



Comparative Analysis of Sore Throat Incidence with and without Lidocaine Jelly Application on Endotracheal Tube Cuffs: A Prospective Study

Hormo Naso¹, Sumit Pant², Sunil Kumar Chamola^{3*} and Utkarsh khandelwal⁴

¹Department of Anaesthesia and Operation Theatre Technology, Sikkim Manipal University,
Gangtok, India

²Department of Allied Health Sciences, SGT University, Gurugram, Haryana, India

³Department of Community Medicine, Maharishi Markandeshwar College of Medical Science
and Research (MMCMSR), Haryana, India

⁴Department of Emergency Medicine, SGT University, Gurugram, Haryana, India

*Corresponding e-mail: sumitpanth_fahs@gmail.com

Received: 04-October-2024, Manuscript No. IJMRHS-24-149648; **Editor assigned:** 07-October-2024, Pre QC No. IJMRHS-24-149648 (PQ); **Reviewed:** 22-October-2024, QC No. IJMRHS-24-149648; **Revised:** 04-July-2025, Manuscript No. IJMRHS-24-149648 (R); **Published:** 11-July-2025

ABSTRACT

Introduction: Sore throat is a common complication following endotracheal intubation, often attributed to mucosal irritation by the endotracheal tube cuff. Lidocaine jelly application on the cuff has been proposed as a preventive measure; however, its efficacy remains debated.

Objective: This study aims to investigate the incidence of sore throat in patients undergoing endotracheal intubation, comparing cases where the cuff is coated with lidocaine jelly versus cases without such application.

Methods: A prospective study was conducted on 60 patients scheduled for elective surgeries requiring endotracheal intubation. Patients were randomly assigned to two groups: One where lidocaine jelly was applied on the cuff of the endotracheal tube and the other without such application. Sore throat incidence was assessed postoperatively at intervals using standardized scoring systems.

Results: Preliminary findings indicate that patients in the lidocaine jelly group exhibited a lower incidence of sore throat compared to the control group. Statistical analysis revealed a significant difference ($p < 0.05$) between the two groups, suggesting the potential benefit of lidocaine jelly in reducing post-intubation sore throat.

Conclusion: The application of lidocaine jelly on the cuff of endotracheal tubes may be associated with a decreased incidence of sore throat following intubation. Further research with larger sample sizes and longer follow-up periods is warranted to validate these findings and elucidate the optimal technique and dosage of lidocaine jelly application for mitigating post-intubation complications.

Keywords: Incidence, Lidocaine, Sore throat, Endotracheal

INTRODUCTION

The Endo-Tracheal Tube (ETT) was used for the first time in the early 1900's [1]. ETTs are made of PVC, rubber, etc. and are placed between the vocal cords in the trachea to provide ventilation. Modifications to ETT have been made to minimize the chances of aspiration and to prevent airway leaks during the time of ventilation [2]. Some ETTs are cuffed, whereas others could be uncuffed due to concerns that cuff pressure would harm the trachea *via* pressure necrosis. Moreover, the trachea in children is narrow [3]. The ETTs are selected by internal diameter in millimetres (mm). After successful intubation, the length of ETT is noted at the central incisor or lips. The depth serves as a baseline assessment to ensure that the tube has not advanced further into the trachea. PVC is not a radio-opaque material thus the radio-opaque line is present on the ETT to make it visible under X-ray [4]. A cuff is present at the distal end of an ETT (which is an inflatable balloon). Paediatric ETTs may be cuffed or un-cuffed. The inflating cuff makes a sealing against the tracheal wall, preventing aspiration and forming a seal for positive pressure ventilation. The cuff is inflated with the help of a syringe. The syringe inflates both the cuff and the pilot balloon. While performing cuff inflation, cuff pressure must be 20 and 30 cm H₂O [5,6].

During the intubation procedure, high inflation of the cuff of the ETT can be the source of laryngospasm, sore throat after surgery, stridor (high-pitched sound most often heard while breathing in), laryngeal nerve damage, tracheal bleeding and rupture [7-9]. On the other hand, inflation can lead to air leakage, aspiration and ventilation-associated pneumonia.

The etiology is multifaceted, taking into account patient-related characteristics such as age, gender, smoking, as well as intubation variables such as method, duration, tube size, intracuff pressure, cuff design, intra-operative tube movement, and suctioning. Analgesic use increases as a result of postoperative pain, particularly sore throat.

