

A Randomized Controlled Trial Comparing 2% Lidocaine Jelly and K-Y Jelly in Reducing Postoperative Sore Throat After Laryngeal Mask Airway Use

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Received: 01-06-2026 / Revised: 25-07-2026 / Accepted: 12-08-2026

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Conflict of interest: Nil

Abstract

Background: Postoperative sore throat is a common complication following airway manipulation, particularly after laryngeal mask airway (LMA) insertion. Lubrication of the LMA cuff is routinely performed to reduce mucosal trauma, but the optimal lubricant remains unclear. Lidocaine jelly possesses local anaesthetic properties, whereas K-Y jelly is an inert, water-soluble lubricant with minimal irritant potential.

Aim: To compare the effectiveness of 2% lidocaine jelly and K-Y jelly in reducing postoperative sore throat following LMA insertion during general anaesthesia.

Materials and Methods: This double-blinded, randomized controlled trial included 60 ASA I–II patients aged 18–60 years undergoing elective surgery. Participants were allocated into two groups of 30 each: Group I received K-Y jelly and Group II received 2% lidocaine jelly for LMA cuff lubrication. Standardized anaesthetic protocols were followed. Hemodynamic parameters were monitored intraoperatively. Postoperative assessments for sore throat, cough, and hoarseness were performed at 0, 6, 12, and 24 hours after LMA removal.

Results: The incidence of immediate postoperative sore throat at 0 hours was significantly higher in the lidocaine group (30%) compared with none in the K-Y group. At 6 hours, mild sore throat persisted in 6.7% of Group I and 13.3% of Group II, with no significant difference. No sore throat was present at 12 or 24 hours in either group. Postoperative cough and hoarseness were infrequent and showed no significant differences between groups. Hemodynamic variables were comparable throughout.

Conclusion: K-Y jelly significantly reduced the incidence of immediate postoperative sore throat compared with 2% lidocaine jelly, while both lubricants demonstrated similar effects on cough, hoarseness, and hemodynamic stability. K-Y jelly may therefore be preferred as a safe and effective lubricant for LMA insertion.

Keywords: Airway; Anaesthesia; Laryngeal mask airway; Lubricant; Sore throat.

DOI: 10.25258/ijcpr.18.8.296

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Introduction

Tracheal intubation can injure the airway mucosa and commonly leads to postoperative sore throat, hoarseness, and cough. Among these, sore throat is one of the most frequent and discomfiting complaints after general anaesthesia, often influencing overall patient satisfaction and recovery. Numerous lubricants have been evaluated to minimize this complication, though their effectiveness varies. Supraglottic airway devices provide an alternative to endotracheal intubation by enabling ventilation without the need for direct laryngoscopy. These devices offer multiple advantages, including easier insertion, better patient

tolerance, reduced hemodynamic fluctuations, less airway manipulation, and a lower incidence of airway-related complications such as sore throat. The laryngeal mask airway (LMA), introduced in 1981, rapidly gained global acceptance and prompted the development of several other supraglottic devices such as the ProSeal LMA, laryngeal tube, oesophageal–tracheal combitube, intubating LMA, and cuffed oropharyngeal airway. The Ambu® AuraOnce™ is a single-use, PVC-based supraglottic airway device with a preformed 90° curvature that facilitates smooth insertion and positions the cuff optimally over the upper

oesophageal sphincter. Its thin cuff and open bowl design, which lacks aperture bars, allow for effective sealing and direct alignment with the glottic opening.

Airway complications—especially sore throat, cough, and hoarseness—are known to occur more frequently during extubation than intubation. Achieving a smooth, cough-free emergence from anaesthesia is therefore an important objective in perioperative care.

Lidocaine 2% jelly is frequently used for airway lubrication owing to its local anaesthetic effect, which can help reduce postoperative sore throat. K-Y Jelly, a water-soluble and biologically inert lubricant containing cellulose derivatives, is also widely used because it is non-irritant, colourless, and easy to remove.

This study aims to compare the effectiveness of 2% lidocaine jelly and K-Y Jelly applied to the laryngeal mask airway cuff in reducing postoperative sore throat in patients undergoing elective surgeries under general anaesthesia.

Review of Literature: Nandia et al. (2014) conducted a randomized study evaluating the prophylactic effects of lidocaine and beclomethasone jelly in reducing postoperative sore throat and cough following orotracheal intubation. Ninety women aged 18–60 years undergoing elective mastoidectomy were assigned to either beclomethasone jelly or 2% lidocaine jelly for endotracheal tube lubrication. Postoperative assessments at 1 and 24 hours showed that lidocaine jelly was more effective than saline in reducing emergence coughing and sore throat.

McHardy et al. (2014) compared 2% lidocaine jelly with K-Y jelly in preventing postoperative sore throat and cough after endotracheal intubation. Ninety-two ASA I–II patients scheduled for elective surgery were randomized to receive either lubricant. Patients were evaluated at 1, 12, and 24 hours post-extubation. The study concluded that lidocaine jelly was superior to saline in reducing the incidence of postoperative coughing and sore throat.

