

The effect of lidocaine spray for pain relief after tonsillectomy in pediatrics

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Abstract

Tonsillectomy is the commonest surgical operation in pediatrics in otolaryngology practice. Pain is emotional feeling that is closely related to tissue damage. Postoperative pain is the most important complication of tonsillectomy that may interfere with normal oral intake, daily activity, delay discharge from the hospital, and constrictor muscles restriction which lead to 2ry bleeding and re -hospitalization. 120 patients aged 5 to 12 years who underwent tonsillectomy at the Otorhinolaryngology section in AL-Sheikhan general hospital were selected to conduct this study. They were divided into two groups with 60 patients each as followings: group (I) received 2 puffs of normal saline in tonsillar bed. Group (II) received 10 % lidocaine 3-5 puffs in each tonsillar bed. These results showed that there was statistically significant difference in all treated patients especially in the early hours half, 1, 4, 8 hours but at 16 hours the statistical difference is still present but it is less than the previous hours and it became not significant at 24 hours post operatively.

Conclusion: The lidocaine aerosol is evidently effective in reducing throat pain in children underwent tonsillectomy especially at the early hours post operatively.

Keywords: Lidocaine spray; Pain relief; Tonsillectomy in pediatrics; Hospital

1. Introduction

Tonsillectomy is the commonest surgical operation in pediatrics in otolaryngology practice (1). Pain is emotional feeling that is closely related to histological tissue damage. Postoperative pain is the most important complication of tonsillectomy that may interfere with normal oral intake, daily activity, delay discharge from the hospital, and constrictor muscles restriction which lead to 2ry bleeding and re -hospitalization (2).

Nowadays, efficient pain management to adjust and block the physiological body responses to stress has become a crucial in recent pediatric anesthesia and surgical practice (3).

Variable topical options were used postoperative to reduce pain like lidocaine, dexamethasone, pethidine (4). During surgery the body is under stress which leads to different physiological changes in the central nervous system like over excitation of the central neurons which associated with increase duration of postsurgical pain (5). So, peripheral nerve block will definitely block the transmission of pain impulses to the central nervous system which leads to reduce the post tonsillectomy pain (6).

Lidocaine is the most common local anesthetic agent applied topically in tonsillar bed. The higher dose that can be given safely is 7 mg/kg and 4.5 mg/kg body weight with and without adrenaline successively. It acts within 2-5 minutes and lasts 1.5-3 hours (7).

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The aim of the current study is to evaluate the effectiveness of using topical application of lidocaine spray in tonsillectomy in children aged 5-12 in reducing throat pain

2. Materials and methods

2.1. Study Approval

The study design was approved by the research committee in Nineveh Health Department/ Mosul, Iraq. In line with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. All parents and patients were asked to sign the consent form after explaining the method of study to them.

2.2. Drug Used

Xylocaine pump spray 50 ml, 10 mg/ spray dose, AstraZeneca AB, Forskargatan, 151 85 SODERTALJE, SWEDEN.

2.3. Patients and methods

The present study is a prospective, cohort study, 120 patients aged 5 to 12 years who underwent tonsillectomy at the Otorhinolaryngology department in AL-Sheikhan general hospital were selected to conduct this study.

They were divided into two groups with 60 patients each as followings: group (I) received 2 puffs of normal saline in each tonsillar bed. Group (II) received 10 % lidocaine 3-5 puffs in each tonsillar bed.

The treatment in both groups was given intraoperatively. Lidocaine was applied into the tonsillar bed immediately after tonsillectomy while patient is under general anesthesia. No other analgesic method was used other than lidocaine spray. All patients under went the same premedication and anesthetic technique.

Pain intensity based on Wong -Baker Faces Pain Scale (Figure 1) with a range of 0 -10 at minute 30, 1,4,8,16, and 24 hours post tonsillectomy. This method is used to determine the intensity of pain in children 5-15 years of age (8). The data were recorded by a nurse and parents who was not aware of the patient group.

Wong -Baker Faces Pain Scale was used in this study which is scale for pain ranged from 0 to 10 points. Facial expressions were characterized by the intensity of the pain. It is often described as suitable for children aged 5 to 15 years old.

