Effect on postoperative pain after topical application of local anesthetics in the tonsillar fossa after tonsillectomy

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Background
Tonsillectomy is one of the most commonly performed surgeries in ENT practice. Despite improvements in anesthetic and surgical techniques, post-tonsillectomy morbidities continue to be a significant clinical concern. Pain is the cause of most of the postoperative morbidity after tonsillectomy. An effective pain therapy to block or modify the physiological responses to stress has become an essential component of modern pediatric anesthesia and surgical practice.
Aim
The present study compares the results between the effect of lidocaine 2% infiltration, lidocaine 10 % spray, and bupivacaine 0.5% spray in the tonsillar bed after tonsillectomy on postoperative pain.
Materials and methods
The study included a total of 120 patients aged 5–18 years who were candidates for tonsillectomy at the Otorhinolaryngology Department of Alexandria Main University Hospital. The patients were randomly divided into three groups of 40 patients each. Group A received lidocaine 2% (Xylocaine) peritonsillar infiltration 2 ml in one tonsillar bed and posterior pillar; group B received lidocaine 10% (Xylocaine) spray 2 puff in one tonsillar bed; group C received bupivacaine 0.5% (Marcaine) solution 2 ml in one tonsillar bed spray by syringe and the other tonsillar bed in each group receives pack with similar amounts of normal saline for 5 min as a control group after tonsillectomy before recovery from anesthesia.
Results
There was no statistical difference between the three studied groups as regards age and sex. There is significant statistical difference according to the frequency of throat pain and ear pain by comparing cases and controls of each group within the first 24 h after surgery. It appears that increased frequency of postoperative throat pain and ear pain is present with the control side (saline).
Conclusion
Topical application of the tonsillar bed with a local anesthetic after tonsillectomy results in significant reduction of postoperative throat pain and referred otalgia and should be used during surgery for tonsillectomy.

Keywords:
anesthetics, local, pain, postoperative, tonsillectomy

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Introduction

Tonsillectomy is considered to be the most common surgery in ENT practice. There are a number of absolute and relative indications but practically the most common indications for performing this surgery are recurrent tonsillitis and obstructive sleep apnea.

Various techniques have been used to perform this surgery; however, dissection and ligation of the superior and inferior poles remains the most commonly used method [1,2].

Despite improvements in anesthetic and surgical techniques, post-tonsillectomy morbidities continue to be a significant clinical concern [3,4].

Pain is the cause of most of the postoperative morbidity after tonsillectomy. Pain is an unpleasant emotional experience associated with potential tissue damage and interfere with normal daily activity and work [5].

An effective pain therapy to block or modify the physiological responses to stress has become an essential component of modern pediatric anesthesia and surgical practice [6].

Pain in the throat restricts oral intake and results in less activity of the constrictor muscles of the pharynx and predispose to bleeding secondary to infection [7].

Postoperative pain is variable regardless of the differences in technique (e.g. cautery, laser, or dissection) and different anesthetics, either local anesthetic (LA) or general anesthetics (GA) where it is least in surgical dissection and ligation method and most in laser and monopolar cautery [8–13].

Relief of pain after tonsillectomy is thus a major concern to allow the patient to proper feeding and to avoid other complications.

Recent experimental data, in both humans and animals, suggest that, even during surgery under GA, pain impulses from peripheral nerve stimulation travel into the central nervous system (CNS) [14].

The physiological changes in the CNS lead to the formation of a neural hyperexcitable state, resulting in the prolongation of postoperative pain [14].

Blockade of peripheral nerve pain impulses to the CNS during surgery should prevent formation of this hyperexcitable state and, subsequently, results in reduction of postoperative pain [15].

Researchers have tried different options for pain reduction after tonsillectomy like use of topical lignocaine, ropivacaine, pethidine, dexamethasone, and bupivacaine [16–20].

Both lidocaine and bupivacaine are of the amide group of LAs [21].

Local and regional anesthesia and analgesia techniques depend on a group of drugs—LAs—that transiently inhibit sensory, motor, or autonomic nerve function, or a combination of these functions, when the drugs are injected or applied near neural tissues.

