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Effect of Intravenous Lidocaine on Emergence Cough Following Elective Ear, Nose and Throat Surgery

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Abstract **Original Research Article**

Background: Emergence cough during extubation is a common airway complication after general anaesthesia and may contribute to adverse hemodynamic responses and postoperative morbidity, particularly in patients undergoing ENT surgery. Therefore, this study was conducted to evaluate the effect of intravenous lidocaine on emergence cough following elective ear, nose, and throat (ENT) surgery. ***Methods:*** This prospective comparative study was conducted at the Department of Anaesthesiology, MH Samorita Hospital and Medical College, Dhaka, Bangladesh, from February 2025 to January 2026. A total of 150 adult patients undergoing elective ENT surgery under general anaesthesia were equally allocated to the intravenous lidocaine and control groups. The effect of intravenous lidocaine on emergence cough and perioperative outcomes was evaluated using SPSS version 26.0, with $p < 0.05$ considered statistically significant. ***Results:*** The groups were comparable at baseline and intraoperatively (all $p > 0.05$). Intravenous lidocaine significantly reduced emergence cough (36.0% vs. 68.0%, $p < 0.001$) and postoperative sore throat (16.0% vs. 32.0%, $p = 0.028$), while providing better hemodynamic stability during extubation (all $p < 0.001$). Extubation time, postoperative recovery, and other complications were similar between the groups (all $p > 0.05$). ***Conclusion:*** Intravenous lidocaine is a safe and effective adjunct that reduces emergence cough, improves hemodynamic stability during extubation, and decreases postoperative sore throat without delaying postoperative recovery in patients undergoing elective ENT surgery.

Keywords: Intravenous Lidocaine, Emergence Cough, Ear, Nose and Throat Surgery.

INTRODUCTION

General anaesthesia with endotracheal intubation is an integral component of modern surgical practice, with more than 230 million major surgical procedures performed worldwide each year and a substantial proportion of patients requiring airway management with a tracheal tube (TT) [1]. Under normal physiological conditions, coughing serves as an essential protective airway reflex by clearing foreign material from the respiratory tract and helping to prevent aspiration [2]. Nevertheless, cough during tracheal extubation is a frequent event in surgical patients, with a reported incidence ranging from 15% to 94%, and may lead to a variety of potentially serious perioperative complications [3]. Extubation-related cough has been associated with hypertension, tachycardia, laryngospasm, increased intracranial, intra-abdominal, and intraocular pressures, as well as wound dehiscence [4,5]. Isoflurane remains a commonly used inhalational anaesthetic agent for the induction and maintenance of general anaesthesia; however, because of its pungency and irritant effect on the airway, it has been linked to a higher incidence of coughing, breath-holding, and laryngospasm during airway manipulation [6].

The consequences of coughing during emergence from anaesthesia may be particularly significant in certain surgical settings. Forceful coughing

during extubation has been reported to contribute to neck haematoma formation following carotid endarterectomy, increased intracranial pressure after craniotomy [7], and vitreous extrusion during ophthalmic surgery. Although uncommon, severe cardiovascular complications, including arrhythmias and cardiovascular collapse, have also been described [8]. In addition, postoperative sore throat is a frequent complication after general anaesthesia, occurring in approximately 21%–72% of patients, and represents an important cause of patient discomfort, dissatisfaction, and delayed return to normal daily activities [9]. Airway-related complications are of particular concern during ear, nose, and throat (ENT) surgery. Following partial laryngectomy (PLE), placement of a tracheostomy tube (TOT) is necessary to maintain ventilation. Owing to the rich vagal innervation of the airway, insertion of the TOT may provoke marked airway responsiveness manifested by severe coughing and excessive airway secretions [10]. Bucking during emergence may further increase heart rate, blood pressure, and jugular arterial and venous pressures, thereby increasing the risk of incisional bleeding. At present, no universally accepted or recommended therapeutic strategy exists for preventing postoperative coughing and bucking after PLE.