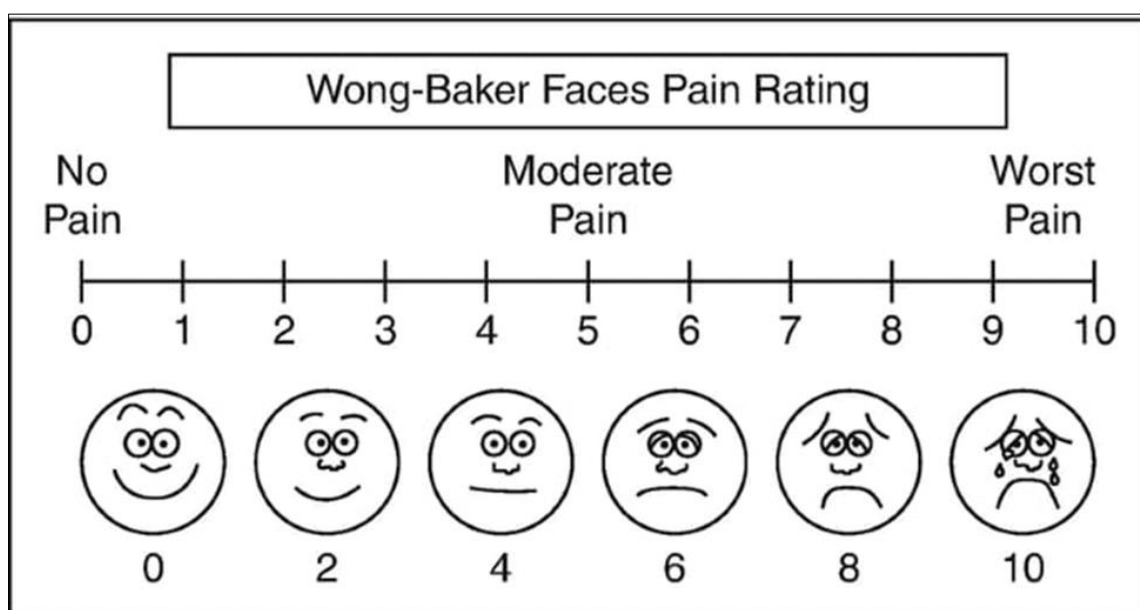


Figure 1 Wong -Baker Faces Pain Scale

2.4. Statistical analysis

Statistical analysis was performed by statistical software SPSS version 18 using (t- test) to determine if there is a significant difference between the means of the groups and to find out how they are related. (10)

3. Results

The patients were divided into treated group and control group. Assessment of pain in patients that received the lidocaine puffs intraoperatively in correlation with time was explained in table (1) which describe the intensity of pain starting from no pain, mild, moderate, and severe in the first half, 1, 4, 8, 16, and 24 hours post operatively after tonsillectomy (Chart 1).

It is found that the group that received lidocaine in the first 30 minutes showed statistically significant difference (0.001) at ($P < 0.05$). After 1 hour of administration of lidocaine the group showed statistically significant difference (0.000) at ($P < 0.05$). Four hours after receiving lidocaine the group showed statistically significant difference (0.010) at ($P < 0.05$). Eight hours statistically significant difference (0.022) at ($P < 0.05$) (Table 2).

Sixteen hours after receiving lidocaine the group showed statistically significant difference (0.033) at ($P < 0.05$). Twenty-four hours after receiving lidocaine the group showed statistically no significant difference (0.093) at ($P < 0.05$) (Table 2).

These results showed that there was statistically significant difference in all treated patients especially in the early hours half, 1, 4, 8 hours but at 16 hours the statistical difference is still present but it is less than the previous hours and it became not significant at 24 hours post operatively.

These results mean that the effect of lidocaine is more evident in the first few hours of receiving the lidocaine puffs in tonsillar bed and it is efficient in reducing pain especially in the early hours 1,4,8 But, its effect is reduced after 16 hours and 24 hours of receiving lidocaine.

Table 1 Showed the treated and control groups in correlation with time after tonsillectomy

Postoperative pain	Lidocaine group	Control group
30min		
No pain	29	18
mild	19	21
moderate	9	14
Sever	3	7
1 hr		
No pain	36	20
mild	18	23
moderate	6	15
Sever	0	2
4 hr		
No pain	29	18
mild	19	21
moderate	9	14
Sever	3	7
8 hr		
No pain	28	20

mild	22	24
moderate	8	12
Sever	2	4
16 hrs.		
No pain	26	16
mild	22	20
moderate	10	18
Sever	2	6
24 hrs.		
No pain	24	12
mild	22	18
moderate	11	22
Sever	3	8