Lidocaine (Xylocaine; Astra Zenka, Sodertalje, Sweden) is a common LA agent which is widely applied. It is available in many concentrations such as 0.5, 1, 1.5, 2, 4, 5, and 10%. Its maximum dose is 4.5 mg/kg (without epinephrine), 7 mg/kg (with epinephrine). Above that dose, it is toxic. Its onset of action within 2 min and its duration of action extends up to 180–300 min (3–5 h) [22].

Bupivacaine (Marcaine) because of its rapid onset of action and prolonged duration is gaining popularity as an effective method for pain control after tonsillectomy [23,24].

It is preferred to be used by a pack or spray by a syringe on tonsillar bed as its infiltration sometimes cause serious complications such as facial nerve paralysis, Horner's syndrome, vocal cord paralysis, cardiac arrhythmia, and cardiac arrest. Bupivacaine is also used in spinal, epidural anesthesia, and in peripheral nerve block [25–29].

It is available in 0.25, 0.5, and 0.75% concentrations. Its maximum dose is 3 mg/kg. Above that dose, it is toxic. Its onset of action within 5 min and it duration of action extends up to 270–720 min (4.5–12 h) [22].

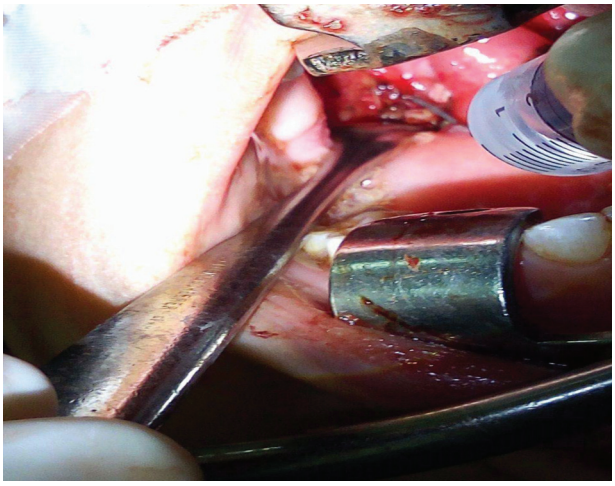
Materials and methods

It is a prospective, cohort study that was conducted to collect data that included 120 patients aged 5–18 years who underwent tonsillectomy at the Otorhinolaryngology Department of Alexandria Main University Hospital.

Patients who undergo tonsillectomy were randomly divided into three groups:

(1) Group A: consists of 40 patients who received lidocaine 2% (Xylocaine) peritonsillar infiltration 2 ml in one tonsillar bed and posterior pillar intraoperatively (Fig. 1).
(2) Group B: consists of 40 patients who received lidocaine 10% (Xylocaine) spray 2 puff in one tonsillar bed intraoperatively.
(3) Group C: consists of 40 patients who received bupivacaine 0.5% (Marcaine) solution in one tonsillar bed spray by a syringe intraoperatively and the other tonsillar bed in each group receives pack with similar amounts of normal saline for 5 min as a control group. Before infiltration

Figure 1



Lidocaine 2% infiltration (1 ml) in the posterior pillar.

bending of the needle tip (angulated) is done for better visualization during infiltration (Fig. 2).

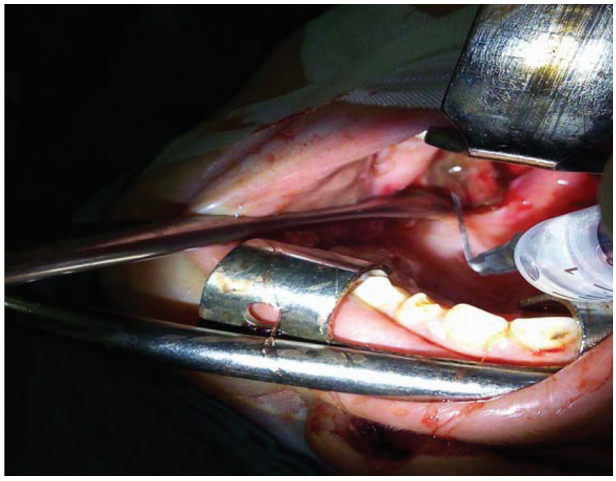
All patients received these medications soon after excision of tonsils before recovery from GA.