Lidocaine is a local anaesthetic that is frequently used for local and topical anaesthesia as well as for antiarrhythmic and analgesic purposes as well as a tracheal intubation adjunct. Lubricant with no colour or perfume ingredients that are biologically inert is used on the cuff. Lignocaine jelly is commonly used in medical treatment because it is non-staining and easy to clean.

Research question

What is the incidence of sore throat in patients undergoing endotracheal tube intubation with and without the use of lignocaine jelly?

MATERIALS AND METHODS

A randomized, prospective, comparative clinical study was conducted at SGT University, Hospital and Research Institute Budhera, Gurugram, Haryana in the Department of Anaesthesiology and Critical Care. After receiving ethical committee approval, the study was carried out. Before being included in the trial, each subject provided written informed consent.

A total of 60 intra-operative patients were enrolled in the study, lignocaine jelly was used on the cuff of an endotracheal for the first 30 patients and the other 30 patients' endotracheal tube was placed without using lignocaine jelly. The patients were asked verbally for sore throat at the time interval of 30 minutes, 1 hour, 2 hours, 4 hours and 12 hours after surgery.

For the study, equal numbers of patients were randomly divided into two groups

- **Group L (30 patients):** ET intubation with use of lignocaine jelly.
- **Group N (30 patients):** ET intubation without the use of lignocaine jelly.

Simple random sampling was done for the allocation of groups. Patients were subject to thorough history, clinical examination, biochemical investigations, and detailed pre-anaesthetic assessment.

Inclusion criteria

- Patients undergoing general anaesthesia with ET tube intubation
- Patients of age between 18-60 years

- Patients with ASA grades I and II
- Patients with Mallampati scores of I and II

Exclusion criteria

- Emergency cases
- The patient was intubated with LMA or I gel
- Patients under the age of 18 or over the age of 60
- Patients with ASA levels III and IV

Statistical analysis

The information was coded and entered into a spreadsheet in Microsoft Excel. The analysis was carried out using the Windows software programme SPSS version 26 (IBM SPSS Statistics Inc., Chicago, Illinois, USA). Percentage, mean and standard deviation all were part of descriptive statistics.

The results obtained from the two groups were compared by using the student t-test. Repeated measures ANOVA, and *Chi-square* test. The p-value was taken from the chart of probability. The significance level was established by a p-value of 0.05.

RESULTS

In the present study, the incidence of sore throat with and without lignocaine jelly on the cuff of the endotracheal tube was compared and evaluated in 60 patients. Patients were of both sexes and over the age of 18-65 years. These patients were randomly allocated into two groups depending upon the with and without lignocaine jelly used. Each group was comprised of 30 patients.

In the present study, Table 1 shows that the mean age of group N was 38.03 with 11.62 standard deviations, for group L it was 38.20 with 14.09 SD, the t-test was applied for comparison and the results were not significant at a 0.05 level of significance. Similarly, the mean weight of group N was 57.42 with an 11.30 standard deviation and for group L the mean and SD were 56.97 and 9.20 respectively, a t-test was applied for comparison between group N and L and the results were not significant at 0.05 level of significance.

Table 1 Distribution of study participants according to age and weight group amongst those without lignocaine jelly and with lignocaine jelly group

	Group N Mean ± SD	Group L Mean ± SD	t-test	p-value
Age	38.03 ± 11.62	38.20 ± 14.09	0.05	0.960 ^{NS}
Weight	57.42 ± 11.30	56.97 ± 9.20	0.169	0.866 ^{NS}

Note: NS: Not significant

SPO₂ group with and without lignocaine jelly

In the present study, Table 2 shows the SPO₂ of the participant's changes after surgery with different time intervals. In group N, at 30 minutes mean SPO₂ was 99.47 on average with a 0.82 Standard deviation, after 1 hour SPO₂ was 99.50 with a 0.78 standard deviation. Similarly, after 2 hours, 4 hours, and 12 hours the SPO₂ level rose not much but statistically the result was significant at a 0.001 level of significance. Similarly, in group L, at 30 minutes mean SPO₂ was 99.70 on average with a 0.60 standard deviation, after 1 hour SPO₂ was 99.50 with a 0.73 standard deviation. Similarly, after 2 hours, 4 hours, and 12 hours the SPO₂ level rising not much but statistically the result was significant at a 0.001 level of significance.

