

## Original Research Article

# Use of lignocaine nebulization in post bronchoscopy patients: a study of 150 cases

Naveed Gul<sup>1</sup>, Monica Manhas<sup>2</sup>, Parmod Kalsotra<sup>1</sup>, Mehak Taban Mir<sup>3\*</sup>

<sup>1</sup>Department of Otorhinolaryngology and Head and Neck surgery, <sup>2</sup>Department of Physiology, <sup>3</sup>Department of community Medicine, Government Medical College, Jammu, Jammu and Kashmir, India

**Received:** 13 November 2020

**Revised:** 20 November 2020

**Accepted:** 21 November 2020

**\*Correspondence:**

Dr. Mehak Taban Mir,

E-mail: mehaktabanmir@gmail.com

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### ABSTRACT

**Background:** To see the role of lignocaine nebulisation and to compare its role with use of steroids and bronchodilators alone in post bronchoscopy patients.

**Methods:** In the present study, 150 patients, who underwent rigid bronchoscopy for removal of foreign body, were taken into consideration. Immediately after the rigid bronchoscopy, 100 patients were given nebulization and 50 patients were not nebulized. Out of 100 patients, 50 patients were given nebulization with steroids (budesonide) and bronchodilators (salbutamol) and 50 patients received nebulization with lignocaine 4%, steroids (budesonide) and bronchodilator (salbutamol).

**Results:** In the present study, 38 patients (25.3%) were having complications like laryngobronchial spasm, laryngeal edema, cardiac arrest and respiratory arrest. Out of the 38 patients, 15 patients (39.5%) were having laryngobronchial spasm and 23 patients (60.5%) were having laryngeal edema. Out of 15 patients who had laryngobronchial spasm only 2 (13.3%) patients, who were nebulised developed this complication, while 86.7% cases of laryngobronchial spasm developed in non-nebulised patients. Out of 23 patients who developed laryngeal oedema, only 6 (26%) patients who were nebulised developed this complication, while 74% cases of laryngeal oedema developed in non-nebulised patients.

**Conclusions:** In the present study it is concluded that both morbidity and mortality can be reduced by the use of nebulisation in the postoperative period after rigid bronchoscopy. Addition of lignocaine in nebulisation along with steroids and bronchodilators further reduces the morbidity and mortality in the postoperative period.

**Keywords:** Rigid bronchoscopy, Foreign body, Lignocaine nebulization

### INTRODUCTION

Rigid bronchoscopy is an emergency procedure carried out for both diagnostic purpose and removal of the foreign bodies from airway. Many complications like laryngobronchial spasm and laryngeal edema may occur in the post-operative period, which in turn may require tracheostomy. These complications may in turn lead to cardiac arrest and respiratory arrest.<sup>1</sup> Conventionally,

post-operative complications are reduced by the use of nebulization with the combination of steroids and bronchodilators. Combination with lignocaine nebulization thoroughly reduces rates of morbidity and mortality then nebulization with only steroid and bronchodilators. Lignocaine reduces the irritative cough, reactive secretions and hence bronchospasm and vomiting.<sup>1</sup>

The present study was done to find the role of lignocaine nebulisation in post bronchoscopy patients and to compare its role with use of steroids and bronchodilators alone.

## METHODS

### Study type, place and duration

Presented study was a prospective study, conducted at Government medical college, Jammu, from May 2017 to June 2020.

### Selection criteria

All patients who underwent rigid bronchoscopy were included in the current study.

### Procedure

In the present study, 150 patients, who underwent rigid bronchoscopy for removal of foreign body, were taken into consideration. Immediately after the rigid bronchoscopy, 100 patients were given nebulization and 50 patients were not nebulized. Out of 100 patients, 50 patients were given nebulization with steroids (budesonide) and bronchodilators (salbutamol) and 50 patients received nebulization with lignocaine 4%, steroids (budesonide) and bronchodilator (salbutamol). Post-operative complications were observed, compared and recorded between these groups of patients. In the present study, patients were divided into three groups: non nebulized group; patients who received no nebulisation, nebulized with two drugs; patients received nebulization with steroid and bronchodilator and nebulized with three drugs; patients received nebulization with lignocaine, steroid and bronchodilator.

The steroid used is budesonide and the bronchodilator used is salbutamol and they are used in the ratio of 1:1:1 diluted in 2 cc of distilled water. All patients were intubated immediately after check bronchoscopy by the oro-tracheal tube. The tracheobronchial secretions were collected from oro-tracheal tube. The amount of tracheobronchial secretions were noted and recorded in all the three groups. SPSS 23 software was used to analyse the data.

## RESULTS

In the present study, 150 patients who underwent rigid bronchoscopy for foreign body removal under general anaesthesia were considered. Out of total 150 patients, 94 (62.7%) of patients were males and 56 (37.3%) of patients were females. In the present study 20 patients (13.3%) were in the age group of 0-1 years, 95 patients (63.3%) were in the age group of >1-3 years and 35 patients (23.3%) were in the age group of >3-6 years (Table 1).

In the present study, 38 patients (25.3%) were having complications like laryngobronchial spasm, laryngeal edema, cardiac arrest and respiratory arrest as depicted in Table 2. Out of the 38 patients, 15 patients (39.5%) were having laryngobronchial spasm and 23 patients (60.5%) were having laryngeal edema. Out of 15 patients who had laryngobronchial spasm only 2 (13.3%) patients, who were nebulised developed this complication, while 86.7% cases of laryngobronchial spasm developed in non-nebulised patients. Out of 23 patients who developed laryngeal oedema, only 6 (26%) patients who were nebulised developed this complication, while 74% cases of laryngeal oedema developed in non-nebulised patients.

