



## RESEARCH ARTICLE

## Pharmacological Prevention of Postoperative Sore Throat following General Anaesthesia with Endotracheal Intubation by Tramadol Gargle or 2% Topical Lidocaine Gel

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**ARTICLE INFO**

Received: May 25, 2024

Accepted: Jun 27, 2024

**Keywords**

Sore throat

Tramadol

Topical lidocaine gel

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**ABSTRACT**

Complication of sore throat is a common after anesthesia general. Various interventions have been explored to prevent this discomfort, including gargling with tramadol and application of topical lidocaine gel. Aim of study compare between effect gargling tramadol and prevention of sore throat by topical lidocaine gel after general anesthesia. Tramadol and lidocaine are two drugs that are commonly used to relieve sore throats that occur after general anesthesia. Both medications can effectively manage postoperative sore throats, but there is a debate regarding which medication is more effective. This study was done at Imam Ali Hospital, Iraq, within this period from January 2022 to October 2022. This study was applied to sixty patients list for surgery (elective) by general anesthesia. First group used 30 patients using topical Lidocaine gel 2%.The other group of 30 patients used Tramadol gargle. We obtained the symptoms of respiratory (cough, hoarseness of voice, and sore throat) one-hour post-extubating and patient satisfaction after endotracheal intubation. We found no difference (significant) in the proportions of "no sore throat," "minimal sore throat," "no cough," and "minimal cough" between the Tramadol gargle and topical lidocaine gel groups. However, the group using topical lidocaine gel had a significantly higher proportion of patients with no hoarseness compared to the group using tramadol gargle. The difference in proportions for minimal hoarseness (was not significant) between the two groups.

**INTRODUCTION**

After general anesthesia, postoperative sore throat (POST) is ranked as the eighth some more unpleasant postoperative ailment. During surgery, general anesthesia refers to the use of drugs to induce a sleep-like state in which the patient is rendered unconscious, painless, and immobile [1]. After tracheal intubation, the occurrences vary from 14.4% - 50%, and following laryngeal mask airway (LMA) insertion, they range from 5.8% to 34%.[2].

Many patients who have general anesthesia report experiencing mild to severe throat soreness in the hour, days that follow procedure. Unless it affects the patient capability to speak or if the soreness persists for more than week, there usually is no need for concern. One of two things could be causing your throat pain following surgery: dehydration or irritation from breathing support techniques. It can sometimes be the result of both. Dehydration: You could be dehydrated after surgery if your body isn't getting enough fluids to keep up with its needs. Your throat may become dry as a result of this.

When you aren't allowed to drink or eat anything prior to surgery and might only be given very little fluids and food following the procedure, dehydration might occur. [3].

Drinking fluids, such as water, will help with this issue. During general anesthesia, breathing tubes are used to numb your muscles, including your diaphragm, to maintain breathing. This calls for techniques to keep breathing while doing surgery. Often, a procedure known as intubation involves inserting an endotracheal tube down your neck and into your mouth. This tube is put into your windpipe, or trachea, and is connected to a ventilator so that oxygen can be given devoid surgery and possibly in the early recovery phases. Face mask and laryngeal mask airways (LMA) utilized occasionally. Device known as LMA have a tube rests in back of throat, above trachea's opening. Irritation or dryness in the throat may also result from these breathing tubes. The vocal cords, tongue, and throat may become irritated during the tube-insertion process. [4].

Furthermore, keeping the tube in place may irritate the throat and mouth even more. The throat, mouth, and airway may be irritated when the tube is withdrawn, and you may also have other symptoms like burning. The sore throat that results could be more serious if your condition necessitates a lengthy stay on ventilator. If a patient will require a breathing tube, ventilator for longer than 10 to 14 days, the majority of facilities will encourage them to have a tracheostomy, which entails making an incision in their neck to access the windpipe. [5].

