ORIGINAL RESEARCH PAPER
Volume - 15 | Issue - 03 | March - 2026 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARISON BETWEEN LIGNOCAINE JELLY VERSUS BETAMETHASONE GEL APPLIED OVER ENDOTRACHEAL TUBE TO REDUCE POSTOPERATIVE SORE THROAT, COUGH AND HOARSENESS OF VOICE.

Anaesthesiology

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ABSTRACT

Background: Postoperative sore throat (POST), cough, and hoarseness of voice are common and distressing complications following endotracheal intubation. Various pharmacological methods have been explored to reduce these symptoms, including topical lignocaine jelly and corticosteroids like betamethasone gel.

KEYWORDS

Postoperative sore throat, Betamethasone gel, Lignocaine jelly, Endotracheal intubation, Hoarseness of voice.

INTRODUCTION

Endotracheal intubation is an essential component of general anesthesia for airway protection and controlled ventilation. Despite advancements in airway equipment, postoperative sore throat (POST), cough, and hoarseness of voice remain frequent complications, with reported incidence ranging from 6.6% to 90%. These symptoms result from mucosal injury, inflammation, and edema of the laryngo-tracheal structures. Multiple factors influence the incidence of POST, including tube size, cuff pressure, duration of intubation, and repeated airway manipulation. Pharmacological interventions such as topical lignocaine and corticosteroids have been evaluated to reduce airway inflammation. Betamethasone, a potent corticosteroid, has anti-inflammatory properties that may reduce post-intubation airway sequelae more effectively than lignocaine.

AIMS AND OBJECTIVES OF THE STUDY

This study aims to compare effect of lignocaine jelly with betamethasone gel applied over endotracheal tube on postoperative sore throat, cough and hoarseness of voice.

Primary Objective:

To compare the incidence and severity of postoperative complications like sore throat, cough and hoarseness of voice.

Secondary Objective:

To study perioperative and postoperative hemodynamic parameters.

MATERIALS AND METHODS

Drug: 2% Lignocaine jelly and 0.05% Betamethasone gel.

Methodology:

Following the Institutional Ethics committee approval and registration in clinical trial and obtaining written & informed consent of patient and patient's relatives study was done. Patients fulfilling the inclusion criteria were randomized using odd-even method into two equal groups, as per the application of jelly on the ET tube cuff:

Group L-2% lignocaine jelly.
Group B-0.05% betamethasone gel

After thorough pre- anaesthetic assessment with necessary investigations; patient were shifted inside operation theatre, and attaches all the monitors. Baseline parameters of patients were recorded, including electrocardiography (ECG),pulse oximetry (SpO2), non-invasive blood pressure (NIBP) heart rate (HR), respiratory rate (RR). Intravenous line were secured with appropriate size intravenous cannula.

Pre oxygenation was given with face mask with oxygen of 8 to 10 litters for 2-3 minutes via bain's circuit. Premedication of Inj. Glycopyrrolate 0.004mg/kg IV Inj. Ondansetron 0.15 mg/kg IV, Inj. Fentanyl 2 microgram/kg IV were given. Induction with Inj. Propofol 2-3mg/kg IV, Inj. Suxamethonium 2mg/kg IV were given and endotracheal intubation was done by resident doctor in anaesthesia having experience of 1.5yrs. Disposable Single use PVC tracheal tubes, having low pressure - high volume cuff of size 8.0 mm and 7.0 mm was used for male and female patients respectively. The endotracheal tubes lubricated from distal end of the cuff to a distance of 15 cm from the tip with 1-2 ml either 0.05% betamethasone gel or 2% lignocaine jelly applied uniformly with aseptic precautions as per the group allocation. The cuff of endotracheal tube was inflated with air, just enough to prevent air leakage. After insertion bilateral air entry was checked and tube fixed. Afterwards patients were maintained on O2+N2O+Sevoflurane and adequate muscle relaxation achieved with Inj. Atracurium 0.5mg/kg IV LD and 0.15mg/kg. IV intermittent dose. The surgery was started and intraoperative monitoring of hemodynamic parameters like HR, NIBP, SpO2, EtCO2, were monitored throughout the procedure at 15min interval and documented. After completion of procedure thorough Oral and ET suction was done and Inj. Glycopyrrolate 0.008mg/kg IV Inj. Neostigmine 0.05 mg/kg IV for reversal given, cuff deflated, endotracheal tube removed after fulfilling the extubation criteria. All patients were transferred to the post-anesthesia care unit, and Assessment of post-operative sore throat, cough and hoarseness of voice were observed and noted at immediately after extubation ,1, 4, 6, 12, 24, 36 and 48 hours post extubation and rated using scoring system for sore throat cough and hoarseness along with post-operative hemodynamics. Score ranges from 0 to 3. The maximum achievable score is 9. Score 0- No cough, sore throat and evidence of hoarseness at any time since the operation. Score 3 -Severe cough, sore throat and hoarseness that is easily noted at the time of interview.

