment or who had received any analgesic drug during the last 7 days before surgery were all excluded from the study.

Informed consent was taken from all patients enrolled in this study. At the beginning we started to weigh the dry gauze and the empty sucker containers that will be used during the operation separately; using sensitive electronic digital scale. All the operations were done under general anesthesia; with orotracheal intubation; The anesthesiologist performed general anesthesia to all patients by using midazolam 0.1mg/kg, then induction with either propofol 2mg/kg or thiopental 3-5mg/kg, and maintenance with halothane or isoflurane in oxygen inhalation plus either atracurium 0.5mg/kg or pancrorium 0.07mg/kg. Monitoring including electrocardiography, noninvasive blood pressure measurement, pulse oximetry to measure peripheral oxygen saturation (SpO₂). All patients underwent tonsillectomy in a classical cold-steel dissection method. The test side infiltrated with 1.8 ml (34mg) of Mepecaine-L 2% and Levonorderfrin 1:20000 carpule using dental syringe (Figure 1).

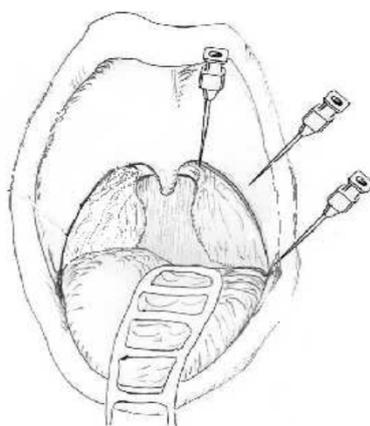


Figure 1: Peritonsillar infiltration in 3 points; the upper, middle & lower aspects

At first we start to dissect and hemostat the control side and after achieving a complete homeostasis, the duration of operation on the control side was calculated by using a digital timer. The assistant nurse was asked then to collect the blood wetted gauze and the rotary nurse was asked to change the sucker container. The same procedure was repeated on the test side after achieving a complete homeostasis. The blood in the sucker container plus that in the gauze was weighed by using a sensitive electronic digital scale (Figure 2). After that, the blood in grams were converted to milliliters according to the following law: The average density of human blood is about 1060 grams per liter, one milliliter will be 1/1000th of that, or about 1.06 grams¹⁰. The exact amount of the blood was recorded by the extraction of the first result from the later one.



Figure 2: Instruments used in the study includes electronic scale, dental syringe, Mepecaine-L carpule and sucker containers.

Assessment of the pain was done by using the numerical pain rating scale¹¹, each patient instructed to rate his pain by a number between zero and ten for the first twelve hours post operatively; when zero represents no pain and ten represents the worst possible pain. All patients stayed in the ward overnight and they received acetaminophen tablets 500mg three times a day for pain management and injectable Ampicillin-cloxacillin 500mg every six hours intravenously. No intra or postoperative complications or drug adverse effects were noticed. Statistical analysis of data done by using Chi square and T-tests. Probability value (P) <0.05 was considered significant.

Results

In this study, 50 adult patients scheduled for tonsillectomy were randomly selected. Their ages ranged from 18 to 32 year. They were 34 females (68%) and 16 males (32%) with M:F ratio was 1:2.1 as shown in figure 3.

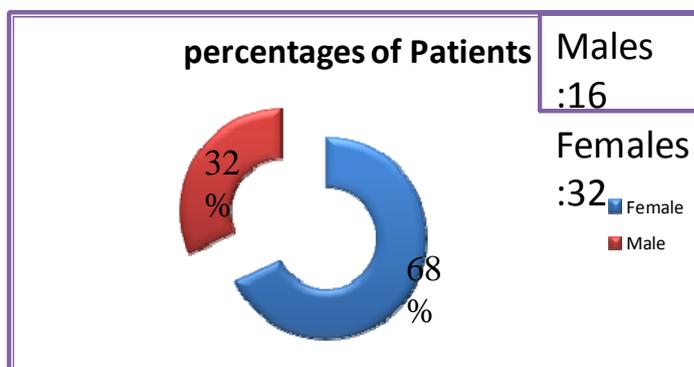


Figure 3: Gender distribution of the 50 patients included in the study.