A variety of approaches have been investigated to minimize airway complications during emergence from anaesthesia, including extubation under deep anaesthesia, intravenous opioids [11], and topical or intracuff administration of lidocaine. Among these strategies, intravenous lidocaine is widely used by anaesthetists as a prophylactic measure because of its potential to suppress airway reflexes. Although its exact mechanism of action has not been fully elucidated, proposed mechanisms include suppression of airway sensory C fibres [12], reduction of neural discharge from peripheral nerve fibres, and selective inhibition of pain transmission within the spinal cord. Intravenous lidocaine has demonstrated effectiveness in reducing extubation-induced cough at doses ranging from 0.5 to 2 mg/kg while producing relatively few adverse effects. Nevertheless, despite its generally favourable safety profile, its administration requires caution because systemic toxicity, including local anaesthetic toxicity, has been reported, and excessive sedation may delay recovery of consciousness and potentially increase the risk of pulmonary aspiration [14]. Lidocaine also exerts antitussive effects by blocking voltage-gated sodium channels in sensory neurons, thereby inhibiting the initiation and propagation of neuronal action potentials [15]. In addition, suppression of cough may result from depression of brainstem reflex pathways or from anaesthetizing peripheral cough receptors located in the trachea and hypopharynx.

Although several small randomized controlled trials (RCTs) have evaluated intravenous lidocaine in specific surgical populations [16], the generalizability of these findings to the broader population of patients undergoing general anaesthesia with tracheal intubation remains uncertain. Furthermore, concerns regarding adverse effects, including seizures and arrhythmias [27], continue to warrant careful evaluation of its clinical use. Alternative methods have also been explored, including the modified endotracheal tube (LITA™ tube), which was specifically designed to reduce coughing during emergence from general anaesthesia. [1] Previous reports have suggested that laryngotracheal administration of lidocaine through the LITA™ tube can suppress coughing in 60% to 100% of patients. Gonzalez *et al.,*[18] reported complete suppression of cough in 36% of patients receiving topical lidocaine via the LITA™ tube compared with only 4% of controls, without prolonging the time to extubation. Despite these encouraging findings, no consensus has yet been established regarding the optimal strategy for preventing postoperative coughing and bucking, particularly in patients undergoing ENT procedures. Therefore, the present study was undertaken to evaluate the effect of intravenous lidocaine on emergence cough following elective ear, nose, and throat (ENT) surgery, with particular emphasis on its impact on cough incidence and severity, extubation characteristics, hemodynamic responses, postoperative recovery, and postoperative complications.

Objective

- To evaluate the effect of intravenous lidocaine on emergence cough following elective ear, nose, and throat (ENT) surgery.

METHODOLOGY & MATERIALS

This prospective comparative study was conducted at the Department of Anaesthesiology, MH Samorita Hospital and Medical College, Dhaka, Bangladesh, from February 2025 to January 2026. A total of 150 adult patients scheduled for elective ear, nose, and throat (ENT) surgery under general anaesthesia were enrolled and randomly allocated in a 1:1 ratio to the intravenous lidocaine group or the control group according to predefined inclusion and exclusion criteria. The study was designed to evaluate the effect of intravenous lidocaine on emergence cough following extubation, as well as its impact on extubation characteristics, hemodynamic responses, postoperative recovery, and postoperative complications.

Inclusion Criteria

i. Adult patients aged 18 years and above.
ii. Patients scheduled for elective ear, nose, and throat (ENT) surgery under general anaesthesia with endotracheal intubation.
iii. Patients classified as American Society of Anesthesiologists (ASA) Physical Status I or II.
iv. Patients who provided written informed consent to participate in the study.