Table 2 Comparison of SPO₂ within the group N and L by using repeated measure ANOVA

SPO ₂	Group N Mean ± SD	Group L Mean ± SD
30 minutes after surgery	99.47 ± 0.82	99.70 ± 0.60
1 hour after surgery	99.50 ± 0.78	99.50 ± 0.73
2 hours after surgery	99.80 ± 0.48	99.83 ± 0.46
4 hours after surgery	99.87 ± 0.35	99.87 ± 0.35
12 hours after surgery	99.83 ± 0.38	99.80 ± 0.41
F-value	5.54	4.96
p-value	0.001*	0.001*
Note: *=Significant at 0.01 level		

Heart rate group with and without lignocaine jelly

In the present study, Table 3 shows the heart rate of the participant's changes after surgery at different time intervals. In group N, at 30 minutes mean heart rate was 73.07 on average with a 9.11 standard deviation, after 1-hour heart rate was 73.97 with a 7.44 standard deviation, after 2 hours it was 79.37 with an 8.73 standard deviation, after 4 hours it was 79.27 with 10.34 standard deviation, and 12 hours it was 71.90 with 3.64 standard deviation. Statistically, the result was significant at a 0.001 level of significance. According to group L, at 30 minutes mean heart rate was 69.33 on average with a 7.85 standard deviation, after 1-hour heart rate was 68.73 with a 6.39 standard deviation, after 2 hours it was 71.97 with an 8.70 standard deviation, after 4 hours it was 72.73 with 10.08 standard deviation, and 12 hours it was 90.33 with 27.79 standard deviations. Statistically, the result was significant at a 0.001 level of significance.

Table 3 Comparison of HR within the group N and L by using repeated measure ANOVA

Heart rate	Group N Mean ± SD	Group L Mean ± SD
30 minutes after surgery	73.07 ± 9.11	69.33 ± 7.85
1 hour after surgery	73.97 ± 7.44	68.73 ± 6.39
2 hours after surgery	79.37 ± 8.73	71.97 ± 8.70
4 hours after surgery	79.27 ± 10.34	72.73 ± 10.08
12 hours after surgery	71.90 ± 3.64	90.33 ± 27.79
F-value	11.81	11.12
p-value	0.001*	0.001*
Note: *=Significant at 0.01 level		

Blood pressure group of with and without lignocaine jelly

In the present study, Table 4 shows the systolic blood pressure of the participant changes after surgery at different time intervals. In group N, at 30 minutes mean systolic pressure was 125.50 on average with a 14.25 standard deviation, after 1-hour systolic pressure was 123.27 with a 13.38 standard deviation, after 2 hours it was 120.43 with an 11.97 standard deviation, after 4 hours it was 121.61 with 7.79 standard deviations and 12 hours it was 122.03 with 4.51 standard deviation. Statistically, the result was not significant at a 0.099 level of significance in group L.

At 30 minutes mean systolic pressure was 126.60 on average with a 13.74 standard deviation, after 1-hour systolic pressure was 124.10 with a 12.75 standard deviation, after 2 hours it was 123.17 with 9.93 standard deviations, after 4 hours it was 122.00 with 12.78 standard deviations and 12 hours it was 121.87 with 7.94 Standard deviations. Statistically, the result was not significant at a 0.062 level of significance.

Table 4 Comparison of BP (SYS) within groups N and L by using repeated measure ANOVA

SBP	Group N Mean ± SD	Group L Mean ± SD
30 minutes after surgery	125.50 ± 14.25	126.60 ± 13.74
1 hour after surgery	123.27 ± 13.38	124.10 ± 12.75
2 hours after surgery	120.43 ± 11.97	123.17 ± 9.93
4 hours after surgery	121.60 ± 7.79	122.00 ± 12.78
12 hours after surgery	122.03 ± 4.51	121.87 ± 7.94
F-value	1.99	2.31
p-value	0.099 ^{NS}	0.062 ^{NS}
Note: NS: Not Significant		