The duration of surgery was 7.05min and 7.38min for the test and control side respectively; there is no statistical difference between them ($P>0.05$) as seen in figure 4.

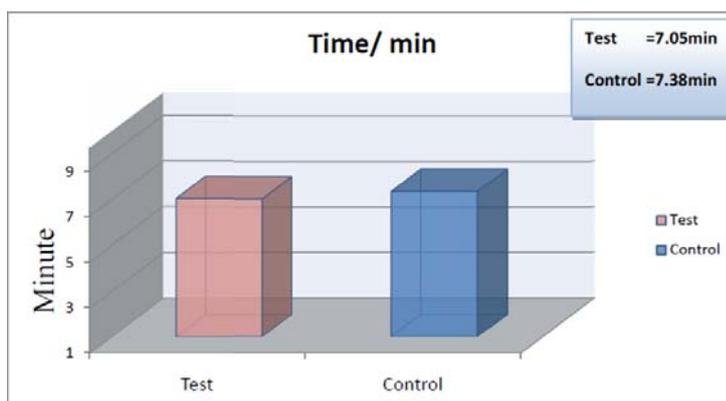


Figure 4: The duration of surgery $P>0.05$

The blood loss during surgery was 45.20ml and 74.15ml for the test and control side respectively; this result is statistically significant ($P<0.001$) as showed in figure 5.

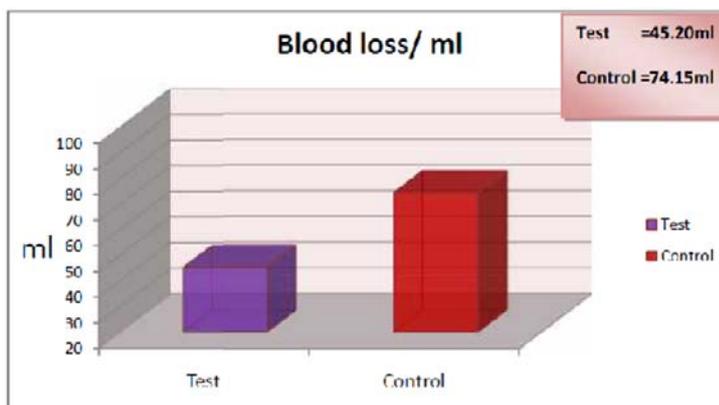


Figure 5: Blood loss during surgery $P<0.001$

The postoperative numerical pain scale was 5.16/10 for the test and 6.52/10 for the control side; this result is statistically significant ($P < 0.001$) as seen in figure 6 ($P < 0.001$).

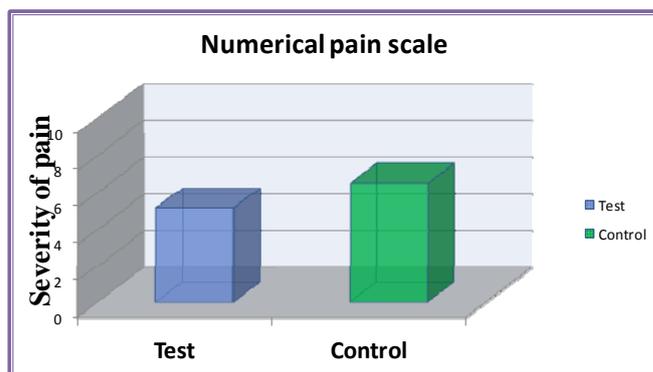


Figure 6: The numerical pain scale

Discussion

Tonsillectomy is a common surgical procedure associated with significant intraoperative bleeding and post-operative pain that is difficult to control. Inadequate pain management after tonsillectomy may result in a poor oral intake, dehydration, sleep disturbances, behavioral changes, emesis and late hemorrhage¹².