Exclusion Criteria

i. Patients with known hypersensitivity or contraindication to lidocaine.
ii. Patients with an anticipated difficult airway or those requiring repeated endotracheal intubation attempts.
iii. Patients with significant cardiovascular, hepatic, renal, or neurological disease.
iv. Patients with bronchial asthma, chronic obstructive pulmonary disease (COPD), recent upper respiratory tract infection, or other chronic respiratory disorders associated with increased airway reactivity.
v. Patients receiving medications that could influence the cough reflex or interact with lidocaine (e.g., antiarrhythmic drugs).
vi. Pregnant or lactating women.
vii. Patients undergoing emergency ENT surgery.
viii. Patients who declined to participate or withdrew consent during the study.

Anaesthetic Procedure

All patients underwent a standardized anaesthetic protocol. Standard monitoring, including electrocardiography (ECG), non-invasive blood pressure (NIBP), pulse oximetry (SpO_2), and capnography, was applied throughout the procedure. General anaesthesia was induced using standard intravenous anaesthetic agents, followed by endotracheal intubation facilitated with an appropriate neuromuscular blocking agent. Anaesthesia was maintained with inhalational anaesthetic agents and supplemental analgesics according to the institutional protocol. At the completion of surgery and before extubation, patients in the intervention group received intravenous lidocaine at a dose of 1.5 mg/kg administered slowly over 60 seconds approximately 90 seconds before extubation, whereas patients in the control group received an equivalent volume of normal saline in an identical manner. Neuromuscular blockade was reversed after completion of surgery, and extubation was performed after fulfillment of the standard extubation criteria.

Outcome Measures

The primary outcome was the incidence and severity of emergence cough following extubation. Cough severity was graded using a four-point scale: Grade 0 (no cough), Grade 1 (mild cough; single cough), Grade 2 (moderate cough; sustained coughing lasting <5 seconds), and Grade 3 (severe cough; persistent coughing lasting >5 seconds or repeated forceful coughing). Secondary outcome measures included intraoperative characteristics (duration of surgery and anaesthesia), extubation characteristics (extubation time), hemodynamic parameters during extubation (heart rate, systolic blood pressure, diastolic blood pressure, and mean arterial pressure), postoperative recovery characteristics (time to eye opening, time to obey verbal commands, and duration of stay in the post-anaesthesia care unit [PACU]), and postoperative complications, including sore throat, hoarseness, laryngospasm, postoperative nausea and vomiting, and oxygen desaturation (SpO_2 <95%).

Data Collection and Statistical Analysis

Data were collected using a structured case record form and analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0. Continuous variables were expressed as mean ± standard deviation (SD) and compared using the independent-samples Student's *t*-test. Categorical variables were expressed as frequencies and percentages and compared using the Chi-square test or Fisher's exact test, as appropriate. A two-tailed *p*-value of <0.05 was considered statistically significant.

Informed Consent

Written informed consent was obtained from all participants before enrollment after explaining the purpose, procedures, potential benefits, and possible risks of the study. Participation was entirely voluntary, and participants were informed of their right to withdraw from the study at any time without affecting their medical care. The confidentiality and anonymity of all participant information were maintained throughout the study.

RESULTS

Table 1: Baseline Demographic and Clinical Characteristics of the Study Participants (N = 150)

Variable		Lidocaine (n = 75)	Control (n = 75)	Total (N = 150)	p-value
Age (years), Mean ± SD		38.9 ± 10.8	39.5 ± 11.3	39.2 ± 11.0	0.742
Sex	Male	43 (57.3)	41 (54.7)	84 (56.0)	0.738
	Female	32 (42.7)	34 (45.3)	66 (44.0)	
BMI (kg/m²), Mean ± SD		24.4 ± 2.8	24.7 ± 3.1	24.6 ± 2.9	0.563
ASA Physical Status	ASA I	49 (65.3)	46 (61.3)	95 (63.3)	0.719
	ASA II	26 (34.7)	29 (38.7)	55 (36.7)	

The mean age of the study participants was 39.2 ± 11.0 years. The majority of participants were male (84 patients, 56.0%), while females accounted for 66 patients (44.0%). The overall mean body mass index (BMI) was 24.6 ± 2.9 kg/m². Most participants were classified as ASA Physical Status I (95 patients, 63.3%), whereas 55 patients (36.7%) were classified as ASA Physical Status II. There were no statistically significant differences between the lidocaine and control groups regarding age, sex, BMI, or ASA physical status (all p > 0.05).