In the present study, Table 5 shows the diastolic blood pressure of the participant changes after surgery at different time intervals. In group N, at 30 minutes mean diastolic pressure was 79.53 on average with a 12.42 standard deviation, after 1-hour diastolic pressure was 77.13 with a 9.95 standard deviation, after 2 hours it was 77.90 with a 10.34 standard deviation, after 4 hours it was 79.40 with 4.48 standard deviation, and 12 hours it was 80.40 with 2.66 standard deviations. Statistically, the result was not significant at a 0.379 level of significance. In group L, at 30 minutes mean diastolic pressure was 79.60 on average with a 12.21 standard deviation, after 1-hour diastolic pressure was 77.60 with a 10.09 standard deviation, after 2 hours it was 77.50 with a 9.83 standard deviation, after 4 hours it was 79.53 with 6.87 standard deviations, and 12 hours it was 80.67 with 3.88 Standard deviations. Statistically, the result was not significant at the level of significance.

Table 5 Comparison of BP (DYS) within the group N and L by using repeated measure ANOVA

DBP	Group N Mean ± SD	Group L Mean ± SD
30 minutes after surgery	79.53 ± 12.42	79.60 ± 12.21
1 hour after surgery	77.13 ± 9.95	77.60 ± 10.09
2 hours after surgery	77.90 ± 10.34	77.50 ± 9.83
4 hours after surgery	79.40 ± 4.48	79.53 ± 6.87
12 hours after surgery	80.40 ± 2.66	80.67 ± 3.88
F-value	1.06	1.61
p-value	0.379 ^{NS}	0.177 ^{NS}
Note: NS: Not significant.		

In the present study Table 6 shows that when SPO₂ was checked at the time interval of 30 minutes after surgery its mean and standard deviation in group N and group L it was 99.46 ± 0.82 and 99.7 ± 0.60 respectively and their p-value was 0.210 which means it is not significant at the significance level of 0.05. In 1 hour after surgery, the mean and standard deviation in groups N and L it was 99.5 ± 0.78 and 99.5 ± 0.73 and their p-value was 1.000 which is

not significant at the significance level of 0.05. after 2 hours it was 99.8 ± 0.48 and 99.83 ± 0.46 and its p-value was 0.786 which is not significant at the significance level of 0.05. after 4 hours it was 99.86 ± 0.35 and 99.86 ± 0.35 and its p-value was 1.000 which is not significant at the significance level of 0.05. After 12 hours it was 99.83 ± 0.38 and 99.8 ± 0.41 and its p-value was 0.744 which is not significant at the significance level of 0.05.

Table 6 Comparison between the groups by using an independent t-test

Parameters	Group N Mean \pm SD	Group L Mean \pm SD	p-value
SPO ₂ 30 mins	99.46 \pm 0.82	99.7 \pm 0.60	0.210 ^{NS}
SPO ₂ 1 hr	99.5 \pm 0.78	99.5 \pm 0.73	1.000 ^{NS}
SPO ₂ 2 hrs	99.8 \pm 0.48	99.83 \pm 0.46	0.786 ^{NS}
SPO ₂ 4 hrs	99.86 \pm 0.35	99.86 \pm 0.35	1.000 ^{NS}
SPO ₂ 12 hrs	99.83 \pm 0.38	99.8 \pm 0.41	0.744 ^{NS}
HR 30 mins	73.06 \pm 9.11	69.33 \pm 7.85	0.094 ^{NS}
HR 1 hour	73.96 \pm 7.44	68.73 \pm 6.39	0.005*
HR 2 hours	79.36 \pm 8.73	71.96 \pm 8.70	0.002*
HR 4 hours	79.26 \pm 10.34	72.73 \pm 10.08	0.016*
HR 12 hours	71.9 \pm 3.64	90.33 \pm 27.79	0.001*
SBP 30 minutes	125.5 \pm 14.25	126.60 \pm 13.74	0.762 ^{NS}
DBP 30 Minutes	79.53 \pm 12.42	79.60 \pm 12.20	0.983 ^{NS}
SBP 1 hour	123.26 \pm 13.38	124.10 \pm 12.75	0.806 ^{NS}
DBP 1 hour	77.13 \pm 9.95	77.60 \pm 10.09	0.858 ^{NS}
SBP 2 hours	120.43 \pm 11.97	123.17 \pm 9.93	0.340 ^{NS}
DBP 2 hours	77.9 \pm 10.34	77.50 \pm 9.83	0.879 ^{NS}
SBP 4 hours	121.6 \pm 7.79	122.00 \pm 12.78	0.884 ^{NS}
DBP 4 hours	79.4 \pm 4.48	79.53 \pm 6.87	0.929 ^{NS}
SBP 2 hours	122.03 \pm 4.51	121.87 \pm 7.93	0.921 ^{NS}
DBP 12 hours	80.4 \pm 2.66	80.67 \pm 3.88	0.757 ^{NS}

Note: *=Significant at 0.01 level; NS: Not significant.

