https://doi.org/10.29309/TPMJ/2025.32.03.8378

The Professional Medical Journal
www.theprofesional.com
2025, Volume, 32 Issue, 03

ORIGINAL ARTICLE

Use of 10% lignocaine spray in adenotonsillecotmy surgery for post-operative pain and cough.

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Article Citation: Iqbal S, Hussain A, Abdelmottaleb NA, Munir S, Ahmed AGA, Mahmoud IF. Use of 10% lignocaine spray in adenotonsillecotmy surgery for post-operative pain and cough. Professional Med J 2025; 32(03):254-259. https://doi.org/10.29309/TPMJ/2025.32.03.8378

ABSTRACT… Objective: To determine the efficacy of 10% lignocaine spray for preventing post-operative cough and pain for adenotonsillectomy surgery. **Study Design:** Quasi Experimental study. **Setting:** Department of Anesthesia, Armed Forces Hospital Jazan, Saudi Arabia. **Period:** March 2024 till August 2024. **Methods:** A total of 140 patients with age from 4-12 years scheduled for adenotonsillectomy were equally divided in two groups. After intubation in group L, one puff of 10% lignocaine on each side was sprayed over the tonsils. Similarly at the end of the surgery lignocaine puff was repeated on each side in the same manner. However in group N, instead of lignocaine spray, normal saline spray was done in similar manner. All patients were observed for persistent coughing. All patients were also observed for pain using Modified Objective Pain Scale. Any patient with score of 5 or more was given rescue analgesia. **Results:** In group L, only 11 (15.71%) out of 70 patients experienced cough while in group N, 16 (22.85%) patients experienced cough post-operatively. This difference was insignificant (p-value 0.284). In group L, median and interquartile range for modified objective pain score was 1 and 3 respectively whereas it was 1 and 2 for group N. In group L, less patient's i-e 5 only received rescue analgesia whereas 8 patients in group N received rescue analgesia but this difference was in significant (p-value 0.382). **Conclusion:** It is concluded in our study that 10% lignocaine spray does not reduce the incidence of post-operative cough and has no effect on post-operative pain scores as compared to the normal saline spray.

Key words: Adenotonsillectomy, Cough, Lignocaine Spray, Post-operative Analgesia, Post-operative Pain, Topical Anesthesia.

INTRODUCTION

Adenotonsillectomy is the commonest surgery done by otorhinolaryngologists in paediatric group population.[1] Though it is simple and short surgery but it is associated with many complications, some of them can prove to be life threatening.[2] It is a very painful procedure and associated with many post-operative complications including cough.[3-4] If poorly managed, it can lead to agitation, anxiety, agony, patient and parent dissatisfaction. Therefore a good balanced analgesic strategy is of utmost importance to reduce the incidence of above mentioned complications.

Many researchers have tried various combinations of analgesics including morphine, fentanyl, sufentanyl, tramadol, pethidine, paracetamol, ketorolac, dexmedetomidine etcetera but none has proven to be superior to others.[5-7] All the above drugs if used in high doses carry the risk of life threatening adverse effects. Opioids if given in high doses can lead to respiratory depression and dependency, on the other hand if NSAIDs are given in high does can lead to post-op bleeding, GI disturbance.[8-9] So we are yet to see a perfect analgesic regimen for pain free adenotonsillectomy.

Many researchers have also tried regional blocks including glossopharyngeal nerve block and local infiltration of the local anesthetics with varying degree of success.[10]

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Article received on: 06/09/2024
Accepted for publication: 14/11/2024

These procedures are invasive, time consuming and are associated with increased risk of post-operative bleeding and many surgeons prefer to avoid these techniques.

Few researchers have also tried the 2% and 10% lignocaine spray.[11] The results of these studies are not conclusive. In these studies, most of the researchers sprayed the lignocaine at the end of the surgery. In our study, we used the lignocaine spray twice, i-e just before the start of surgery and then at the end of surgery just before extubation in one group while in other group patients did not receive the lignocaine spray. Result of our study will help determine the efficacy of 10% lignocaine spray for preventing post-operative cough and pain for adenotonsillectomy surgery.

METHODS

This Quasi experimental study was conducted in anesthesia department Armed Forces Hospital Jazan Saudi Arabia from March 2024 till August 2024 after approval from ethical committee (JAFH24003-4-3-24) A total of 140 patients of either gender with age range from 4 to 12 years scheduled for elective adenotonsillectomy were selected for the study provided their parents sign the written consent to participate in the study. Sample size was calculated with the help of G Power software version 3.1.

Patients with history of cough, allergy to local anesthetics and having oropharangeal imflammation due to any cause were excluded from the study. Patients in whom 3 or more attempts of laryngoscopy were made, were also be excluded from this study. All patients received standard anesthesia care. All patients were randomly divided into two groups using random number table method. In both groups, premedication included metoclorpromide, dexamethasone, fentanyl 1.5 mcg/kg, paracetamol 15 mg/kg and Induction of anesthesia was done with propofol and cisatracurium after appropriate preoxygenation.