Table 2: Distribution of Types of Elective Ear, Nose and Throat (ENT) Surgery Among the Study Participants (N = 150)

Type of Surgery	Lidocaine (n = 75)	Control (n = 75)	Total (N = 150)	p-value
Septoplasty	24 (32.0)	23 (30.7)	47 (31.3)	0.992
FESS	18 (24.0)	20 (26.7)	38 (25.3)	
Tympanoplasty	14 (18.7)	13 (17.3)	27 (18.0)	
Mastoidectomy	10 (13.3)	11 (14.7)	21 (14.0)	
Tonsillectomy	9 (12.0)	8 (10.7)	17 (11.3)	

Septoplasty was the most frequently performed surgical procedure (47 patients, 31.3%), followed by functional endoscopic sinus surgery (FESS) (38 patients, 25.3%), tympanoplasty (27 patients, 18.0%), mastoidectomy (21 patients, 14.0%), and tonsillectomy (17 patients, 11.3%). The distribution of surgical procedures was comparable between the lidocaine and control groups, with no statistically significant difference ($p = 0.992$).

Table 3: Comparison of Intraoperative Characteristics Between the Study Groups

Variable	Lidocaine (n = 75)	Control (n = 75)	p-value
Duration of surgery (minutes)	82.7 ± 18.6	84.3 ± 19.1	0.612
Duration of anesthesia (minutes)	98.5 ± 20.8	99.7 ± 21.3	0.738

The mean duration of surgery was 82.7 ± 18.6 minutes in the lidocaine group and 84.3 ± 19.1 minutes in the control group. Similarly, the mean duration of anesthesia was 98.5 ± 20.8 minutes and 99.7 ± 21.3 minutes in the lidocaine and control groups, respectively. No statistically significant differences were observed between the groups for either intraoperative variable (all $p > 0.05$).

Table 4: Comparison of Emergence Cough Following Extubation Between the Study Groups

Variable		Lidocaine (n = 75)	Control (n = 75)	Total (N = 150)	p-value
Emergence Cough	Present	27 (36.0)	51 (68.0)	78 (52.0)	<0.001
	Absent	48 (64.0)	24 (32.0)	72 (48.0)	
Cough Grade	Grade 0 (No cough)	48 (64.0)	24 (32.0)	72 (48.0)	<0.001
	Grade 1 (Mild cough)	17 (22.7)	20 (26.7)	37 (24.7)	
	Grade 2 (Moderate cough)	8 (10.7)	22 (29.3)	30 (20.0)	
	Grade 3 (Severe cough)	2 (2.6)	9 (12.0)	11 (7.3)	

Overall, emergence cough occurred in 78 patients (52.0%) and was absent in 72 patients (48.0%). The incidence of emergence cough was significantly lower in the lidocaine group than in the control group (36.0% vs. 68.0%, $p < 0.001$). Regarding cough severity, Grade 0 (no cough) was observed in 72 patients (48.0%), Grade 1 (mild cough) in 37 patients (24.7%), Grade 2 (moderate cough) in 30 patients (20.0%), and Grade 3 (severe cough) in 11 patients (7.3%). The lidocaine group demonstrated significantly lower cough severity than the control group ($p < 0.001$).