SCORING SYSTEM FOR SORE THROAT, COUGH AND HOARSENESS.

SORE THROAT
0 No sore throat at any time since the operation
1 Minimal [less than what is seen in common cold]
2 Moderate [like what is seen in common cold]
3 Severe [more than what is seen in common cold]

COUGH
0 No cough at any time since the operation
1 Minimal cough or scratchy throat
2 Moderate cough
3 Severe cough

HOARSENESS
0 No evidence of hoarseness at any time since the operation
1 No evidence of hoarseness at the time of interview
1 Hoarseness at the time of interview noted by patient only
2 Hoarseness that is easily recognizable at the time of interview

Demographic Profile

S.No	Demographic Characteristics	Group L	Group B	p-value
1	Age in years	38.08 (±11.62)	46.6 (± 12.70)	0.095
2	Weight in Kgs	60.05 (±7.96)	60.20 (± 6.67)	0.839
3	Male/Female	10/15	11/14	0.774
4	ASA 1, 2 & 3	17/8/0	11/11/3	0.093

By conventional criteria the age distribution, weight, gender and ASA PS Classification status between the group L and group B among study

subjects is considered to be statistically NOT significant since p > 0.05.

Intraoperative And Postoperative Hemodynamic Parameters

In our study, there was no statistically significant difference between the heart rate, SBP, DBP, mean BP, SpO2 and EtCO2. (p-value >0.05). No statistically significant difference was found in all of the aforementioned parameters in the studies conducted by Masoomeh Tabari et al.[6] (2013), routine monitoring of hemodynamic variables such as non-invasive blood pressure (NIBP), electrocardiography (ECG), oxygen saturation (SpO□), and capnography was employed throughout the perioperative period. Despite the inclusion of intravenous dexamethasone as one of the interventions, which could theoretically affect heart rate and blood pressure, no significant differences in hemodynamic stability were observed across the betamethasone, dexamethasone, and control groups.

Other studies, such as those by Raja M. et al. (2019),[10] Ajjapa AK et al. (2020),[11] Boddu S. et al. (2021)[12], Sajin CS et al. (2024),[15] and Elumalai VK et al. (2022),[13] did not explicitly report hemodynamic outcomes. Overall, the data suggest that the application of betamethasone gel, as well as its comparators such as lignocaine jelly, KY jelly, and IV dexamethasone, do not significantly impact intra-operative or post-operative hemodynamic stability.

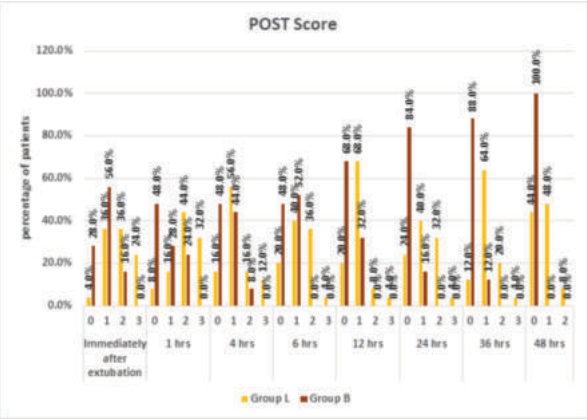

Figure 1: Comparison Of Incidence Of Sore Throat In Both Group

Immediately after extubation: Group L had fewer severe scores: 24% had score 3, while Group B had none with score 3. However, Group B had more patients with score 0 (28%) compared to Group L (4%).