All patients were intubated with either cuffed or uncuffed ETT appropriate for their age. After intubation in group L, one puff of 10% lignocaine on each side was sprayed over the tonsils. Similarly at the end of the surgery lignocaine puff was repeated on each side in the same manner. However in group N, instead of lignocaine spray, normal saline spray was done in the similar manner. Both lignocaine and normal saline spray bottles were covered and all the researchers were unaware of the content of the spray bottle.

A nurse was made responsible for allocating groups and proving the spray to the researchers. All patients were reversed with neostigmine and glycopyrolate at the end of surgery. Patients were extubated in lateral position fully awake after careful thorough suction. All patients were observed for 40 minutes in post-anesthesia care unit. All patients were observed for persistant coughing (any cough bout lasting for more than 20 second or 3 or more cough bouts lasting less than 20 seconds). All patients were also observed for pain with the help of Modified Objective Pain Scale (MOPS) (Table-I) for pain score.[12] Any patient with MOPS score of 5 or more was given rescue analgesia (Pethidine 0.5 mg/kg).

Parameter	Observation	Score
Cry	No	0
	Consolable	1
	Not consolable	2
Movement	No movement	0
	Restless	1
	Thrashing	2
Agitation	Calm	0
	Mild	1
	Hysterical	2
Posture	Normal	0
	Flexed	1
	Holds injury site	2
Verbal	Asleep/No complaint	0
	Complaints/can't localize	1
	Complains/can localize	2

Table-I. Modified objective pain scale

For data collection, a special proforma was designed. Demograhpic data including age, gender, height and weight was collected. Duration of surgery was noted. Type of the tube

(cuffed/uncuffed), post-op coughing and need to give rescue analgesia were also be noted in the proforma.

Statistical Design: The data was analyzed using IBM version SPSS 26.0 statistical software. For nominal variables, data were depicted as frequency and percentage, and for numerical variables, mean ± standard deviation (Mean±SD). Both groups were compared with the help of Chi-square test in terms of frequency of cough whereas for comparison of pain score, we used Mann Whitney U test.

RESULTS

Primary outcome measures in our study were presence or absence of cough, difference of MOPS pain score and use of rescue analgesia between both groups. For this study, 140 selected patients age range was from 4 to 11 years with mean of 6.48±1.88 years. Both groups were comparable in terms of age. In group L, 36 (51.43%) patients were male and 34 (48.57%) patients were female with male to female ratio of 1.06:1. In group N, 44 (62.86%) patients were male while 26 (37.14%) patients were female with male to female ratio of 1.69:1. Both groups were comparable in terms of gender difference. In group L, mean height was 1.15±0.11 meters whereas in group N, it was 1.18±0.13 meters. This difference was insignificant. In group L, mean weight was 22.09±5.39 kilograms whereas it was 23.02±5.64 in group N. The difference of weight was also not significant. Both groups were also comparable in terms of Body mass index. Detailed comparison of demographic parameters is shown in Table II.

Demographic Parameter		Group L	Group N	P-Value
Age (Years)		6.6±2.01	6.35±1.75	0.447
Height (Meters)		1.15±0.11	1.18±0.13	0.138
Weight (Kilograms)		22.09±5.39	23.025.65	0.321
BMI (kg/m^2)		16.41±1.97	16.27±1.83	0.638
Gender n (%)	Male	36 (51.43%)	44 (62.86%)	0.172
	Female	34 (48.57%)	70 (37.14%)	

Table-II. Comparison of demographic parameters.

In both groups, in majority of the patients, we used uncuffed endotracheal tube (ETT). In group L, 48 (68.57%) patients had uncuffed while 22 (31.43%) had cuffed ETT. In group N, 55 (78.57%) patients had uncuffed while 15 (21.43%) patients had cuffed ETT. This difference between two groups was insignificant with a p-value of 0.18.

In group L, mean duration of surgery was 31.47±5.26 minutes, whereas in group N, it was 33.41±6.86 minutes. This difference of duration of surgery was not significant with p-value of 0.062.

In group L, only 11 (15.71%) out of 70 patients experienced cough while in group N, 16 (22.85%) patients experienced cough post-operatively. This difference was statistically insignificant with p-value of 0.284. Results of frequency of cough was stratified with type of ETT used (cuffed/uncuffed) and results were comparable as shown in the Table-III.

ETT Type	Cough	Group L (n%)	Group N (n%)	P-Value
Un-cuffed	Yes	9 (12.86%)	13 (18.57%)	0.546
	No	39 (55.71%)	42 (60%)	
Cuffed	Yes	2 (2.86%)	3 (4.29%)	0.341
	No	20 (28.57%)	12 (17.14%)	
Total	Yes	11 (15.71%)	16 (22.86%)	0.284
	No	59 (84.29%)	54 (77.14%)	

Table-III. Stratification of frequency of cough with type of ETT used (cuffed/uncuffed)

In both groups, MOPS score was comparable with a p-value of 0.51. Detailed results are shown in Table-IV. Comparison of frequency of MOPS score is shown in Figure-1.