Table 5: Comparison of Extubation Characteristics and Hemodynamic Parameters Between the Study Groups

Variable	Lidocaine (n = 75)	Control (n = 75)	p-value
Extubation time (minutes)	8.3 ± 1.7	8.6 ± 1.8	0.287
Heart Rate (beats/min)	82.4 ± 8.5	90.3 ± 9.7	<0.001
Systolic Blood Pressure (mmHg)	125.8 ± 11.6	135.4 ± 12.5	<0.001
Diastolic Blood Pressure (mmHg)	78.3 ± 7.8	84.2 ± 8.6	<0.001
Mean Arterial Pressure (mmHg)	93.4 ± 8.3	101.5 ± 9.2	<0.001

The mean extubation time was comparable between the lidocaine and control groups (8.3 ± 1.7 vs. 8.6 ± 1.8 minutes, $p = 0.287$). However, patients receiving intravenous lidocaine had significantly lower heart rate (82.4 ± 8.5 vs. 90.3 ± 9.7 beats/min), systolic blood pressure (125.8 ± 11.6 vs. 135.4 ± 12.5 mmHg), diastolic blood pressure (78.3 ± 7.8 vs. 84.2 ± 8.6 mmHg), and mean arterial pressure (93.4 ± 8.3 vs. 101.5 ± 9.2 mmHg) during extubation compared with the control group (all $p < 0.001$).

Table 6: Comparison of Postoperative Recovery Characteristics Between the Study Groups

Variable	Lidocaine (n = 75)	Control (n = 75)	p-value
Time to eye opening (minutes)	9.4 ± 2.1	9.7 ± 2.3	0.418
Time to obey verbal command (minutes)	10.2 ± 2.4	10.6 ± 2.5	0.320
PACU stay (minutes)	46.8 ± 8.9	48.1 ± 9.3	0.394

The postoperative recovery profiles were comparable between the two groups. The mean time to eye opening was 9.4 ± 2.1 minutes in the lidocaine group and 9.7 ± 2.3 minutes in the control group. Likewise, the mean time to obey verbal commands (10.2 ± 2.4 vs. 10.6 ± 2.5 minutes) and the mean duration of stay in the post-anesthesia care unit (PACU) (46.8 ± 8.9 vs. 48.1 ± 9.3 minutes) did not differ significantly between the lidocaine and control groups (all p > 0.05).

Table 7: Comparison of Postoperative Complications Between the Study Groups

Complication	Lidocaine (n=75)	Control (n=75)	p-value
Sore throat	12 (16.0)	24 (32.0)	0.028
Hoarseness	7 (9.3)	14 (18.7)	0.127
Laryngospasm	1 (1.3)	3 (4.0)	0.617
Nausea and vomiting	6 (8.0)	9 (12.0)	0.439
Oxygen desaturation (SpO_2 <95%)	2 (2.7)	4 (5.3)	0.683

Postoperative sore throat was the most common complication, occurring in 36 patients (24.0%), and was significantly less frequent in the lidocaine group than in the control group (16.0% vs. 32.0%, p = 0.028). Hoarseness occurred in 21 patients (14.0%), postoperative nausea and vomiting in 15 patients (10.0%), oxygen desaturation in 6 patients (4.0%), and laryngospasm in 4 patients (2.7%). No statistically significant differences were observed between the two groups regarding hoarseness, laryngospasm, postoperative nausea and vomiting, or oxygen desaturation (all p > 0.05).

Discussion

In this prospective comparative study conducted at the Department of Anaesthesiology, MH Samorita Hospital and Medical College, Dhaka, Bangladesh, intravenous lidocaine administered before extubation significantly reduced the incidence and severity of emergence cough among patients undergoing elective ENT surgery under general anaesthesia. Patients in the lidocaine group also demonstrated more stable hemodynamic responses during extubation and a lower incidence of postoperative sore throat, while extubation characteristics, postoperative recovery, and most other postoperative complications were comparable between the two groups.

The baseline demographic and clinical characteristics of the participants were well balanced between the lidocaine and control groups, with no statistically significant differences in age, sex, body mass index (BMI), or ASA physical status (all p > 0.05). The overall mean age of the study population was 39.2 ± 11.0 years, males constituted a slight majority (56.0%), the mean BMI was 24.6 ± 2.9 kg/m², and most participants were classified as ASA Physical Status I (63.3%). This comparability between the two groups before intervention minimized potential confounding effects on postoperative outcomes and strengthened the internal validity of the study. Similar observations were reported by Zamora *et al.,*[19], who found no significant differences among the intravenous lidocaine, topical lidocaine, intracuff lidocaine, and control groups with respect to age, sex, body weight, or ASA physical status, confirming comparable baseline characteristics before intervention. Likewise, Gladston *et al.,*[20] demonstrated that age, ASA physical status, baseline heart rate, blood pressure, and other demographic variables were statistically comparable among all study groups (p > 0.05), thereby ensuring that subsequent differences in postoperative outcomes could be attributed primarily to the intervention rather than baseline patient characteristics.