Sathish Kumar et al. (2014) investigated the effects of ketamine, aspirin, and 2% lignocaine jelly on postoperative sore throat. One hundred fifty patients were randomized into three groups: ketamine gargle, soluble aspirin gargle, and lignocaine spray before intubation. Incidences of sore throat and cough were recorded at 2, 4, and 24 hours. All three interventions demonstrated similar effectiveness in reducing postoperative sore throat, with minimal hoarseness across all groups.

Moideen Abdul Kadhar et al. (2014) performed a randomized double-blind trial assessing lignocaine jelly, dexamethasone spray, and placebo for prevention of post-extubation sore throat. Three

hundred patients undergoing general anaesthesia with endotracheal intubation were assigned to dexamethasone, lignocaine, or saline spray groups. Postoperative assessment between 12–24 hours showed no significant benefit of either lignocaine or dexamethasone in reducing sore throat or hoarseness.

Pyung-Gul Park et al. (2014) compared normal saline, water-soluble gel, and 2% lidocaine gel as lubricants for the SLIPA™ device in patients undergoing minor surgery. One hundred twenty-three patients were evaluated postoperatively at recovery, 6–12 hours, and 18–24 hours. The study found that 2% lidocaine gel reduced the incidence of postoperative sore throat more effectively than saline or water-soluble gel.

Aim: To compare the efficacy of 2% lidocaine jelly and K-Y jelly in reducing postoperative sore throat after laryngeal mask airway insertion during general anaesthesia.

Objectives

1. To compare the incidence of postoperative sore throat between the two lubricants.
2. To assess postoperative cough and hoarseness of voice in both groups.
3. To compare hemodynamic responses associated with laryngeal mask airway insertion.

Materials and Methods

Study design: This study was conducted as a double-blinded, randomized controlled trial.

Participants: Sixty patients, aged 18–60 years, classified as American Society of Anesthesiologists (ASA) physical status I or II, and scheduled for elective surgeries under general anaesthesia were recruited.

Exclusion criteria: Patients were excluded if they were undergoing oral or pharyngeal surgery, required a nasogastric tube or throat pack, had an upper respiratory infection, were on steroid therapy, had known hypersensitivity to study drugs, anticipated difficult airway, surgery expected to last more than 120 minutes, declined participation, or required more than one attempt at LMA insertion.

Randomization and grouping: Participants were randomized into two equal groups (n = 30) using a computer-generated sequence:

- **Group I:** LMA lubricated with K-Y Jelly
- **Group II:** LMA lubricated with 2% lidocaine jelly

Anaesthetic protocol

All patients underwent pre-anaesthetic assessment and provided informed written consent. Baseline heart rate, non-invasive blood pressure, oxygen saturation, and respiratory rate were recorded.

Intravenous access was secured, and patients were premedicated with midazolam 20 mcg/kg and glycopyrrolate 10 mcg/kg.

The appropriate size of the Ambu® AuraOnce™ LMA was selected based on patient weight. The cuff was lubricated according to group allocation under sterile conditions. Anaesthesia was induced with fentanyl 2 mcg/kg, propofol 2 mg/kg, and atracurium 0.5 mg/kg. After three minutes of mask ventilation, the LMA was inserted by an experienced anaesthesiologist, and the cuff inflated to ensure an adequate seal. Anaesthesia was maintained with oxygen–air mixture (50:50), isoflurane 1%, and supplemental atracurium as needed. Hemodynamic parameters were monitored after induction and every 15 minutes thereafter. At the end of surgery, residual neuromuscular blockade was reversed with neostigmine 0.05 mg/kg and glycopyrrolate 0.01 mg/kg. Oral suctioning was performed, and the

LMA was removed once the patient regained full consciousness.

Outcome measures: Postoperative assessment included the presence of sore throat, cough, and hoarseness of voice at 0, 6, 12, and 24 hours following LMA removal. Sore throat and cough were graded as absent, mild, moderate, or severe. Hemodynamic variables—heart rate, systolic blood pressure, diastolic blood pressure, and mean arterial pressure—were recorded throughout the perioperative period.

Sample size: Assuming a postoperative sore throat incidence of 1% versus 30% between the groups, with a significance level of 0.05 and 80% study power, a sample size of 30 subjects per group was determined using Stata version 13.

Results and Findings

Table 1: Demographic Characteristics

Variable	Group I (K-Y Jelly)	Group II (2% Lidocaine Jelly)	p-value	Interpretation
Age (years)	46.7% (20–40) 53.3% (41–60)	40% (20–40) 60% (41–60)	0.795	No significant difference
Gender	Male: 46.7% Female: 53.3%	Female: 100%	<0.001	Gender distribution differs

Age was comparable, ensuring group homogeneity. The gender imbalance reflects sampling variation but does not affect outcome measures.

Table 2: Hemodynamic Parameters Summary

Parameter	Result Summary	Interpretation
Heart Rate	No significant differences between groups at any time point.	Both lubricants produced similar hemodynamic responses to LMA insertion.
Systolic BP	No significant differences observed.	Both groups tolerated LMA insertion similarly.
Diastolic BP	No meaningful differences at any interval.	No hemodynamic advantage for either lubricant.
Mean Arterial Pressure	Comparable trends in both groups.	Lubricant type did not influence perioperative stability.

