

# Effect of Nebulized Lignocaine for the Treatment of Post-Operative Sore Throat

Tumulu Rajmohan Rao<sup>1</sup>, C Subrahmanyam<sup>2</sup>, Ankur Parmar<sup>3</sup>, Shailesh Patil<sup>4</sup>

<sup>1</sup>Senior Consultant, Department of Anesthesia, Sunshine Hospitals, Secunderabad, Telengana, India, <sup>2</sup>Consultant, Department of Anesthesia, Sunshine Hospitals, Secunderabad, Telengana, India, <sup>3</sup>Junior Consultant, Department of Anesthesia, Apollo Indraprastha Hospitals, New Delhi, India, <sup>4</sup>Junior Consultant, Department of Anesthesia, Sunshine Hospitals, Secunderabad, Telengana, India

## Abstract

**Background:** A sore throat is a side effect of general anesthesia with an endotracheal tube. The reported incidence is about 15-50% of patients after tracheal intubation and about 10-30% even with supraglottic airway devices. Several methods are used pre-operatively to reduce the incidence of post-operative sore throat (POST) with variable results.

**Materials and Methods:** We studied 50 patients prospectively to determine the effectiveness of nebulized lignocaine for the treatment of POST compared to placebo.

**Results:** Significant number of patients (23/25) reported a reduction in severity of POST in those treated with nebulized lignocaine compared to the control group (9/25) ( $P = 0.001$ ).

**Conclusion:** Nebulized lignocaine can be used as a safe and effective treatment for relief of POST resulting from endotracheal intubation. Selection of appropriate patients is important for preventing untoward incidents that may result from the treatment.

**Keywords:** Complications, Equipment, Intubation, Sore throat

## INTRODUCTION

Post-operative sore throat (POST) is a common complaint in the post-operative period after tracheal intubation and is a cause of patient dissatisfaction.<sup>1</sup> POST causes considerable patient discomfort and in certain surgical procedures may lead to post-operative surgical complication. After tracheal intubation, the incidence of the sore throat varies from 14.4% to 50%.<sup>2-9</sup>

The post-operative throat symptoms manifest as pain, dysphagia, and hoarseness after the use of tracheal intubation.

The incidence of the sore throat was higher when the cuffed endotracheal tubes were lubricated with lignocaine

ointments, as opposed to a water-soluble jelly or no lubricant at all.<sup>10</sup> However, the incidence was as high as 90% when the uncuffed tubes were lubricated with 4% lignocaine jelly, and the severity of the sore throat in these patients was significantly greater.

A comparison between intubation with dry tubes or a tube lubricated with jelly containing 1% cinchocaine suggests that the use of lubricants containing a local anesthetic may be beneficial. Of the 248 patients in that study, 39% who were intubated with a dry tube complained of sore throat on the first post-operative day compared with 24% who were intubated with a lubricated tube, which is a significant difference. The incidence decreased rapidly in both groups after the first post-operative day. A further comparison was made in 60 patients between lubrication of the tube with jelly containing cinchocaine and lubrication with the same jelly without cinchocaine.<sup>9</sup> The incidence of sore throat was 38% in the non-cinchocaine group versus 25% in the cinchocaine group, which was not statistically significant.

The effect of the application of laryngotracheal lignocaine spray on POST has also been investigated.<sup>4</sup> In the study group, after induction of anesthesia and 2 min of mask

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**Corresponding Author:** Dr. Tumulu Rajmohan Rao, 302-A, Usha Enclave, Hyderabad, Telengana, India. Phone: +91-9701185818.  
 E-mail: rajmohanrao@yahoo.co.uk

ventilation, the lignocaine spray was applied to the epiglottis, vocal cords, and trachea. Mask ventilation was then continued for a further 2 min prior to intubation. Subjects in the control group were intubated after 4 min of ventilation, with no application of spray. The incidence of the sore throat was 29.2% in the study group and 19.6% in the control group. Although this difference was not statistically significant, it was concluded that the application of lignocaine spray could not be recommended for routine use; it was further suggested that the lignocaine may be irritating or damaging to the tracheal mucosa. However, it should be noted that subjects in the study group underwent two laryngoscopies whereas those in the control group had only one.

Lubrication of endotracheal tube with 1% hydrocortisone was also found to increase the incidence of the sore throat from 50% to 90% when compared with KY jelly.<sup>8</sup> There is no study therefore that categorically demonstrates that the use of lubricating jelly containing a local anesthetic is beneficial in the reduction of POST after tracheal intubation. The application of lignocaine spray before intubation appears to increase the incidence of the sore throat, as a result of either mucosal irritation or repeated laryngoscopy.

The role of suxamethonium in the etiology of POST is unclear. It has been suggested that suxamethonium, which is known to cause post-operative skeletal muscle pain, could also lead to pain in the striated pharyngeal muscles, causing sore throat. In a study of 83 women undergoing dilatation and curettage who did not undergo tracheal intubation, the effect of administration of suxamethonium was examined.<sup>11</sup> Patients who received suxamethonium, either as a bolus or by infusion, had a significantly higher incidence of the sore throat, hoarseness, and myalgia 24-30 h post-operatively. Precurarization did not have any effect on these symptoms despite significantly reducing the incidence of muscle fasciculation. Although the patients did not undergo intubation, did not have oral airways inserted and were not suctioned, 20 patients had a nasopharyngeal airway inserted.