The distribution of elective ENT surgical procedures was comparable between the lidocaine and control groups, with no statistically significant difference observed (p = 0.992). Septoplasty was the most frequently performed procedure (31.3%), followed by functional endoscopic sinus surgery (25.3%), tympanoplasty (18.0%), mastoidectomy (14.0%), and tonsillectomy (11.3%). This balanced distribution of surgical procedures between the two groups minimized the potential influence of procedure-related variability on emergence cough and other perioperative outcomes, thereby strengthening the validity of the comparison between interventions. A similar pattern was reported in previous randomized studies, in which all treatment groups underwent comparable categories of ENT surgery and baseline surgical characteristics remained well balanced before intervention [20,21]. Such comparability in operative characteristics ensured that any observed differences in postoperative outcomes were more likely attributable to the administration of intravenous lidocaine rather than differences in the type of surgical procedure performed.

The intraoperative characteristics were also comparable between the lidocaine and control groups, with no statistically significant differences in the duration of surgery (82.7 ± 18.6 vs. 84.3 ± 19.1 minutes, p = 0.612) or duration of anesthesia (98.5 ± 20.8 vs. 99.7 ± 21.3 minutes, p = 0.738). These observations indicate that both groups were exposed to similar operative and anesthetic conditions, thereby minimizing the potential influence of intraoperative factors on the study outcomes and allowing a more reliable assessment of the effect of intravenous lidocaine on emergence cough. Comparable findings were described by Mraovic *et al.,*[22], who likewise reported no significant differences in

intraoperative variables, including operative and anesthetic characteristics, between the lidocaine and placebo groups before evaluating emergence cough and recovery quality. The comparable intraoperative characteristics observed in both studies strengthen the inference that differences in postoperative outcomes were primarily attributable to intravenous lidocaine rather than variations in surgical or anesthetic management.

In the present study, intravenous lidocaine significantly reduced both the incidence and severity of emergence cough following extubation. Emergence cough occurred in only 36.0% of patients in the lidocaine group compared with 68.0% in the control group ($p < 0.001$). Furthermore, patients receiving intravenous lidocaine were more likely to experience no cough (Grade 0: 64.0% vs. 32.0%) and had substantially fewer moderate and severe cough episodes (Grades 2 and 3) than those in the control group ($p < 0.001$). This observation suggests that intravenous lidocaine effectively suppresses airway reflexes during emergence from anesthesia, thereby facilitating a smoother extubation profile. Our findings are in close agreement with those of Gladston *et al.,*[20], who reported that both intravenous and intratracheal lidocaine significantly reduced post-extubation cough compared with the control group ($p < 0.001$). They also observed that Grade III cough occurred predominantly in the control group, whereas patients receiving lidocaine experienced lower cough grades, reflecting better attenuation of airway reflexes during extubation. The consistency between the two studies further supports the efficacy of intravenous lidocaine as a simple and effective strategy for minimizing emergence cough and improving the quality of recovery following elective ENT surgery.