All patients in all groups had the same premedication and anesthetic technique.

During the operation, no analgesia other than the study materials was given.

From the first day post-tonsillectomy, an antibiotic (amoxicillin clavulanic acid 600 mg suspension in a dose of 90 mg/kg/12 h was given to all patients in all groups and no analgesia was given in the first day.

Figure 2



Bupivacaine 0.5% solution (2 ml) spray by syringe in the tonsillar bed.

From the second day post-tonsillectomy, paracetamol syrup in a dose of 15 mg/kg/6 h was given as an analgesic to all patients in all groups.

Follow-up was done immediately postoperatively and after 1, 4,8, 16, and 24 h after surgery. All patients were discharged home on the same day of surgery. The follow-up data was collected by the nursing parent using a printed out questionnaire using 10 mm visual analog scale 0–10 assessing pain, and then it is analyzed, and the three groups were compared.

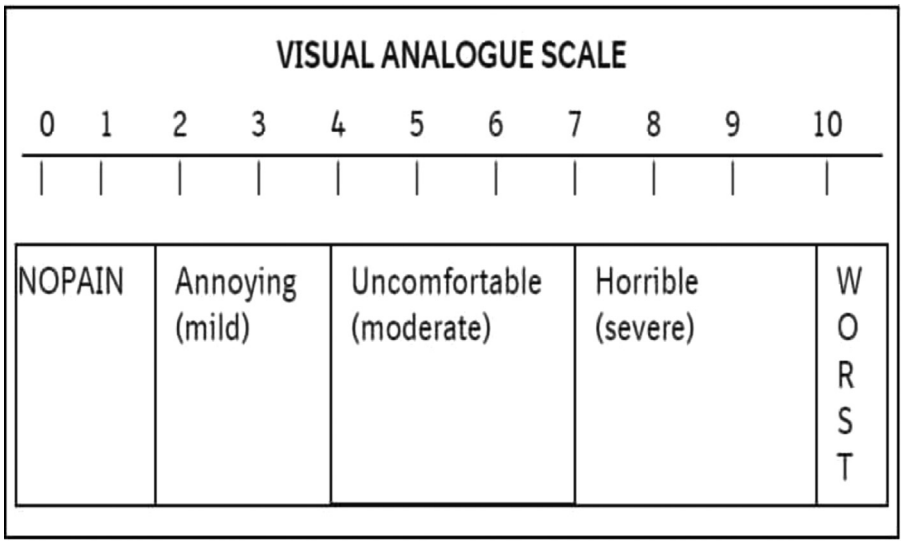
The recorded outcome was done by assessing the presence of pain immediately postoperatively after recovery from GA and by using a questionnaire that is given to the nursing parent on discharge to fill in the degree of post-tonsillectomy pain according to VAS and referred otalgia; it was discussed and explained in detail to the parents as to how to fill it.

Post-tonsillectomy pain was assessed using VAS from 0 to 3 (where 0 'no pain' and 3 'severe excruciating pain'). Pain assessment was done at specific time intervals of 1, 4, 8, 16, and 24 h after surgery.

It is a simplified form from the original scale where '0' is no pain and '10' is severe excruciating pain (Fig. 3) [30].

An informed consent form was taken from all parents. All information was collected from patients' relatives. The nature of the research study and its benefits were properly explained to them. Parents were instructed to administer their children the prescribed medications in

Figure 3



Visual analogue scale.

the right dose and to give the appropriate amounts of foods and fluids.

Our purpose was to determine which method of local anesthesia is better than the other, is it lidocaine 2% infiltration or lidocaine 10% spray or bupivacaine 0.5% spray, regarding the postoperative relief of pain and the duration of analgesia.

Results

Demographic data

Age

The mean age of all groups was 16.63±0.68 with a median of 12. Group A ages ranged from 6 to 18 years with a mean of 16.6±0.69 years, 26 patients were less than 11.5 years and 14 patients were greater than 11.5 years. In group B ages ranged from 5 to 17 years with a mean of 16.5±0.65, 28 patients were less than 11.5 years and 12 patients were greater than 11.5 years. And in group C ages ranged from 5 to 18 years with a mean of 16.8±0.7 years; 26 patients were less than 11.5 years and 14 patients were greater than 11.5 years. There was no statistically significant difference between the three groups as regards age (P=0.138). Thus, there was no age bias.