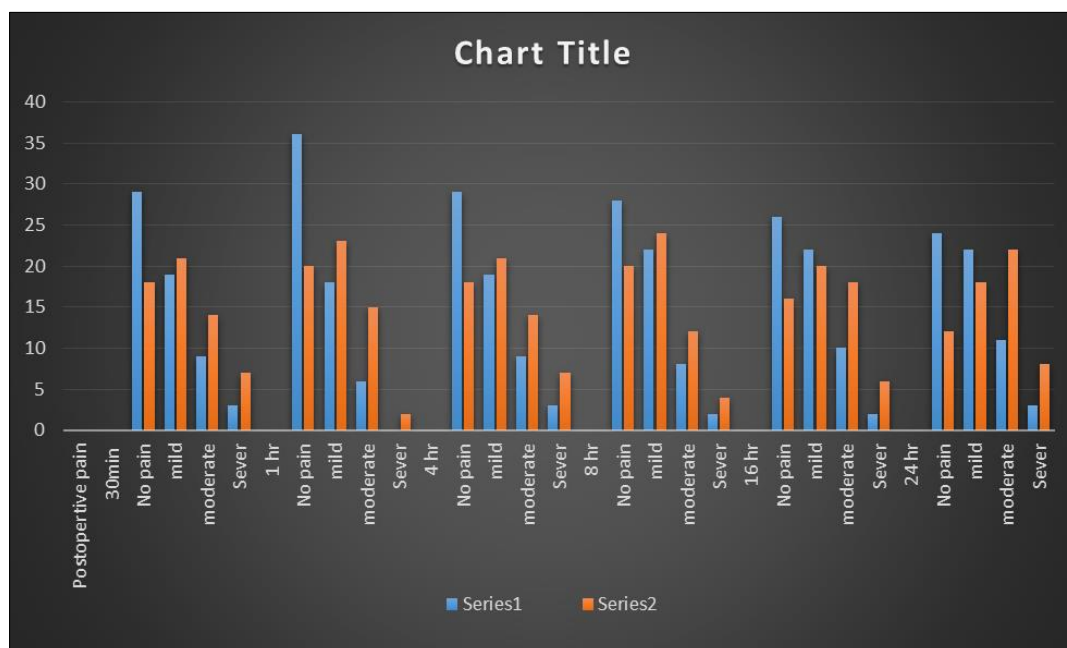


Figure 2 Severity of pain in correlation with time in treated patients after tonsillectomy

Table 2 Showed the significant differences between treated patients at different periods

Treated patients	Significant difference
30 minutes	0.001
1 hour	0.000
4 hours	0.010
8 hours	0.022
16 hours	0.033
24 hours	0.093

4. Discussion

In the current study it was found that the patients received the lidocaine puffs in tonsillar bed in the first half, 1, 4, 8 hours post operatively are more comfortable and they suffer less from pain than after 16 and 24 hours.

The significant differences were high in the first half, 1, 4, and 8 hours then it started to decrease at the 16 hours after administration of lidocaine but it was still significant. While at 24 hours of giving lidocaine puffs it showed no significant difference.

These results were similar to Cheng et al., 2023 (11) results who found that the use of lidocaine aerosol in tonsillar bed in pediatric patients was greatly effective in reducing pain post operatively specially in the first few hours but not at 24 hours of treatment.

Also, Bissonnette et al., 1990 (12) study used lidocaine hydrochloride aerosol in tonsillar bed after tonsillectomy in children and they found that it was greatly reduced the pain and suffering in patients.

The results of the current study are similar to El Daly et al., 2018 (13) study who found that using local anesthesia in tonsillar bed during tonsillectomy was greatly effective in reducing throat pain and even the referred pain was reduced.

Also, Kaygusuz and Susaman (2003) (14). used different analgesics like bupivacaine hydrochloride, dexamethasone and lidocaine and they found that lidocaine spray in the first day postoperatively was greatly reduce throat pain.

The results of this study are the same as Ozkiriş et al., 2012 (15). who used topical lidocaine hydrochloride post tonsillectomy in children and they found that it was efficiently decrease throat pain

In addition, Sorensen et al., (2003) (16). study also showed that injecting small doses of lidocaine in tonsillar bed in tonsillectomy can reduce pain in pediatric patients.

In other different studies that associated with trials to reduce and relieve pain in tonsillectomy, the surgeons use direct injection and local infiltration of lidocaine in peritonsillar space which is more dangerous and associated with serious complications including accidental intravascular injection that may end with cardiac asystole and even convulsion, temporary vocal cord paralysis, vagus nerve blockage which can lead to upper airway obstruction and even deep cervical abscess. (17,18,19).

On the other side, the use of lidocaine spray in tonsillectomy has less harmful effect, no serious complications were expected as those associated with local analgesic injection, and no serious consequences on the central nervous system and no expected complications of local blood vessels injuries (20). While the use of lidocaine aerosol in addition to the previously mentioned advantages in this study it is also associated with rapid onset of action, safety, and efficiency, in addition it is an easy process and not invasive (21).

5. Conclusion

The lidocaine aerosol is evidently effective in reducing throat pain in children underwent tonsillectomy especially at the early hours post operatively.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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