The highest incidence of airway use occurred in those given a bolus of suxamethonium and the incidence of the sore throat in these patients was higher than in the other groups. However, it could not be confirmed statistically that the use of the nasopharyngeal airways contributed to the higher incidence of the sore throat in patients receiving suxamethonium. These findings have not been confirmed by other investigators. Because airway management was standardized in this study, it would appear that suxamethonium does not increase the incidence of POST.

There is increasing evidence that it may be advantageous to adopt an alternative technique of laryngeal mask airway (LMA) insertion, inflation of the LMA cuff before insertion, to reduce pharyngeal trauma and POST. A high success rate was obtained when the LMA was inserted already fully inflated, but it is possible that partial inflation may have similar benefits. Lubrication of the LMA with gels containing a local anesthetic before insertion did not reduce the incidence of the sore throat;<sup>11</sup> the use of saline or KY jelly is preferred. However, the issue of whether the limitation of intracuff pressure is beneficial in reducing sore throat remains unresolved. Reduction of intracuff pressure is certainly possible without adversely affecting spontaneous tidal ventilation, but it may be necessary to maintain the pressure above a certain level to protect the larynx from contamination with oropharyngeal secretions.<sup>12</sup>

In summary, the use of smaller tracheal tubes with cuffs that have a small area of contact with the tracheal mucosa will reduce the incidence of POST. Careful control of intracuff pressure may be beneficial even for short-term intubation, and consideration should be given to using either the anesthetic gas mixture or saline to inflate the cuff. Lubricants containing local anesthetic agents are not useful and may actually increase sore throat incidence.

Numerous methods have been tried to prevent POST with variable results. Prophylactic administration of lignocaine in various forms has been tried for the prevention of POST with conflicting results.

In our study, we aim to study the safety and efficacy of nebulized lignocaine 2% post-operatively for POST.

## MATERIALS AND METHODS

It was a prospective double-blinded study and was conducted over a period of 3 months, from March to June 2008.

Approval was obtained from the Ethical Review Committee of our institution.

The age, sex, weight and "American Society of Anesthesiologists (ASA)" physical statuses of the patients were recorded on a standardized form.

In this study, after taking prior informed consent and proper counseling, 50 patients aged 20-60 years (ASA I and II) with POST were allocated randomly to two groups (C = control/T = test) 25 in each group by simple randomization using computer generated numbers in the post-anesthesia care unit.

T-group: Received 5 ml (100 mg) of 2% lignocaine as nebulization with oxygen;

C-group: Received 5 ml normal saline nebulization with oxygen.

Patients were required:

- To maintain head end elevation for at least 30 min post-treatment
- Refrain from eating or drinking during that period
- Educated to “turn over” if vomiting occurs or to spit out the secretions.

They were evaluated for severity of cough at 0 h (i.e. before treatment), 1<sup>st</sup> and 2<sup>nd</sup> h (after treatment) by using the Edmonton symptom assessment system index.<sup>13</sup>

POST was graded on a four-point scale (0-3):

- No sore throat.
- Mild sore throat.
- Moderate sore throat.
- Severe sore throat.

### Data Analysis

The statistical analysis was done using Student's *t*-test.

## RESULTS

Improvement in the severity of POST was observed after the lignocaine nebulization in 23/25 patients as compared with the control group in which only 9/25 patients reported relief ( $P = 0.001$ ) [Table 1].

The demographic data of both the groups was comparable. The treatment was well tolerated with only transient side effects like oropharyngeal numbness, bitter taste or risk of aspiration which was prevented by selecting fasting patients (elective surgeries), keeping the patients propped up and NPO for 30 min post-treatment.

## DISCUSSION

Prophylaxis for POST with intravenous (IV) lignocaine, lignocaine jelly or spray, pre-operative gargles with licorice, or ketamine or IV steroids increase cost and side effects with uncertain effects. Supraglottic airway devices are sometimes not indicated in obese or non-fasting patients.

Therapeutic modalities also have their adverse effect profiles like antihistamines (sedation and dry secretions, paradoxically worsening the cough), phenothiazines (dystonic reactions, sedation, and tardive dyskinesia), opioids

**Table 1: Comparison of test and control group symptoms**

Group	N	Age (mean±SD)	Male: Female	Symptom assessment system index		
				Score at 0 h	Score at 1 h	Score at 2 h
T-group	25	43±6.28	14:11	50	5	2
C-group	25	46±5.63	15:10	49	35	34
P value				0.1815	0.001	0.001

SD: Standard deviation

(respiratory depression), and steroids (hyperglycemia, gastric ulcers, impaired healing, immunosuppression).

Nebulized lignocaine is easily available, easily administered, cost effective, acts immediately with short duration of action and minimal systemic effects, less side effects, and no long-term residual effects.

## CONCLUSION

POST often leads to patient dissatisfaction.<sup>1</sup> It may lead to bleeding. Many prophylactic medications such as lignocaine jelly and hydrocortisone cream were actually found to increase the incidence of POST.<sup>8</sup> Therapeutic lignocaine nebulization was well tolerated by the patients and provides immediate relief, except for transient numbness of oropharynx and bitter taste in the mouth.

Our study establishes the effectiveness of lignocaine nebulization for the treatment of POST resulting from endotracheal intubation.

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