Group	Median	Interquartile Range	P-Value
Group L	1.0	3.0	0.51
Group N	1.0	2.0	

Table-IV. Comparison of modified objective pain scale score

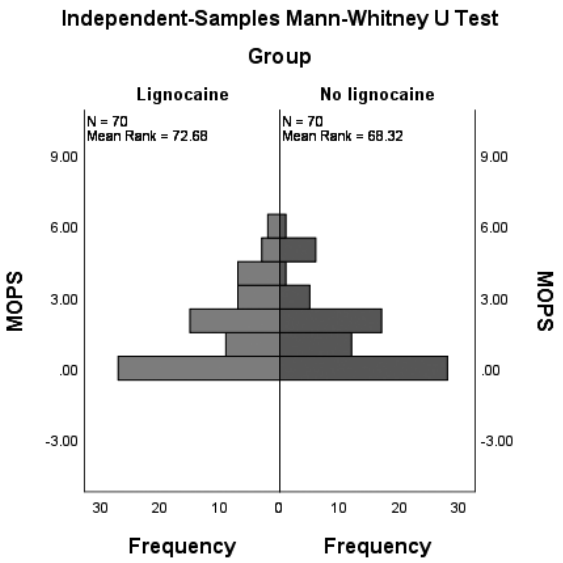

Figure-1. Comparison of frequency of modified objective pain scale score

In group L, less patient's i-e 5 only received rescue analgesia whereas 8 patients in group N received rescue analgesia but this difference was statistically not significant with p-value of 0.382.

DISCUSSION

Adenotonsillectomy is one of the commonest surgeries performed in the pediatric age group.[13] An optimal analgesic plan is of utmost importance as the failure to achieve optimum post-operative analgesia can result in patient and parent dissatisfaction, anxiety and agony. In this study we compared the efficacy of two different multimodal analgesic regimens to overcome these complications.

In our study we observed that there was no statistically significant difference between two groups in term of post-operative cough (11% patients in L and 16% in group N). In a similar study conducted by Iranian researchers observed that patients in lignocaine spray group had lower incidence of post-operative cough but this difference was not statistically significant.[14] This is exactly what we observed in our study. However, Li L-W et al in a similar study observed that topical lignocaine spray significantly reduced the incidence of post-operative cough in cases of pediatric adenotonsillectomy surgery.[15] These results are quite contrary to our results.

In our study we observed the effect of ETT type i-e cuffed or uncuffed. We found out that incidence of cough was slightly higher in patients of both groups in whom cuffed ETT was used but this difference was not statistically significant. Singhal SK et al. in their study reached out to the conclusion that use of laryngeal mask airway, uncuffed and cuffed ETT are equally safe in pediatric age group and the incidence of airway complications including cough is similar with all three devices.[16]

In our study we observed that there was no statistical difference in both groups in terms of post-operative pain scores. Ahmed El-Sharkawy M et al. in a similar study compared the effect of topical lignocaine, bupivacaine infiltration and intravenous paracetamol. They found out that there was no significant statistical difference between all groups in terms post-operative pain score up to 6 hours.[17] Contrary to these results, Yap D et al. in their meta-analysis concluded that application of local anesthetics significantly improve the post-operative pain outcomes.[18] Mutlu V et al. compared the effect of various local anesthetics with a placebo group and reached to conclusion that local anesthetics significantly decrease the post-operative pain scores.[19]

In our study, we observed that in lignocaine spray group, slightly less number of patients received rescue analgesia as compared to control group but this difference was statistically not significant with p-value of 0.382. Similar results were observed in a study conducted by Loy KA e. They concluded that skipping the local anesthetic for adenotonsillectoy does not worsen the pain outcomes, reduces the risk of local anesthetic toxicity and also reduces the overall cost of treatment. However, Opperman JB et al. in their study found out that use of 10% lignocaine spray significantly reduces the post-operative analgesia requirements.[11]

Limitation of our study is that we only observed the patients in immediate post-operative period. It is recommended that similar study should be

conducted and patient should be observed for at least 8 hours to see the effects of local anesthetic spray.

CONCLUSION

It is concluded in our study that 10% lignocaine spray does not reduce the incidence of post-operative cough and has no effect on post-operative pain scores as compared to the normal saline spray.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

SOURCE OF FUNDING

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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3	Neazy Abdelmokhles Abdelmottaleb	Concept, Study design, Data collection, Proof reading, Critical review.	
4	Sajid Munir	Design, Mannscript writing, Data collection.	
5	Ahmed Gamal Abdelghaffar Ahmed	Concept, data analysis, drafting, critical review.	
6	Ibrahim Fadl Mahmoud	Study design, critical review, data analysis, Proof reading.