A number of strategies have been employed to reduce post-operative pain and shock. These strategies include non-pharmacological ones like using smaller endotracheal tubes, reducing the pressure in the intracuff, lubricating with water-soluble jelly the endotracheal tube, and gently suctioning with instrumenting the airways [5]. Pharmacological strategies include beclomethasone inhalation [6], applying betamethasone gel over the endotracheal tube [7], and spraying the endotracheal tube with lidocaine or benzylamine hydrochloride [8]. In the experimental study, it was discovered that peripheral administration of NMDA (N-methyl-d-aspartate) antagonist receptor had analgesic with anti-inflammatory effects in addition to being beneficial in decreasing POST (magnesium and ketamine). [9].

Synthetic codeine analog Tramadol hydrochloride agonistically binds to  $\mu$  opioid receptors, inhibits serotonin and noradrenaline reuptake, and binds to NMDA receptors to produce a local anesthetic action.[10]. We reasoned that because tramadol has a local anesthetic impact and an antagonistic action on NMDA receptors, it would effectively alleviate sore throats prior to surgery. Lidocaine is known as local anesthetics. By clogging the signals at the nerve endings of skin, this drug reduces of pain. During medical operations, lidocaine topical jelly or ointment is applied to various body areas to create numbness or lack of feeling in patients. Additionally, it is used to treat minor wounds, scratches, sunburns, and other mild burns that cause pain and irritation. Lidocaine viscous topical solution uses for treat mouths and sore throats. Herpes zoster or shingles can induce nerve pain that can be relieved by a Lidocaine skin patch (pos therpetic neuralgia). [11].

Aim of study: compare between effect of gargling tramadol and topical lidocaine gel for prevention of sore throat after anesthesia general.

### **1. Patients and Methods:**

The Imam Ali Hospital in Iraq conducted this study from January 2022 to October 2022.

This investigation was conducted on (sixty patient) were slated to elective surgery by giving anesthesiageneral.

The patients have been divided two groups after written informed consent and clearance from the institutional ethics committee. Each group comprises (thirty cases) in both genders who were between the ages of (18 - 65) with an ASA physical status of I or II.

Patients on steroid therapy, those with a history of cough, hoarseness, or upper respiratory tract infections, as well as those who had throat packs implanted or nasogastric tubes, were not included in the study. Patients with surgery prolong, longer than (150 minute), nasotracheal intubation, difficult intubation anticipated, need for speed induction or re-intubation, neck and head surgery, lithotomy or prone operation, and hyperactive airway patients (smokers, asthmatics) were also excluded.

Thirty patients received topical lidocaine gel 2% the L (L = Lidocaine) group. This group's tracheal tubes were lubricated by lidocaine, low-pressure high-volume, single use cuff polyvinyl chloride tracheal tube. Sterile conditions maintained by spreading 2.5 ml of 2% lidocaine gel uniformly from the end distal cuff to a distance of 15 cm from the tip. The interior diameter for males and females was 8.0 mm and 7.0 mm, respectively.

T (T = Tramadol) group of 30 patients used Tramadol gargle for 5 minutes before inducing Anesthesia. The Tramadol gargle was prepared by diluting a (50mg /ml) 2ml ampule Tramadol Hydrochloride in a 15cc of normal saline using a 20cc syringe for this procedure and the patient was asked to gargle the solution that was prepared for at least (1-1.5) minutes and 5 minutes before inducing Anesthesia without swallowing it.

Intravenous ketamine (1 -2 mg / kg), propofol (1-3 mg/kg) used to induce anesthesia. Midazolam (0.03-0.3 mg/kg) was used as premedication, while atracurium (0.5 mg/kg) uses as a muscle relaxant to aid in the intubation process. Physician anesthetists with extensive experience carried out each intubation. In order to avoid an audible leak, tracheal tube cuff inflated with only enough air of room. Auscultation was used to ensure that the tube was positioned correctly, and adhesive tape was used to fix it. Atracurium 0.1 mg/kg was used to relax muscles while isoflurane and sevoflurane (0.5–3%) were used to maintain anesthesia.