From 1 to 12 hours: Group B consistently showed higher rates of score 0 (indicating no sore throat), especially at 12 hrs (68% vs 20%). Group L had higher proportions of scores 2 and 3 at early time points (1–6 hrs), suggesting more discomfort.

From 24 to 48 hours: The majority of Group B had score 0 (no sore throat) from 24 hrs onward, reaching 100% at 48 hrs. Group L still had residual sore throat symptoms, with some patients showing scores of 1 and 2 even at 48 hrs.

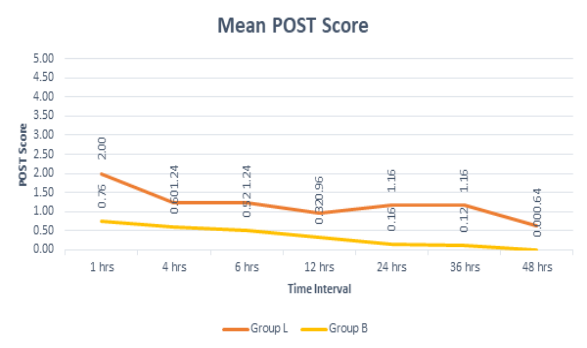

Figure 2: Comparison Of Severity Score Of Sore Throat In Both Groups

POST score decreased constantly in both the groups after extubation though it was more in Group L compared to Group B. The difference in POST score till 48 hrs post extubation among the two groups was statistically highly significant.

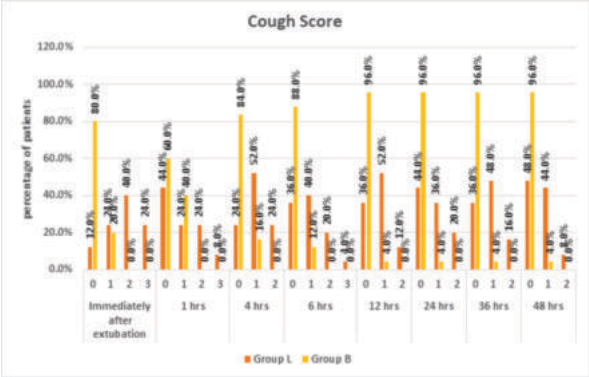

Figure 3 : Comparison Of Incidence Of Cough In Both Group

Immediately after extubation: 80% of Group B had no cough (score 0), compared to only 12% of Group L. Higher cough scores (2 or 3) were only observed in Group L.

Progression over time (1 hr to 48 hrs): Group B consistently showed better recovery, with a high percentage of patients having no cough at each time point. Group L continued to exhibit milder to moderate cough in a larger portion of patients across all intervals.

By 48 hrs, 96% of Group B had no cough, compared to 48% in Group L.

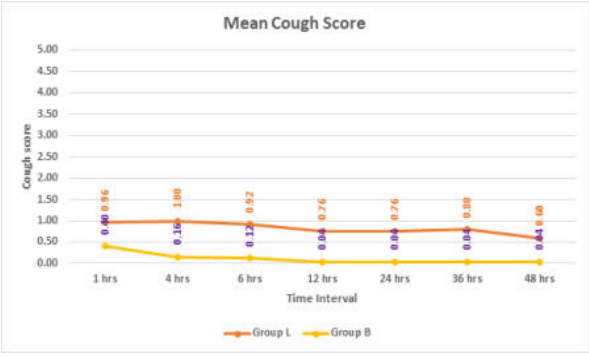

Figure 4: Comparison Of Severity Score Of Cough In Both Groups

Cough score decreased constantly in both the groups after extubation though it was more in Group L compared to Group B. The difference in cough score till 48 hrs post extubation among the two groups was statistically highly significant.