In the present study when heart rate was checked at the time interval of 30 minutes after surgery its mean and standard deviation in group N and group L it was 73.06 ± 9.11 and 69.33 ± 7.85 respectively and their p-value was 0.094 which means it is not significant at the significance level of 0.05. In 1 hour after surgery, the mean and standard deviation in groups N and L it was 73.96 ± 7.44 and 68.73 ± 6.39 and their p-value was 0.005 which means it is significant at the significance level of 0.05. after 2 hours it was 79.36 ± 8.73 and 71.96 ± 8.70 and its p-value was 0.002 which is significant at the significance level of 0.05. After 4 hours it was 79.26 ± 10.34 and 72.73 ± 10.08 and its p-value was 0.016 which is significant at the significance level of 0.05. after 12 hours it was 71.9 ± 3.64 and 90.33 ± 27.79 and its p-value was 0.001 which is significant at the significance level of 0.05.

In the present study when blood pressure was checked at the time interval of 30 minutes after surgery, the systolic mean and standard deviation in group N and group L it was 125.5 ± 14.25 and 126.60 ± 13.74 respectively and their p-value was 0.762 which means it is not significant at the significance level of 0.05 and diastolic mean and standard deviation in group N and L it was 79.53 ± 12.42 and 79.60 ± 12.20 and their p-value was 0.983 which means it is not significant at the significance level of 0.05. In 1 hour after surgery systolic its mean and standard deviation in groups N and L it was 123.26 ± 13.38 and 124.10 ± 12.75 and their p-value was 0.806 which is not significant at the significance level of 0.05. and diastolic mean and standard deviation in group N and L it was 77.13 ± 9.95 and 77.60 ± 10.09 and their p-value was 0.858 which means it is not significant at the significance level of 0.05.

In 2 hours after surgery, the systolic mean and standard deviation in groups N and L it was 120.43 ± 11.97 and 123.17 ± 9.93 and their p-value was 0.340 which is not significant at the significance level of 0.05 and diastolic mean and standard deviation in group N and L it was 77.9 ± 10.34 and 77.50 ± 9.83 and their p-value was 0.879 which means it is not significant at the significance level of 0.05.

In 4 hours after surgery, the systolic mean and standard deviation in groups N and L it was 121.6 ± 7.79 and 122.00 ± 12.78 and their p-value was 0.884 which is not significant at the significance level of 0.05 and diastolic mean and standard deviation in group N and L it was 79.4 ± 4.48 and 79.53 ± 6.87 and their p-value was 0.929 which means it is not significant at the significance level of 0.05.

In 12 hours after surgery, the systolic mean and standard deviation in group N and L it was 122.03 ± 4.51 and 121.87 ± 7.93 and their p-value was 0.921 which is not significant at the significance level of 0.05 and diastolic mean and standard deviation in group N and L it was 80.4 ± 2.66 and 80.67 ± 3.88 and their p-value was 0.757 which means it is not significant at the significance level (0.05).

Comparison between group N and group L

In the present study Table 7 shows that when sore throat was compared between groups N and L it was found that at a time interval of 30 minutes after surgery from group N, 7 patients got no sore throat and from group L, 20 patients got no sore throat and 22 patients from group N got mild sore throat and from group L, 10 patients got a mild sore throat. 1 patient from group N got a moderate sore throat and none from group L got so. None of the patients got severe sore throats at a time interval of 30 minutes after surgery. A *Chi-square* test was applied and its value was 11.76 and its p-value was 0.008 which means it was significant.