Sex

In group A there were 26 (65%) men and in group II 13 (32.5%) and in group III there were 19 of

Table 1 Comparison between the two studied groups according to ear pain with lidocaine 2% infiltration in group A

Ear pain	Cases (n=40) [n (%)]	Control (n=40) [n (%)]	χ^2	P
Postoperative	0.25±0.54	0.78±0.92		
No pain	32 (80.0)	19 (47.5)	9.703*	^{MC}P=0.014*
Mild pain	6 (15.0)	14 (35.0)		
Moderate pain	2 (5.0)	4 (10.0)		
Severe pain	0 (0.0)	3 (7.5)		
1 h	0.35±0.70	0.78±0.86		
No pain	31 (77.5)	18 (45.0)	11.519*	^{MC}P=0.005*
Mild pain	4 (10.0)	15 (37.5)		
Moderate pain	5 (12.5)	5 (12.5)		
Severe pain	0 (0.0)	2 (5.0)		
4 h	0.25±0.44	0.78±0.86		
No pain	30 (75.0)	20 (50.0)	13.053*	0.001*
Mild pain	10 (25.0)	9 (22.5)		
Moderate pain	0 (0.0)	11 (27.5)		
Severe pain	0 (0.0)	0 (0.0)		
8 h	0.30±0.46	0.83±0.90		
No pain	28 (70.0)	20 (50.0)	15.649*	<0.001*
Mild pain	12 (30.0)	7 (17.5)		
Moderate pain	0 (0.0)	13 (32.5)		
Severe pain	0 (0.0)	0 (0.0)		
16 h	0.40±0.50	0.65±0.86		
No pain	24 (60.0)	24 (60.0)	14.545*	0.001*
Mild pain	16 (40.0)	6 (15.0)		
Moderate pain	0 (0.0)	10 (25.0)		
Severe pain	0 (0.0)	0 (0.0)		
24 h	0.63±0.49	0.70±0.82		
No pain	15 (37.5)	21 (52.5)	17.270*	^{MC}P<0.001*
Mild pain	25 (62.5)	10 (25.0)		
Moderate pain	0 (0.0)	9 (22.5)		
Severe pain	0 (0.0)	0 (0.0)		

χ^2, P: χ^2 and P values for χ^2 test for comparing between the two groups. ^{MC}p: P value for Monte Carlo for χ^2 test for comparing between the two groups. *P≤0.05, statistically significant.

Table 2 Comparison between the two studied groups according to ear pain with lidocaine 10% spray in group B

Ear pain	Cases (n=40) [n (%)]	Control (n=40) [n (%)]	χ^2	^{MC}P
Postoperative	0.23±0.42	0.58±1.06		
No pain	31 (77.5)	29 (72.5)	8.427*	0.022*
Mild pain	9 (22.5)	4 (10.0)		
Moderate pain	0 (0.0)	2 (5.0)		
Severe pain	0 (0.0)	5 (12.5)		
1 h	0.25±0.44	0.48±0.91		
No pain	30 (75.0)	29 (72.5)	5.236	0.111
Mild pain	10 (25.0)	6 (15.0)		
Moderate pain	0 (0.0)	2 (5.0)		
Severe pain	0 (0.0)	3 (7.5)		
4 h	0.28±0.45	0.78±1.0		
No pain	29 (72.5)	22 (55.0)	11.341*	0.006*
Mild pain	11 (27.5)	8 (20.0)		
Moderate pain	0 (0.0)	7 (17.5)		
Severe pain	0 (0.0)	3 (7.5)		
8 h	0.48±0.68	0.83±1.11		
No pain	25 (62.5)	23 (57.5)	6.806	0.071
Mild pain	11 (27.5)	6 (15.0)		
Moderate pain	4 (10.0)	6 (15.0		
Severe pain	0 (0.0)	5 (12.5)		
16 h	0.40±0.63	0.95±1.15		
No pain	27 (67.5)	21 (52.5)	9.329*	0.021*
Mild pain	10 (25.0)	6 (15.0)		
Moderate pain	3 (7.5)	7 (17.5)		
Severe pain	0 (0.0)	6 (15.0)		
24 h	0.43±0.75	0.53±0.82		
No pain	29 (72.5)	25 (62.5)	6.009	0.091
Mild pain	5 (12.5)	11 (27.5)		
Moderate pain	6 (15.0)	2 (5.0)		
Severe pain	0 (0.0)	2 (5.0)		

χ^2, P: χ^2 and P values for χ^2 test for comparing between the two groups. ^{MC}P: P value for Monte Carlo for χ^2 test for comparing between the two groups. *P≤0.05, statistically significant.