Various surgical and pharmacological strategies have been undertaken in an effort to control hemorrhage during cold steel dissection tonsillectomy ranging from the application of adrenaline soaked gauze pressure packs on the tonsillar fossa, the use of diathermy and ligatures of the bleeding vessels to newer methods like the use of the Ligasure Vessel Sealing System (LVSS) and the Ankaferd Blood Stopper¹³.

On the other hand, several strategies have been undertaken to reduce post-tonsillectomy pain¹³. One of these strategies is the use of Opioids although opioids may provide sufficient analgesia, they are associated with respiratory depression, which can be detrimental to the patient with obstructive airway disease, in addition to that, opioids are associated with an increased incidence of post-operative nausea and vomiting^{4,12}.

Another strategy is the use of anti-inflammatory drugs which inhibit the synthesis of prostaglandins at both the

cyclo-oxygenase (COX)-1 and COX-2 sites, but their use has been associated with risk of bleeding in the tonsillectomized patients¹⁴.

The injection or topical administration of a local anesthetic agent is believed to decrease pain by producing pharmacological blockade of the sensory pathways before surgery, thus preventing the nociceptive impulses from reaching the spinal tract^{1,3,5,13}.

There are numerous studies that favor the use of local anesthetic drugs to reduce post tonsillectomy pain. The local anesthetic drug is usually applied by infiltration. Jebeles et al¹⁵ demonstrates that bupivacaine with epinephrine infiltration decreased post tonsillectomy pain for about 10 days post-operatively. Goldsher et al¹⁶ also reported a decrease in pain after tonsillectomy with bupivacaine infiltration. Somdas et al¹⁷ also found that bupivacaine infiltration was effective.

In this study, we evaluated the effect of peritonsillar infiltration with Mepeccaine-L on tonsillectomy morbidity in adults. We preferred this local anesthetic drug in this study, because of the limited data in the literature about its use in adults tonsillectomy cases for the reduction of intraoperative bleeding and early post-operative pain. This study shows a statically significant reduction in blood

loss during the operation; which was near the finding of Waldemar Trolle Sørensen¹⁸, who showed that Low-dose injection of lidocaine–adrenaline before tonsillectomy was highly significant with more than 50% reduction in perioperative blood loss in the infiltrated side; and to Lynn M. Broadman MD¹⁹, who showed that infiltration of the peritonsillar space with lidocaine 2%, epinephrine (1:200,000) was shown to be more effective in reducing blood loss than infiltration with normal saline.

In this study; there was significant reduction in the early postoperative pain; and this result goes with the finding of Kasapoglu Fikret²⁰, who suggested that Preincisional peritonsillar infiltration with levobupivacaine or bupivacaine before tonsillectomy, are more effective than saline, in reducing early post-tonsillectomy pain. On the other hand, the results were different from that of E. Egelia²¹ who suggests that the application of topical lidocaine with adrenaline seems to offer no advantage over placebo in the control of postoperative pain and other

morbidity related factors following tonsillectomy, probably may be due to the use of non-standardized methods during anesthesia and operation.

In the current study; there is no significant reduction in the operative time after peritonsillar infiltration with Mepecaine-L; this may be due to that the drug affects the small blood vessels leading to drier field dissection but still the bleeding from larger blood vessels which needs to be ligated to achieve good homeostasis which is time consuming.

In conclusion, it has been seen that peritonsillar infiltration with Mepecaine-L is a safe and effective method in reducing intraoperative blood loss and early post-operative pain, however, it has no significant reduction on the duration of operation.

From this study findings we recommend the followings: using Mepecaine-L peritonsillar infiltration in tonsillectomy in adults to decrease its morbidity, further studies needed on the role of Mepecaine-L peritonsillar infiltration and its safety in children.

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