Role of lignocaine nebulization in post bronchoscopy patients - A study of 200 cases

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Abstract

Rigid Bronchoscopy is carried out for the diagnosis and removal of the foreign body. The post operative period may have complications like laryngobronchial spasm, laryngeal oedema, in turn may require tracheostomy and later on may lead to cardiac arrest and respiratory arrest. These post operative complications can be drastically reduced by the use of nebulization with the combination of steroids, Bronchodilators and lignocaine. Combination with lignocaine nebulization reduces rates of morbidity and mortality effectively then nebulizing only steroid and bronchodilators. Lignocaine reduces the irritative cough, reactive secretion and also hence bronchospasm and also vomiting.

Keywords Rigid bronchoscopy • Foreign body • Lignocaine nebulization.

Methods

Prospective study of 200 patients of rigid Bronchoscopy and foreign body removal done by the same surgeon and post operative care is taken into consideration. Immediately after the foreign body removal, 150 patients were given nebulization and 50 patients were not nebulized. Out of 150 patients, 75 patients given nebulization with steroids

(Budesonide) and Bronchodilators (Salbutamol) and 75 patients received nebulization with lignocaine 4%, corticosteroids (Budesonide) and Bronchodilator (Salbutamol) and post operative complications were observed, analysed, compared and recorded between the various groups of patients. All patients received nebulization after foreign body removal.

In our series the patients were divided into three groups:

- 1) Non nebulized group: patients received no nebulization
- 2) Nebulized with two drugs: patients received nebulization with steroid and bronchodilator
- 3) 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 2cc of distilled water. The type of foreign body and the duration did not make much difference in postoperative morbidity and mortality of the post bronchoscopic patients, so it is not taken into consideration.

It is a routine practice in our setup to intubate the post bronchoscopic patients immediately after check bronchoscopy by the orotracheal tube. The amount of the tracheobronchial secretions is also reduced by the immediate post operative nebulization. The tracheobronchial secretions were collected from the orotracheal tube after the check bronchoscopy and nebulization in group II and group III and without nebulization in group.

Observation

In our this series 200 patients were undergone rigid Bronchoscopy and foreign body removal under general anesthesia. Out of total 200 patients, 132(66%) of patients were males and 68 (34 %) of patients were females. In our series 36 patients (18 %) belong to the age group of 0-1 yrs, 148 patients (74 %) belong to age group of >1-3 yrs. And 10

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Table 1 Morbidity in post Bronchoscopy

Morbidity	Group I	Group II	Group III
Laryngobronchial Spasm	20	3	1
Laryngeal Edema	22	12	5
Cardiac Arrest	2	-	-
Respiratory Arrest	4	-	-
Pneumothorax and mortality	-	-	-

Table 2 Tracheostomy and mortality in Bronchoscopy

	Group I	Group II	Group III
Tracheostomy			
Pre Operative	5(2.5 %)	-	-
Post Operative	2 (1 %)	1 (0.5%)	0
Mortality			
Pre Operative	5 (2.5%)	-	-
Post Operative	2 (1 %)	1 (0.5%)	0

Table 3 Quantity of Secretions in Post Bronchoscopy Patient.

Nebulizatoin	Episodes of Vomiting	Amount of Secretion
Group I	10	Profuse (>5ml)
Group II	4	Moderate (2-5 ml)
Group III	2	Mild (<2 ml)

patients (8 %) belong to the age group of > 3-6 yrs. In this series 27 % of the patients presented within 2-8 hrs. of foreign body inhalation, 13 % of the patients presented within >8-24 hrs, 33 % patients presented within >1-5 days, 15 % of patients presented with > 5-10 days, 8 % of patient presented within > 10-30 days, 3 % of the patients presented within > 1-6 months and 1 % of patients presented in > 6 months.

In our series 69 patients (34.5 %) were having Complications (Table 1) like laryngobronchial spasm, laryngeal edema, cardiac arrest, respiratory arrest. Out of the 69 patients, 24 patients (12 %) were having laryngo bronchial spasm and out of these 24 patients, 4 patients who were nebulized were having laryngo bronchial spasm. Out of 69 patients 39 patients (19.5 %) were having laryngeal edema and out of these 39 patients 17 patients were nebulized and 22 patients were non nebulized.

Laryngeal edema was diagnosed while intubation by direct examination and mild biphasic stridor during post operative period out of 150 patients received nebulization 75 patients received nebulization with steroids (Burdacort) and Bronchodialators (salbutamol) and these belong to group II, out of these 75 patients 12 patients (9%) were having

laryngeal edema as complications. 75 patients out of 150 patients of nebulized group received nebulization with lignocaine 4%, bronchodilator and steroid and they constitute the group III. Out of group III patient 1 patient (0.75%) had laryngyobronchial spasm and 5 patients (11.25%) have laryngeal edema as complication.

Out of 50 patients belonging to non nebulized group and constitutes the group I, 20 patient were having laryngobronchial spasm, 22 patients were having laryngeal edema, 2 patients were having cardiac arrest and 4 patients were having respiratory arrest.