Heart rate, systolic blood pressure, diastolic blood pressure, and mean arterial pressure remained stable throughout the procedure in both groups, with no statistically significant differences observed.

Table 3: Postoperative Sore Throat

Time	Group I	Group II	p-value	Interpretation
0 hours	0%	30%	0.002	Significantly higher in lidocaine group
6 hours	6.7%	13.3%	0.335	Not significant
12 hours	0%	0%	-	None reported
24 hours	0%	0%	-	None reported

Immediate postoperative sore throat was significantly more common with 2% lidocaine jelly. K-Y Jelly performed better in preventing early discomfort.

Table 4: Postoperative Cough

Time	Group I	Group II	p-value	Interpretation
0 hours	0%	6.7%	0.491	Not significant
6 hours	0%	6.7%	0.491	Not significant
12 hours	0%	0%	-	None reported
24 hours	6.7%	0%	0.491	Not significant

Both lubricants performed similarly regarding postoperative cough. Differences were small and statistically insignificant.

Table 5: Hoarseness of Voice

Time	Group I	Group II	Interpretation
0 hours	0%	0%	None reported
6 hours	0%	0%	None reported
12 hours	0%	0%	None reported
24 hours	0%	0%	None reported

Hoarseness did not occur in either group at any time point, demonstrating that both lubricants are safe with respect to vocal cord irritation.

Interpretation

- K-Y Jelly significantly reduced immediate postoperative sore throat compared with 2% lidocaine jelly.
- No significant difference was observed in postoperative cough or hoarseness between the two groups.
- Hemodynamic parameters remained stable and comparable, indicating that the lubricant type does not influence cardiovascular response.
- By 12 hours post-extubation, both groups showed complete resolution of sore throat, cough, and hoarseness.

K-Y Jelly is more effective than 2% lidocaine jelly in preventing early postoperative sore throat after laryngeal mask airway insertion, with similar safety and hemodynamic profiles.

Discussion

In this randomized controlled study, the efficacy of 2% lidocaine jelly and K-Y jelly applied to the laryngeal mask airway cuff was compared in reducing postoperative sore throat and related airway symptoms. The principal finding of this study is that K-Y jelly was associated with a significantly lower incidence of immediate postoperative sore throat compared with 2% lidocaine jelly. Hemodynamic responses, postoperative cough, and hoarseness of voice, however, were similar between the two groups.

Postoperative sore throat remains a common minor complication following airway instrumentation and is often attributed to mucosal irritation or local trauma during device insertion. In our study, 30% of patients who received lidocaine jelly experienced sore throat at 0 hours, whereas none in the K-Y group reported this symptom. This supports previous evidence indicating that lidocaine-containing lubricants may not always reduce throat discomfort and, in some cases, may contribute to mucosal irritation. The results align with studies suggesting that inert, water-soluble lubricants such as K-Y jelly may minimize friction and mechanical irritation more effectively than pharmacologically active agents. At 6 hours, the incidence of sore throat remained higher in the lidocaine group, although the difference was not statistically significant. By 12

and 24 hours, both groups were free of sore throat, indicating that the effect of the lubricant is most relevant in the immediate postoperative period. This reinforces the importance of selecting an appropriate lubricant capable of minimizing early airway discomfort, which is often the period associated with highest patient dissatisfaction.

Postoperative cough was infrequent and showed no significant differences between the two groups at any time point. Similarly, no patient developed hoarseness of voice in either group. These findings indicate that the type of lubricant used does not significantly influence deeper airway symptoms or vocal cord-related irritation. The absence of hoarseness may be attributed to the supraglottic nature of the device, which avoids direct contact with the vocal cords.

Hemodynamic parameters remained comparable between the two groups throughout the perioperative period, suggesting that neither lubricant altered the physiological response to laryngeal mask airway insertion. This stability supports existing literature indicating that LMA placement is generally associated with minimal cardiovascular stimulation compared to endotracheal intubation.

The findings of this study demonstrate that K-Y jelly offers a distinct advantage in reducing immediate postoperative sore throat without compromising airway safety or hemodynamic stability. While lidocaine jelly offers local anesthetic action, the present results suggest that its potential irritant effect may offset the intended benefit when used on the LMA cuff. Given the simplicity, safety profile, and effectiveness of K-Y jelly, it may be preferred as a routine lubricant for LMA insertion.

Conclusion

This randomized controlled study demonstrated that lubrication of the laryngeal mask airway cuff with K-Y jelly significantly reduced the incidence of immediate postoperative sore throat when compared with 2% lidocaine jelly in patients undergoing elective procedures under general anaesthesia. Both lubricants showed comparable effects on postoperative cough and hoarseness of voice, and hemodynamic responses remained stable and similar between the groups. These findings suggest that K-

Y jelly, a biologically inert and water-soluble lubricant, is a more effective option for minimizing early postoperative throat discomfort following LMA insertion. Its simplicity, safety, and effectiveness support its routine use in clinical practice for airway device lubrication.

Acknowledgement: Dr. Pavish

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