The findings of the current study also demonstrated that intravenous lidocaine effectively attenuated the hemodynamic response associated with extubation without prolonging extubation time. Although the mean extubation time was comparable between the lidocaine and control groups (8.3 ± 1.7 vs. 8.6 ± 1.8 minutes, $p = 0.287$), patients receiving intravenous lidocaine exhibited significantly lower heart rate, systolic blood pressure, diastolic blood pressure, and mean arterial pressure during extubation (all $p < 0.001$). These results suggest that intravenous lidocaine enhances cardiovascular stability during emergence from anesthesia while preserving a comparable recovery profile. Comparable observations were reported by Shabnum *et al.,*[16], who found significantly lower heart rate, systolic blood pressure, diastolic blood pressure, and mean arterial pressure in both intravenous and intratracheal lidocaine groups compared with the placebo group ($P < 0.001$), whereas emergence times remained comparable among all groups. Similarly, Venkatesan *et al.,*[23] demonstrated that intravenous lidocaine effectively attenuated the hemodynamic response to extubation without causing any significant difference in extubation characteristics between the study groups. The agreement among these studies reinforces the beneficial role of intravenous lidocaine in maintaining hemodynamic stability during extubation without delaying emergence from anesthesia.

The postoperative recovery characteristics were comparable between the lidocaine and control groups, with no statistically significant differences observed in the time to eye opening (9.4 ± 2.1 vs. 9.7 ± 2.3 minutes, $p = 0.418$), time to obey verbal commands (10.2 ± 2.4 vs. 10.6 ± 2.5 minutes, $p = 0.320$), or duration of stay in the post-anesthesia care unit (46.8 ± 8.9 vs. 48.1 ± 9.3 minutes, $p = 0.394$). These observations demonstrate that the administration of intravenous lidocaine did not adversely affect postoperative recovery despite its beneficial effects on suppressing emergence cough and improving extubation conditions. Similar findings were reported by Mraovic *et al.,*[22], who observed that the time to extubation was approximately 8 minutes in both the intravenous lidocaine and placebo groups, demonstrating that intravenous lidocaine did not prolong emergence or recovery while significantly reducing bucking and coughing. They further reported that early recovery was smoother without delaying postoperative recovery, supporting the conclusion that intravenous lidocaine can improve the quality of emergence while preserving a normal recovery profile.

The present study also demonstrated that intravenous lidocaine was associated with a lower incidence of postoperative complications, particularly postoperative sore throat, which occurred significantly less frequently in the lidocaine group than in the control group (16.0% vs. 32.0%, $p = 0.028$). Although lower incidences of hoarseness, laryngospasm, postoperative nausea and vomiting, and oxygen desaturation were also observed in the lidocaine group, these differences did not reach statistical significance (all $p > 0.05$). These findings suggest that intravenous lidocaine not only attenuates airway reflexes during emergence but also provides a protective effect against postoperative airway discomfort without increasing adverse events. Our findings are in agreement with those of Lin *et al.,*[24], who reported that intravenous lidocaine significantly reduced the incidence of postoperative sore throat compared with saline (37.2% vs. 86.7% at 30 minutes, $p < 0.001$). They also observed significantly lower incidences and severities of postoperative hoarseness and cough in patients receiving intravenous lidocaine than in the control group. Although the reduction in hoarseness did not reach statistical significance in the present study, the overall trend toward fewer airway-related complications mirrors the findings of Lin *et al.,*[24]. Collectively, these observations support the role of intravenous lidocaine as an effective adjunct for reducing postoperative airway morbidity following endotracheal intubation, particularly in patients undergoing elective ENT surgery.

Limitations of the study

The study had a few limitations:

- This was a single-center study, which may limit the generalizability of the findings to other healthcare settings.
- The study was conducted within a limited geographical region; therefore, the findings may not be generalizable to populations from other regions.

CONCLUSION

Emergence cough is a common airway complication during recovery from general anesthesia following endotracheal intubation, particularly in patients undergoing elective ENT surgery. The present study demonstrated that intravenous lidocaine effectively reduced the incidence and severity of emergence cough while providing greater hemodynamic stability during extubation without delaying extubation or postoperative recovery. In addition, intravenous lidocaine significantly decreased the incidence of postoperative sore throat and showed a favorable safety profile, with no increase in other postoperative complications. These findings suggest that intravenous lidocaine is a simple, safe, and effective adjunct for improving the quality of emergence and minimizing airway-related complications following elective ENT surgery.

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