Drager Fabius Tiro (Drager Medical, AG and Company KG, 23542 Lubeck, Germany) was used to mechanically control ventilation. Pulse oximetry, blood pressure, electrocardiography, and temperature are used as non-invasive monitoring. Following the procedure, the patient's protective airway reflexes were restored, satisfactory spontaneous tidal exchange achieved, airway kindly withdraw under direct vision, and any residual neuromuscular paralysis reversed with a combination of (0.02 mg/kg atropine and 0.05 mg/kg neostigmine).

In the post-anesthesia care unit, the patients were recovered; and moved to the ward. Following endotracheal intubation, we measured patient satisfaction and respiratory symptoms (cough hoarse voice and, sore throat) one hour following extubation. A four-point Verbal Numerical Rating Scale was used to score specific respiratory symptoms: None = 0, no sore throat, Mild = 1, complains just from sore throat upon request, Moderate = 2, complain of sore throat on own), Severe = 3, hoarseness or change of voice, with throat pain [12, 30, 31].

We don't examine the other data we collected in terms of statistics, but it includes demographic information, type of operation, perioperative vital signs, number of intubation attempts the patient's posture during the procedure, duration the intubation, size and type of tube uses, the anesthetic medicines utilized.

## 2. RESULT:

**Table 1: Comparison of Tramadol Gargle and Topical Lidocaine Gel Effects on Sore Throat.**

Sore throat						
Sore throat	Tramadol gargle		Topical lidocaine gel		P-Value	Sig
---	Frequency	Percent	Frequency	Percent	---	---
No sore throat	23	76.7	29	96.7	0.085	NS
Minimal sore throat	7	23.3	1	3.3	0.085	NS
Moderate sore throat	0	0	0	0	undefined	NS
Severe sore throat	0	0	0	0	undefined	NS
<b>Total</b>	30	100 %	30	100%	--	--

Table (1) show the Tramadol gargle group had 23 patients with no sore throat (76.7% of 30 cases) and 7 patients with minimal sore throat (23.3% of 30 cases). In the topical lidocaine gel group, there were 29 patients with no sore throat (96.7% of 30 cases) and 1 patient with minimal sore throat (3.3% of 30 cases). Non cases of severe sore throat or moderate reported in either group.

Based on a level of significance of  $\alpha = 0.05$ , the p-value calculated 0.085 indicates that it is greater than the significance level. Therefore, we understand there is non statistically difference significantly in the proportions of "no sore throat" , "minimal sore throat" between the Tramadol gargle and topical lidocaine gel groups.

**Table 2: Comparison of Tramadol Gargle and Topical Lidocaine Gel Effects on Cough.**

Cough						
Cough	Tramadol gargle		Topical lidocaine gel		P-value	Sig
---	Frequency	Percent	Frequency	Percent	---	---
No cough	21	70	17	56.7	0.169	NS
Minimal cough	9	30	13	43.3	0.169	NS
Moderate cough	0	0	0	0	undefined	NS
Severe cough	0	0	0	0	undefined	NS
<b>Total</b>	30	100 %	30	100 %	---	---

Table (2) show in Tramadol gargle group, 21 patients had no cough (70% of 30 cases), and 9 patients had a minimal cough (30% of 30 cases). In the topical lidocaine gel group, 17 patients had no cough (56.7% of 30 cases), and 13 patients had a minimal cough (43.3% of 30 cases). Non cases of severe or moderate cough reported in either groups.

Based on a level of significance of  $\alpha = 0.05$ , p-value calculated of 0.169 is greater than the significance level. Therefore, we understand that is non statistically difference significantly in proportions of "no cough" and "minimal cough" between Tramadol gargle and topical lidocaine gel groups.