Table 3 Comparison between the two studied groups according to ear pain with bupivacaine 0.5% spray in group C

Ear pain	Cases (n=40) [n (%)]	Control (n=40) [n (%)]	χ^2	P
Postoperative	0.20±0.41	0.98±1.10		
No pain	32 (80.0)	19 (47.5)	16.749*	^{MC}P=0.001*
Mild pain	8 (20.0)	8 (20.0)		
Moderate pain	0 (0.0)	8 (20.0)		
Severe pain	0 (0.0)	5 (12.5)		
1 h	0.23±0.42	1.03±1.10		
No pain	31 (77.5)	18 (45.0)	18.206*	^{MC}P<0.001*
Mild pain	9 (22.5)	8 (20.0)		
Moderate pain	0 (0.0)	9 (22.5)		
Severe pain	0 (0.0	5 (12.5		
4 h	0.33±0.47	1.0±1.06		
No pain	27 (67.5)	18 (45.0)	17.762*	^{MC}P<0.001*
Mild pain	13 (32.5)	8 (20.0)		
Moderate pain	0 (0.0)	10 (25.0)		
Severe pain	0 (0.0)	4 (10.0)		
8 h	0.38±0.49	0.93±1.12		
No pain	25 (62.5)	21 (52.5)	17.588*	^{MC}P<0.001*
Mild pain	15 (37.5)	6 (15.0)		
Moderate pain	0 (0.0)	8 (20.0)		
Severe pain	0 (0.0)	5 (12.5)		
16 h	0.40±0.50	0.93±1.12		
No pain	24 (60.0)	21 (52.5)	20.673*	^{MC}P<0.001*
Mild pain	16 (40.0)	5 (12.5)		
Moderate pain	0 (0.0)	9 (22.5)		
Severe pain	0 (0.0)	5 (12.5)		
24 h	0.43±0.50	0.75±0.84		
No pain	23 (57.5)	20 (50.0)	12.024*	0.002*
Mild pain	17 (42.5)	10 (25.0)		
Moderate pain	0 (0.0)	10 (25.0)		
Severe pain	0 (0.0)	0 (0.0)		

χ^2, P: χ^2 and P values for χ^2 test for comparing between the two groups. ^{MC}P: P value for Monte Carlo for χ^2 test for comparing between the two groups. *P≤0.05, statistically significant.

Table 4 Comparison between the two studied groups according to throat pain with lidocaine 2% infiltration in group A

Throat pain	Cases (n=40) [n (%)]	Control (n=40) [n (%)]	χ^2	^{MC}P
Postoperative	0.25±0.54	1.53±1.09		
No pain	32 (80.0)	10 (25.0)	30.936*	<0.001*
Mild pain	6 (15.0)	7 (17.5)		
Moderate pain	2 (5.0)	15 (37.5)		
Severe pain	0 (0.0)	8 (20.0)		
1 h	0.23±0.48	1.30±1.14		
No pain	32 (80.0)	12 (30.0)	24.215*	<0.001*
Mild pain	7 (17.5)	13 (32.5)		
Moderate pain	1 (2.5)	6 (15.0)		
Severe pain	0 (0.0)	9 (22.5)		
4 h	0.33±0.66	1.10±1.10		
No pain	31 (77.58)	16 (40.0)	13.755*	0.002*
Mild pain	5 (12.5)	10 (25.0)		
Moderate pain	4 (10.0)	8 (20.0)		
Severe pain	0 (0.0)	6 (15.0)		
8 h	0.25±0.44	0.75±0.81		
No pain	30 (75.0)	19 (47.5)	12.468*	0.002*
Mild pain	10 (25.0)	12 (30.0)		
Moderate pain	0 (0.0)	9 (22.5)		
Severe pain	0 (0.0)	0 (0.0)		
16 h	0.38±0.49	0.80±0.72		
No pain	25 (62.5)	15 (37.5)	10.056*	0.006*
Mild pain	15 (37.5)	18 (45.0)		
Moderate pain	0 (0.0)	7 (17.5)		
Severe pain	0 (0.0)	0 (0.0)		
24 h	0.48±0.60	0.68±0.69		
No pain	23 (57.5)	18 (45.0)	1.957	0.361
Mild pain	15 (37.5)	17 (42.5)		
Moderate pain	2 (5.0)	5 (12.5)		
Severe pain	0 (0.0)	0 (0.0)		