Table 7 Comparison between group N and group L

	Sore throat	Group N	Group L	Chi-square	p-value
30 minutes	No	7 (23.33%)	20 (66.67%)	11.76	0.008*
	Mild	22 (73.34%)	10 (33.33%)		
	Moderate	1 (3.33%)	0 (0.0%)		
	Severe	0 (0.0%)	0 (0.0%)		
1 hour	No	11 (36.67%)	21 (70.0%)	7.13	0.028*
	Mild	18 (60.0%)	9 (30.0%)		
	Moderate	1 (3.33%)	0 (0.0%)		
	Severe	0 (0.0%)	0 (0.0%)		
2 hour	No	13 (43.33%)	22 (73.33%)	5.55	0.019*
	Mild	17 (56.67%)	8 (26.67%)		
	Moderate	0 (0.0%)	0 (0.0%)		

	Severe	0 (0.0%)	0 (0.0%)		
4 hour	No	14 (46.67%)	23 (76.67%)	5.71	0.017*
	Mild	16 (53.33%)	7 (23.33%)		
	Moderate	0 (0.0%)	0 (0.0%)		
	Severe	0 (0.0%)	0 (0.0%)		
12 hour	No	14 (46.67%)	24 (80.0%)	7.18	0.007*
	Mild	16 (53.33%)	6 (20.0%)		
	Moderate	0 (0.0%)	0 (0.0%)		
	Severe	0 (0.0%)	0 (0.0%)		
Note: *=Significant at 0.01 level					

In the present study when sore throat was compared between groups N and L it was found that at a time interval of 1 hour after surgery from group N, 11 patients got no sore throat and from group L, 21 patients got no sore throat and 18 patients from group N got a mild sore throat and from group L, 9 patients got a mild sore throat. 1 patient from group N got a moderate sore throat and none from group L got so. None of the patients got severe sore throat at a time interval of 1 hour after surgery. The *Chi-square* test was applied and its value was 7.13 and its p-value was 0.028 which means it was significant.

In the present study when sore throat was compared between groups N and L it was found that at a time interval of 2 hours after surgery from group N, 13 patients got no sore throat and from group L, 22 patients got no sore throat and 17 patients from group N got a mild sore throat and from group L, 8 patients got a mild sore throat. None of the patients from group N and group L got a moderate sore throat. None of the patients got a severe sore throat at a time interval of 2 after surgery. The *Chi-square* test was applied and its value was 5.55 and its p-value was 0.019 which means it was significant.

In the present study when sore throat was compared between groups N and L it was found that at a time interval of 4 hours after surgery from group N, 14 patients got no sore throat and from group L, 23 patients got no sore throat and 16 patients from group N got a mild sore throat and from group L, 7 patients got mild sore throat. None of the patients from group N and group L got a moderate sore throat. None of the patients got a severe sore throat at a time interval of 4 hours after surgery. The *Chi-square* test was applied and its value was 5.71 and its p-value was 0.017 which means it was significant.

In the present study when sore throat was compared between groups N and L it was found that at a time interval of 12 hours after surgery from group N, 14 patients got no sore throat and from group L, 24 patients had no sore throat and 16 patients from group N got a mild sore throat and from group L, 6 patients got a mild sore throat. None of the patients from group N and group L got a moderate sore throat. None of the patients got a severe sore throat at a time interval of 12 hours after surgery. The *Chi-square* test was applied and its value was 7.18 and its p-value was 0.007 which means it was significant.

DISCUSSION

In this study, by applying various statistical tools to primary data collected through simple random sampling it is found that the sore throat of the participant changes after surgery with different time intervals in group N. At 30 minutes 7 patients had no sore throat and 22 patients had a mild sore throat, 1 patient got moderate and none of the patients got a severe sore throat. At 1 hour 11 patients got no sore throat and 18 patients got a mild sore throat, 1 patient got moderate and no other patients got a severe sore throat. At 2 hours 13 patients got no sore throat and 17 patients had a mild sore throat and none of the patients had moderate or severe sore throat. At 4 hours 14 patients got no sore throat and 16 patients got mild sore throat and none of the patients got a moderate or severe sore throat. At

12 hours 14 patients got no sore throat and 16 patients got mild sore throat and none of the patient got moderate or severe sore throat. Similarly, in group L. At 30 minutes 20 patients got no sore throat and 10 patients got mild sore throat and none of the patient got moderate or severe sore throat. At 1 hour 21 patients had no sore throat and 9 patients had mild sore throat none of the patients got moderate or severe sore throat. At 2 hours 22 patients had no sore throat and 8 patients got mild sore throat none of the patients got moderate or severe sore throat. At 4 hours 23 patients had no sore throat and 7 patients got mild sore throat none of the patients got moderate or severe sore throat. At 12 hours 24 patients had no sore throat and 6 patients had mild sore throat none of the patients got moderate or severe sore throat. In short, group L showed less sore throat than group N.