**Table 3: Comparison of Tramadol Gargle and Topical Lidocaine Gel Effects on Hoarseness.**

Hoarseness						
Hoarseness	Topical lidocaine gel		Tramadol gargle		---	---
---	Frequency	Percent	Frequency	Percent	P-value	Sig
<b>No hoarseness</b>	28	93.3	22	73.3	0.002	S
<b>Minimal hoarseness</b>	2	6.7	8	26.7	0.254	NS
<b>Moderate hoarseness</b>	0	0	0	0	undefined	NS
<b>Severe hoarseness</b>	0	0	0	0	undefined	NS
<b>Total</b>	30	100 %	30	100 %	---	---

Table (3) show the group using topical lidocaine gel had a higher proportion of patients with no Hoarseness compared to the group using tramadol gargle. Specifically, in the tramadol group, 73.3% of patients had no Hoarseness (22 out of 30 cases) or 36.67% (22 out of 60 cases). In contrast, in the lidocaine group, 93.3% of patients had no Hoarseness (28 out of 30 cases) or 46.67% (28 out of 60 cases). The difference in proportions is significant statistically, with a p-value of 0.002, indicating no difference in the proportion of patients with no Hoarseness between two group.

For minimal Hoarseness, between the two groups. In the tramadol group no significant statistically difference, 26.7% of patients had minimal Hoarseness (8 out of 30 cases) or 13.33% (8 out of 60 cases). In the lidocaine group, 6.7% of patients had minimal Hoarseness (2 out of 30 cases) or 3.33% (2 out of 60 cases). The p-value for the difference in proportions was 0.254, indicating that there is no differences in proportion of patient with minimal Hoarseness between two group.

**Table (4): Comparison of Sore Throat Prevalence by Age Group according to topical lidocaine gel.**

Table (4) shows that highest percentage no sore throat (30%) in group age (25-34 years) and the lowest percentage (3.3%) was in the age group  $\geq 45$  years. The study found that (2) cases have a minimal sore throat which represents (6.6%) was in the age group (25-34), (35-44) and  $\geq 45$  years

Age level * Sore throat cross-tabulation						
Count						
Age Level	Sore throat				Total	P-Value
	No sor ethroat	%	Minimal sore throat	%		
less than 24	6	20	1	3.3	7	0.303
25-34	9	30	2	6.6	11	
35-44	7	23.3	2	6.6	9	
more than 45	1	3.3	2	6.6	3	
<b>Total</b>	23		7		30	

and the lowest percentage (3.3%) of minimal sore throat in group age (less 24 year).

**Table (5): Comparison of Sore Throat Prevalence by Age Group according to Tramadol Gargle.**

Age level * Sore throat cross-tabulation						
Count						
Age Level	Sore Throat				Total	P-Value
	No sore throat	%	Minimal sore throat	%		
Less than 24	10	33.3	0	0	10	0.558
25-34	9	30	1	3.3	10	
35-44	6	20	0	0	6	
Mmore than 45	4	13.3	0	0	4	
<b>Total</b>	29		1		30	

Table (5) shows that highest percentage no Sore throat (33.3%) in group of age less than 24 years and the lowest percentage (13.3%) was in the age group  $\geq 45$  years. The study found that (1) case have minimal Sore throat which represent (3.3%) was in the age group (25-34).

### 3. DISCUSSION:

After operation cough, hoarseness and sore throat are very common complainants following (general anesthesia). All the symptoms can cause discomfort and may affect the overall postoperative recovery experience of patients.

Incidence sore throat ranged (14% - 92%), cough ranged (8% - 73%), and hoarseness ranged (12% - 80%) following general anesthesia. Risk factored identified include younger age, female gender, prolonged surgery duration, and endotracheal intubation [13].

In order to decrease the cough, hoarseness, sore throat experienced after (general anesthesia), anesthesiologists and technicians administer various medications, including amides such as lidocaine, as well as opioids like tramadol. However, in order to determine the most effective medication for reducing post-general anesthesia sore throat and cough, and hoarseness, this study was conducted.

For this reason, we have worked on this research, which included 60 cases, 30 of which were using Tramadol gargle with it, and 30 other cases using Topical lidocaine gel, severity of hoarseness, sore throat, cough was measured by using Visual Analog Scale (VAS) after using both drugs and after collecting and analyzing the results, we found the following:

- The results of the sore throat scale.