χ^2, P: χ^2 and P values for χ^2 test for comparing between the two groups. ^{MC}P: P value for Monte Carlo for χ^2 test for comparing between the two groups. *P≤0.05, statistically significant.

them (47.5%), while women in group I were 14 (35%) and in group II were 27 (67.5%), and in group III were 21 (52.5%). There was no statistically significant difference between the three groups as regards sex (P=0.003). Thus, there was no sex bias.

Postoperative otalgia

By comparing cases and control of group A, there is statistically significant difference according to the frequency of otalgia postoperatively till the first 24 h after surgery, while when comparing cases and control in group B there is statistically significant difference postoperatively, 4 and 16 h only after surgery. Also, by comparing cases and control in group C there is significant statistical difference postoperatively till the first 24 h after surgery. Increased frequency of postoperative otalgia is present with the control side (saline) (Tables 1–3).

Postoperative throat pain

By comparing cases and control of group A there is significant statistical difference according to the frequency of throat pain postoperatively till the first 16 h after surgery.

While when comparing cases and control in group B there is statistically significant difference postoperatively

Table 5 Comparison between the two studied groups according to throat pain with lidocaine 10% spray in group B

Throat pain	Cases (n=40) [n (%)]	Control (n=40) [n (%)]	χ^2	^{MC}P
Postoperative	0.28±0.45	0.80±0.85		
No pain	29 (72.5)	18 (45.0)	12.222*	0.003*
Mild pain	11 (27.5)	13 (32.5)		
Moderate pain	0 (0.0)	8 (20.0)		
Severe pain	0 (0.0)	1 (2.5)		
1 h	0.43±0.55	0.95±1.01		
No pain	24 (60.0)	18 (45.0)	12.532*	0.004*
Mild pain	15 (37.5)	9 (22.5)		
Moderate pain	1 (2.5)	10 (25.0)		
Severe pain	0 (0.0)	3 (7.5)		
4 h	0.48±0.55	0.83±0.93		
No pain	22 (55.0)	19 (47.5)	8.549*	0.024*
Mild pain	17 (42.5)	11 (27.5)		
Moderate pain	1 (2.5)	8 (20.0)		
Severe pain	0 (0.0)	2 (5.0)		
8 h	0.55±0.54	1.03±1.10		
No pain	19 (47.5)	17 (42.5)	12.186*	0.005*
Mild pain	20 (50.0)	11 (27.5)		
Moderate pain	1 (2.5)	6 (15.0)		
Severe pain	0 (0.0)	6 (15.0)		
16 h	0.58±0.75	1.15±1.08		
No pain	23 (57.5)	15 (37.5)	8.181*	0.034*
Mild pain	11 (27.5)	9 (22.5)		
Moderate pain	6 (15.0)	11 (27.5)		
Severe pain	0 (0.0)	5 (12.5)		
24 h	0.60±0.67	1.10±1.06		
No pain	20 (50.0)	16 (40.0)	10.716*	0.011*
Mild pain	16 (40.0)	8 (20.0)		
Moderate pain	4 (10.0)	12 (30.0)		
Severe pain	0 (0.0)	4 (10.0)		

χ^2, P: χ^2 and P values for χ^2 test for comparing between the two groups. ^{MC}P: P value for Monte Carlo for χ^2 test for comparing between the two groups. *$P \leq 0.05$, statistically significant.