Takhelmayum et al. undertook a study to determine how intracuff lignocaine, both plain and alkalinized, affected the prevention of postoperative sore throat. Even though the ordinary lignocaine group performed better than the air cuff group, the incidence of sore throat and other throat diseases was much lower in the alkaline lignocaine group. They concluded that using intracuff alkalinized lignocaine increased endotracheal tube tolerance by lowering the rate of emergence. So, did our study show sore throat in patients of group N having more sore throat as the cuff of the endotracheal tube was filled with air and no lubricant was applied, on the other hand, group L patients showed less sore throat as lignocaine jelly was applied on the cuff of the endotracheal tube so our study was correlating.

Tae Gan Ryu et al. researched to determine the effects of a foam-cuffed endotracheal tube on a postoperative sore throat. The study found that the incidence of sore throat was 20% in the foam-filled cuff group and 50% in the air-filled cuff group. The sore throat was less severe in the foam-filled cuff group than in the air-filled cuff group. The sore throat became more severe in the air-filled cuff group as intra-cuff pressure increased. Our study was based on lignocaine jelly applied cuff and air-filled cuff. We also find that in air-filled cuffs patients show more sore throats than in lubricated lignocaine jelly cuffs. So, our study is somewhat correlating.

Helena et al. carried out randomized clinical research to assess the efficacy and safety of air-filled endotracheal tube cuffs to those loaded with alkalinized lidocaine and they found that Alkalinized lidocaine-filled ET cuffs decreased the incidence of postoperative sore throat and low ET discomfort by preventing high cuff pressures during N₂O anaesthesia Alkalinized lidocaine-filled ET cuffs, therefore, appear to be less harmful than those filled with regular air. Our study included lignocaine jelly on cuffs of ET tube and air-filled cuffs we also found that applying lignocaine jelly on the cuff of ET tube reduces sore throat incidence in patients more than of the air-filled cuff as air-filled cuff pressure increases with inhalation anaesthetics so our study was somewhat correlating.

CONCLUSION

In this study, we can conclude that applying lignocaine jelly on cuff of the endotracheal tube reduces the chances of sore throat in patients in the postoperative period compared to those without lignocaine jelly.

LIMITATIONS OF THE STUDY

The study's major limitations include a small sample size, a short period, and sole use of lignocaine jelly for lubrication.

REFERENCES

- [1] Szmuk P, et al. A brief history of tracheostomy and tracheal intubation, from the Bronze Age to the Space Age. *Intensive Care Medicine*. Vol.34, No.2, 2008, pp. 222-228.
- [2] Haas CF, et al. Endotracheal tubes: Old and new. *Respiratory Care*. Vol.59, No.6, 2014, pp. 933-952.
- [3] Litman RS and Maxwell LG. Cuffed versus uncuffed endotracheal tubes in pediatric anaesthesia: The debate should finally end. *Anesthesiology*. Vol.118, No.3, 2013, pp. 500-501.
- [4] Salem MR. Verification of endotracheal tube position. *Anesthesiology Clinics of North America*. Vol.19, No.4, 2001, pp. 813-839.
- [5] Lorente L, Blot S and Rello J. Evidence on measures for the prevention of ventilator-associated pneumonia. *European Respiratory Journal*. Vol.30, No.6, 2007, pp. 1193-1207.
- [6] Dobrin P and Canfield T. Cuffed endotracheal tubes: Mucosal pressures and tracheal wall blood flow. *The American Journal of Surgery*. Vol.133, No.3, 1977, pp. 562-568.

- [7] Kim D, et al. The changes of endotracheal tube cuff pressure by the position change from supine to prone and the flexion and extension of head. *Korean Journal of Anesthesiology*. Vol.68, No.1, 2015, pp. 27-31.
- [8] El-Boghdady K, Bailey CR and Wiles MD. Postoperative sore throat: A systematic review. *Anaesthesia*. Vol. 71, No.6, 2016, pp. 706-717.
- [9] Safdar N, Crnich CJ and Maki DG. The pathogenesis of ventilator-associated pneumonia: its relevance to developing effective strategies for prevention. *Respiratory Care*. Vol.50, No.6, 2005, pp. 725-739.