Out of 200 patients of our series, 8 patients 4% required tracheostomy and out of these, 5 patients (2.5%) required preoperative tracheostomy and 3 patients (1.5%) required post operative tracheostomy, out of 3 patients, 2 patients (4%) belong to group I and 1 patient (0.75%) belong to the nebulized group who in turn belongs to group II (Table 2).

The vomiting episodes have been drastically reduced by the nebulization. In group I, 10 patients (5%) were having immediate post operative vomiting and regurgitation of the gastric fluids. The vomiting and regurgitation taken into consideration are upto 1 hrs post bronchoscopy. The vomiting is due to the effect of the anesthetic drugs, irritation of the post third of larynx especially of arytenoids and interarytenoid region and also due to the orotracheal tube. In group II patients 4 patients (2%) were having the post operative vomiting and regurgitation of gastric fluids. In group III 2 patients (1%) were having the immediate post operative vomiting.

The non nebulized patients had profuse secretions (>5ml) due to inflammation and tracheo bronchial irritation, The patients who belong to group II were having moderate amount (2 to 5ml) of tracheo bronchial secretions and the patients who belong to group III were having mild (<2ml) of tracheobronchial secretion (Table 3).

Out of 69 patients 2 (3%) patient were having Cardiac arrest and both these patients belong to non nebulized group. Out of total 69 patients having morbidity 4 patients (6.4 %) were having respiratory arrest and they also belong to non nebulized group.

As per the duration of the hospital stay the patients of nebulized group had short hospital stay. Out of 150 patients of the nebulized group, 44 patients (29.33%) were having the hospital stay of 0-3 days. Out of 44 nebulized patients having hospital stay of 0-3 days, 17 patients (22.67%) belong to group II, 27 patients (36%) belong to group III. 81 patients (54%) were having the hospital stay of >3-5 days. Out of 81 patients having hospital stay of >3-5 days, 33 patients (44%) belong to group II, rest 48 patients (64%) belong to group III. and 25 patients (16.67%) were having hospital stay of >5 days. Out of 25 patients belonging to the patients having

hospital stay of >5 days, all 25 patients (33.33%) belong group II.

Out of 50 patients belonging to group I, 17 patients (34%) had hospital stay of >3-5 days and 33 patients (66%) were having hospital stay of >5 days.

Total mortality of series was 8 (4%) and out of these 8 patients, 5 patients were having mortality which was peroperative and 3 patients were having mortality which was post operative and out of these 3 patients, 2 (1%) of patients they were non nebulized and 1 patient (0.5%) was nebulized group and this patient belong to group II. Out of total 8 patients 7 patients were non nebulized and out of these 5 patients didn't get the time for the nebulization and 2 patients belong to group I (see table 2). Group III has no mortality rate.

Discussion

Laryngo-tracheo-bronchial foreign bodies in children can lead to serious, sometimes fatal consequences. We found it difficult to estimate the extent of mortality and feel that a substantial number of patients succumb well before appropriate medical aid can be arranged. Children, especially those between one and three years of age appear to be more vulnerable-an observation corroborated by other reporters¹.

Interrogation of the parents reveals that often the episode of choking goes either unappreciated or unobserved especially in children who are left unattended. Even with the knowledge of foreign body inhalation, there is some times tardiness in seeking help², which defies explanation. The rapid fatigue of the cough reflex (sometimes within 10-15 minutes), perhaps due to adaptation of the surface sensory receptors to the presence of any alien object³. Is followed by an asymptomatic phase that tends to create a false sense of security. By the time of remanifestation of the symptoms, the choking episode is either forgotten⁴ or loses its import.

Lignocaine 4% due to its local effect decreases the airway irritation which in turn decreases the cough and also the reactive secretion which reduces the requirement and frequency of suction and manipulation⁵. All these above factors reduces along with steroid and bronchodilator reduces the oedema, inflammation of airway and it in turn also reduces the morbidity and mortality⁶.

Conclusion

Morbidity and mortality of bronchoscopy can be reduced by use of nebulization. Drastic reduction of morbidity observed

in nebulization in group nebulized by steroids, bronchodilators, and lignocaine. No mortality was observed in patients who get time for nebulization and nebulization with lignocaine, bronchodilators and steroids, overall decrease in morbidity and mortality in this group nebulized with three drugs is correlated to effect of lignocaine which decreases the irritative laryngotracheobronchitis, due to its surface anesthetic effect. It also decreases the use of suction and manipulation which reduces the incidence of laryngeal irritation which causes regurgitation and vomiting. It also decreases the incidence of laryngeal edema which may require tracheostomy and may later on lead to cardiorespiratory arrest and death in some cases.

Overall complications are more in the non nebulization group than in nebulization group. In nebulized group complications rate can be reduced by adding lignocaine with steroids and bronchodilators other than nebulizing with only steroids and bronchodilators.

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