The Tramadol gargle group had 23 patients with no sore throat (76.7% of 30 cases and 38.33% of 60 cases) and 7 patients with minimal sore throat (23.3% of 30 cases). In the topical lidocaine gel group, there were 29 patients with no sore throat (96.7% of 30 cases) and 1 patient with minimal sore throat (3.3% of 30 cases). Non cases of severe or moderate sore throat reported in both groups.

Based on a level of significance of ( $\alpha = 0.05$ ), calculated (p-value) of 0.085 indicates that it is greater than the significance level. Therefore, we understand no differences significant statistically in proportions of "no sore throat" and "minimal sore throat" between the Tramadol gargle and topical lidocaine gel groups.

These results agreed with Farzam, H., *et al.* (2020) [14] and Heiba, M.H., *et al.* (2012) [15], and did not agree with Yadav, M. *et al.* (2018) [16] and Xu, Y.J., *et al.* (2012) [17].

- The results of the cough scale.

In the Tramadol gargle group, 21 patients had no cough (70% of 30 cases and 35% of 60 cases), and 9 patients had a minimal cough (30% of 30 cases). In the topical lidocaine gel group, 17 patients had no cough (56.7% of 30 cases), and 13 patients had a minimal cough (43.3% of 30 cases). Non cases of severe or moderate cough reported in both groups.

Based on a level of significant of ( $\alpha = 0.05$ ), calculated (p-value) of 0.169 is more than the significance level. Therefore, we understand that no difference significant statistically in proportions "no cough" and "minimal cough" between Tramadol gargle and topical lidocaine gel groups.

These results agreed with Li, X., *et al.* (2019) [18] and Bloch, M.B., *et al.* (2012) [19] and Farzam, H., *et al.* (2020) [14] and Heiba, M.H., *et al.* (2012) [15], and did not agree with Abd Elmawgoud, A. (2013) [20] and Lin, B.F., *et al.* (2012) [21] and Yang, S.S., *et al.* (2020) [22] and D'Aragnon, F., *et al.* (2013) [23].

- The results of the hoarseness scale.

The group using topical lidocaine gel had a higher proportion of patients with no Hoarseness compared to the group using tramadol gargle. Specifically, in the tramadol group, 73.3% of patients had no Hoarseness (22 out of 30 cases) or 36.67% (22 out of 60 cases). In contrast, in the lidocaine group, 93.3% of patients had no Hoarseness (28 out of 30 cases) or 46.67% (28 out of 60 cases). The difference in proportions is significant statistically, and the p-value 0.002, indicating that there is no difference in the proportion of patients with no Hoarseness between (two group).

For minimal Hoarseness, no difference statistically significant between (two group). In tramadol group, 26.7% of patients had minimal Hoarseness (8 out of 30 cases) or 13.33% (8 out of 60 cases). In the lidocaine group, 6.7% of patients had minimal Hoarseness (2 out of 30 cases) or 3.33% (2 out of 60 cases). The p-value for the difference in proportions was 0.254, indicating that there is no differences proportion of patients complain minimal Hoarseness between the two group.

These results agreed with Farzam, H., *et al.* (2020) [14] and Heiba, M.H., *et al.* (2012) [15] and Liao, A.H.W., *et al.* (2019) [24] and Fan, Z., *et al.* (2022) [25] and Wang, Z., *et al.* (2022) [26], and did not agree with Yadav M., *et al.* (2018) [16] and Sabreen, N., *et al.* (2022) [27] and Rajan, S., *et al.* (2018) [28] and Rizvanović, N., *et al.* (2019) [29].

#### 4. CONCLUSION

We conclude is not statistically difference significantly in the proportions of "no sore throat," "minimal sore throat," "no cough," and "minimal cough" between the Tramadol gargle and topical lidocaine gel groups. However, the group using topical lidocaine gel had a significantly higher proportion of patients with no hoarseness compared to the group using tramadol gargle. The difference in proportions for minimal hoarseness between (two groups) was no statistically significant.

#### 5. Recommendations:

We recommended for using tramadol gargling or lidocaine gel preoperatively when use endotracheal intubation to reduction postoperative sore throat after anesthesia general.

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