Table 6 Comparison between the two studied groups according to throat pain with bupivacaine 0.5% spray in group C

Throat pain	Cases (n=40) [n (%)]	Control (n=40) [n (%)]	χ^2	P
Postoperative	0.48±0.72	1.68±0.97		
No pain	26 (65.0)	6 (15.0)	28.190*	$^{MC}P<0.001$*
Mild pain	9 (22.5)	9 (22.5)		
Moderate pain	5 (12.5)	17 (42.5)		
Severe pain	0 (0.0)	8 (20.0)		
1 h	0.48±0.64	1.63±1.0		
No pain	24 (60.0)	5 (12.5)	26.360*	<0.001*
Mild pain	13 (32.5)	15 (37.5)		
Moderate pain	3 (7.5)	10 (25.0)		
Severe pain	0 (0.0)	10 (25.0)		
4 h	0.35±0.58	1.43±1.01		
No pain	28 (70.0)	7 (17.5)	26.906*	$^{MC}P<0.001$*
Mild pain	10 (25.0)	17 (42.5)		
Moderate pain	2 (5.0)	8 (20.0)		
Severe pain	0 (0.0)	8 (20.0)		
8 h	0.63±0.70	1.58±1.03		
No pain	20 (50.0)	6 (15.0)	18.681*	<0.001*
Mild pain	15 (37.5)	15 (37.5)		
Moderate pain	5 (12.5)	9 (22.5)		
Severe pain	0 (0.0)	10 (25.0)		
16 h	0.78±0.77	1.75±1.10		
No pain	17 (42.5)	9 (22.5)	24.702*	<0.001*
Mild pain	15 (37.5)	3 (7.5)		
Moderate pain	8 (20.0)	17 (42.5)		
Severe pain	0 (0.0)	11 (27.5)		
24 h	0.80±0.76	1.83±1.06		
No pain	16 (40.0)	5 (12.5)	20.910*	<0.001*
Mild pain	16 (40.0)	11 (27.5)		
Moderate pain	8 (20.0)	10 (25.0)		
Severe pain	0 (0.0)	14 (35.0)		

χ^2, P: χ^2 and P values for χ^2 test for comparing between the two groups. ^{MC}P: P value for Monte Carlo for χ^2 test for comparing between the two groups. *$P \leq 0.05$, statistically significant.

till the first 24 h after surgery. Also, by comparing cases and control in group C there is significant statistical difference postoperatively till the first 24 h after surgery. It appears that increased frequency of postoperative throat pain is present with the control side (saline) (Tables 4–6).

The effect of bupivacaine 0.5% is more prolonged than both lidocaine 10% spray and lidocaine 2% infiltration in reducing postoperative throat pain and referred otalgia.

Discussion

Tonsillectomy has a high incidence of postoperative pain. There is still debate on the optimal analgesia for this common surgical procedure. Different methods have been described and are used to reduce pain including improved intraoperative anesthetic pain regimens, use of corticosteroids, adjustment of surgical technique, and intraoperative LA injection. Successful management provides a major challenge for the providers of health care [31].

The present study under discussion included 120 patients, aged 5–18 years who had undergone tonsillectomy and who were randomized into three equal groups with either peritonsillar region infiltrated by lidocaine 2%, lidocaine 10% spray, or bupivacaine 0.5% spray by syringe in one tonsillar bed

and the other tonsillar bed in each group receives pack with similar amounts of normal saline for 5 min as a control group. The aim was to investigate the effects of infiltration of local agents on postoperative pain in tonsillectomy.

Demographic data

Age of tonsillectomized patients

The selection of patients included in this study was to be 5–18 years to ensure better reliability of the scores of the subjective VAS.

In the current study, the mean age was 16.63±0.68 with a median of 12. It was reported to be 15.9±7.1 years by Erickson *et al.* [32] investigating 35 year epidemiological trends in tonsillectomy and adenotonsillectomy conducted on 8106 patients.

Sex of tonsillectomized patients

There was a male predominance in the current study, with a male : female ratio of 54.16 : 45.83%.

There was no statistical difference between the three studied groups as regards age (P=0.138) and sex (P=0.003), which indicates the absence of bias in these two parameters. Thus, they are quite comparable and with no statistical biases.