**Table 1: Age wise distribution of patients.**

Age group (years)	N	(%)
0-1	20	13.3
>1-3	95	63.3
>3-6	35	23.3

**Table 2: Morbidity in post bronchoscopy period.**

Morbidity	Groups		
	I	II	III
Laryngotracheal spasm	13	2	0
Laryngeal edema	17	4	2
Cardiac arrest	1	0	0
Respiratory arrest	2	0	0

Laryngeal edema was diagnosed by direct examination through fibre optic laryngoscope and mild biphasic stridor during post-operative period. Out of 100 patients, who received nebulization, 50 patients received nebulization with steroids (budesonide) and bronchodilators (salbutamol) and these belong to group II. Out of 100 patients, who received nebulisation, 50 patients' received nebulization with lignocaine 4%, budesonide and salbutamol and they constitute the group III. Out of 15 patients, who developed laryngobronchial spasm in postoperative period, 2 (13.3%) patients belong to group II, who received budesonide and salbutamol nebulisation. Rest 13 (86.7%) patients belong to group I, who didn't receive any nebulisation. None of the patients, who received nebulisation with lignocaine, budesonide and salbutamol (group III) develop any laryngobronchial spasm.

Out of 23 patients, who developed laryngeal edema, 6 (26%) patients belong to nebulisation group and 17 (74%) patients belong to non-nebulisation group. Among 6 patients that belong to nebulisation group, only 2 patients who developed laryngeal edema belong to group III (nebulised with lidocaine, budesonide and salbutamol) and 4 patients belong to group II (nebulised with budesonide and salbutamol only).

In the present study of 150 cases, 5 patients (3.3%) required tracheostomy. Out of these 5 patients, 4 patients

belong to group I (non-nebulized group) and 1 patient belongs to the nebulized group who in turn belongs to group II.

Out of 38 patients 1 (2.7%) patient had cardiac arrest and 2 (5.3%) patients had respiratory arrest and all these patients belonged to non-nebulized group.

All the non-nebulized patients had profuse secretions (>5 ml) due to inflammation and tracheo bronchial irritation, the patients who belong to group II had moderate secretions (2 to 5 ml) and the patients who belong to group III had only mild (<2 ml) tracheobronchial secretion as shown in Table 3.

**Table 3: Quantity of secretions in post bronchoscopy period.**

Nebulisation group	Quantity of tracheobronchial secretions
<b>Group I</b>	Profuse (>5 ml)
<b>Group II</b>	Moderate (2-5 ml)
<b>Group III</b>	Mild (<2 ml)

## DISCUSSION

Laryngo-tracheo-bronchial foreign bodies in children can lead to serious, sometimes fatal consequences. The longer a foreign body is in place the greater the inflammatory response to the foreign body and the greater the likelihood of complications. Hard foreign bodies, particularly metallic ones, can erode through a bronchus and lead to significant morbidity. A substantial number of patients succumb well before appropriate medical aid can be arranged.<sup>1</sup> In the present study children, between one and three years of age appear to be more vulnerable, these findings correlate with findings by other authors.<sup>2</sup> Proper history from parents reveals that often the episode of choking goes either unnoticed or unobserved especially in children who are left unattended. Even with the knowledge of foreign body inhalation, there is some times tardiness in seeking help, which defies explanation.<sup>3</sup> There is rapid fatigue of the cough reflex (sometimes within 10-15 minutes), due to adaptation of the surface sensory receptors to the presence of any foreign object.<sup>4</sup> This cough reflex is followed by an asymptomatic period that tends to create a false sense of security. When the symptoms re-manifest, by that time the choking episode is either forgotten or loses its importance.<sup>5</sup> Lignocaine 4% due to its local effect decreases the airway irritation, which in turn decreases the cough and also the reactive secretions which reduces the requirement and frequency of suction and manipulation. All these above factors along with steroid and bronchodilator reduces the edema, inflammation of airway and it in turn also reduces the morbidity and mortality.<sup>6</sup>

In the present study 38 patients (25.3%) were having complications. Out of the 38 patients, 15 patients (39.5%)

were having laryngobronchial spasm and 23 patients (60.5%) were having laryngeal edema. Out of 15 patients who had laryngobronchial spasm only 2 (13.3%) patients, who were nebulised by budesonide and salbutamol developed this complication and none of the patient's nebulised with lignocaine, budesonide and salbutamol developed this complication. 86.7% cases of laryngobronchial spasm developed in non-nebulised patients. Out of 23 patients who developed laryngeal oedema, only 6 (26%) patients who were nebulised developed this complication, while 74% cases of laryngeal oedema developed in non-nebulised patients. Only 2 patients who received nebulisation with lignocaine, budesonide and salbutamol developed laryngeal edema. These findings correlate well with the findings of other authors.<sup>1</sup>

No major complication and hence limitation was seen with the use of lignocaine nebulisation in post bronchoscopy patients.

## CONCLUSION

In the present study it is concluded that both morbidity and mortality can be reduced by the use of nebulisation in the postoperative period after rigid bronchoscopy. Addition of lignocaine in nebulisation along with salbutamol further reduces the morbidity and mortality in the postoperative period. Overall complication rate is much higher in the non-nebulization group than in nebulization group. Complications rate can be further reduced by adding lignocaine with steroids and bronchodilators. No case of mortality was seen and no need for tracheostomy in the postoperative period was required in the group that received nebulisation with lignocaine, budesonide and salbutamol.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Gul N, Manhas M, Kalsotra P, Mir MT. Use of lignocaine nebulization in post bronchoscopy patients: a study of 150 cases. *Int J Res Med Sci* 2020;8:4258-61.