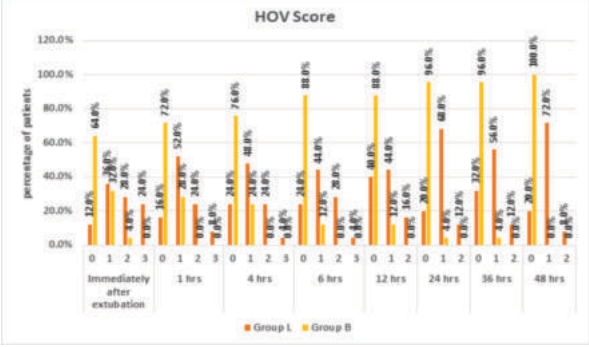

Figure 5 : Comparison Of Incidence Of Hoarseness Of Voice In Both Group

Immediately After Extubation: Group B had significantly more patients with no hoarseness (Score 0 = 64%) than Group L (12%). Group L showed higher severity scores (2 and 3) than Group B.

At 1, 4, 6, and 12 Hours Post-Extubation: Group B consistently had a higher percentage of patients with Score 0 (no hoarseness) compared to Group L. In contrast, Group L had more patients with Score 1 or higher, suggesting more persistent hoarseness.

Beyond 24 Hours (24, 36, 48 Hours): Group B maintained a strong

trend of full recovery, with up to 100% having Score 0 by 48 hours. Group L still showed residual hoarseness, with many patients having Score 1 even at 48 hours (72%).

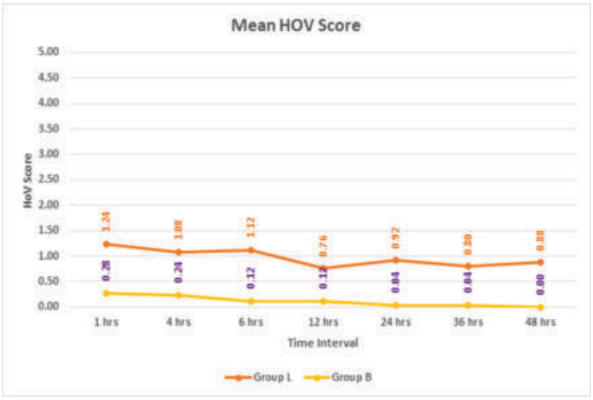

Figure 6: Comparison Of Severity Score Of HOV In Both Groups

Hoarseness of voice(HOV) score decreased constantly in both the groups after extubation though it was more in Group L compared to Group B. The difference in Hoarseness of voice(HOV) score till 48 hrs post extubation among the two groups was statistically highly significant.

DISCUSSION

Endotracheal intubation using a cuffed endotracheal tube (ETT) is the gold standard for airway management but commonly causes airway mucosal irritation, leading to postoperative sore throat (POST), cough, and hoarseness of voice (HOV). Lubricating the ETT cuff with lignocaine jelly or betamethasone gel may reduce these complications.

In this prospective randomized comparative study of 50 adult patients (25 per group), betamethasone gel significantly reduced the incidence and severity of POST, cough, and HOV compared to lignocaine jelly at all postoperative time intervals up to 48 hours. A higher proportion of patients in the betamethasone group were symptom-free, with statistically significant lower mean scores for sore throat, cough, and hoarseness.

These findings are consistent with multiple previous studies, which also demonstrate that betamethasone gel is more effective than lignocaine, KY jelly, and even intravenous dexamethasone in minimizing post-extubation airway complications. Thus, topical betamethasone appears to be a superior option for reducing postoperative airway morbidity following endotracheal intubation.

From my study, I conclude that

The results of this study demonstrate that betamethasone gel applied over the endotracheal tube is significantly more effective than lignocaine jelly in reducing the incidence and severity of postoperative sore throat, cough, and hoarseness of voice. Betamethasone gel provided superior and sustained relief, with a rapid decrease in symptoms and minimal side effects. Lignocaine jelly, although commonly used, was less effective, particularly beyond the immediate postoperative period.

Therefore, betamethasone gel is recommended as a more efficacious agent to enhance patient comfort and reduce postoperative airway complications.

There was no significant hemodynamic changes in both the groups.

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