Post-tonsillectomy otalgia

In the current study, increased frequency of postoperative otalgia is present with controls (saline) compared with cases in the three groups within 24 h after tonsillectomy, which is a statistical difference that indicates a good advantage of LAs on reducing postoperative otalgia.

Post-tonsillectomy pain

Drugs used

Lidocaine 10% spray: analgesic spray is a novel administration for postoperative pain control. It is delivered by a pump. Such sprays are topical, meaning that they are applied to the surfaces of the body, most commonly the skin, but sometimes to the mucous membranes, such as the throat. A common reason for using an analgesic spray or other topical pain killer, rather than a painkiller taken by mouth, is that topical treatments work directly on the affected area [33].

Lidocaine 2% infiltration: its effect showed a longer duration of action in reducing postoperative pain in comparison to lidocaine 10% spray [22].

Bupivacaine 0.5 % spray: it has the advantage of more prolonged postoperative pain control up to 24 h in comparison to both lidocaine 10% spray and lidocaine 2% infiltration.

Ehsan-ul-Haq *et al.* conducted a multicentric case–control study of 205 patients. The patients underwent tonsillectomy by diathermy. After tonsillectomy and securing hemostasis, a pack soaked in 0.5% bupivacaine solution was put in one tonsillar fossa and a pack soaked in normal saline (control) was put in the other tonsillar fossa. Then after 5 min both packs were removed [34].

Post-tonsillectomy pain was assessed separately on two sides of the throat using VAS. Pain assessment was done at specific time intervals of 1,4,8,16, and 24 h after the surgery.

The results showed a difference of mean pain control between case and control sides at the first hour as 2.32, at fourth hour 1.23, at eighth hour 1.80, at 16 h 1.71 and at 24th hour it was 0.6, showing that pain control was very effective at the first hour but the difference was still present till 24 h. In addition, no complication, reaction, or side effect of bupivacaine was noted in any case in this study [34].

They 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 the immediate postoperative period which remains for a long time up to 24 h after surgery [34].

The results in the previous study concur with the present study findings as the difference of mean pain control between case and control sides in group C bupivacaine 0.5% postoperative was 1.2, at first hour 1.15, at fourth hour 1.08, at eighth hour 0.95, at 16 h 0.97, and at 24th hour it was 1.03, showing that pain control was very effective at the first hour but the difference was still present till 24 h. The same also, no complication, reaction, or side effect of bupivacaine was noted in any case in the present study [34].

Contrary to the present study results, Hydri and Malik [35] conducted a randomized control trial on 46 patients of either gender, aged 10–42 years who underwent tonsillectomy for recurrent tonsillitis. At the end of surgery, having secured hemostasis, one tonsillar fossa was randomly packed with a gauze piece soaked in 3 ml of 0.5% bupivacaine for 5 min, while the other was not. Effects of postoperative analgesia were

assessed using the VAS of up to 8 h [35].The results were that majority of the patients (85%, *n*=39) failed to experience an appreciable pain relief on the side of local anesthetic (bupivacaine) application (*P*=0.006). So they concluded that topical application of local anesthetic (bupivacaine) confers no appreciable pain control in post-tonsillectomy patients [35].

Grainer and colleagues conducted a systematic review and meta-analysis regarding local anesthetic use, either by infiltration or topical application, for post-tonsillectomy pain reduction.

Thirteen studies were included. Overall, local anesthetic, applied topically or infiltrated, significantly reduces pain scores compared with controls at 4–6 h, −0.66 (95% CI: −0.82, −0.50); 20–24 h, −0.34 (95% CI: −0.51, −0.18) and on day 5, −0.97 (95% CI: −1.30, −0.63) (standardized mean differences). These changes approximate to a reduction in pain of between 7 and 19 mm on a 0–100 mm VAS [36].

They concluded that the local anesthetic provides a modest reduction in post-tonsillectomy pain. Topical local anesthetic should be the method of choice for providing postoperative analgesia [36].

Conclusion

From this study, we conclude that: topical application of LA in the tonsillar bed after tonsillectomy results in significant reduction of postoperative throat pain and referred otalgia. LA application after tonsillectomy should be used. Bupivacaine showed a more prolonged duration in reducing postoperative pain.

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Conflicts of interest

There are no conflicts of interest.

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