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Comparison of laryngeal mask airway & endotracheal intubation in pediatric age group: A cross sectional study

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Abstract

The laryngeal mask airway, it is a supraglottic airway instrument developed by British Anesthesiologist Dr. Archie Brain. Initially it was designed only for the use in the operating room for the purpose of elective ventilation; it is a proved alternative to bag-valve-mask ventilation, freeing the hands of the provider with the benefit of less gastric distention. Initially used primarily in the operating room setting, the laryngeal mask airway has more recently come into use in the emergency situation as a very important device for the treatment of the difficult airway. The objective of the study was To compare the various parameters that occur during laryngeal mask airway insertion and endotracheal intubation for surgical procedures under general anesthesia. In the present study, 18 children's belongs to age group of 2 to 6 years and 32 children's belongs to age group of 7 to 10 years. Totally 29 children's were male and 21 children's were female. In LMA group, LMA insertion was graded easy in 97% of patient and difficult in 3% cases. In none of the case was LMA insertion impossible (0%). In the ETT group, endotracheal intubation was easy in 85% of patients and difficult in 15% of patients. In none of the patients was endotracheal intubation impossible. In the LMA group, LMA was placed correctly in the first attempt in 94% patients and was placed correctly in the 2nd attempt in 6%. The ETT was placed in the first attempt in 80% patients and was placed correctly in the 2nd attempt in 20%. According to the results of our study, laryngeal mask airway it is device of choice for elective outpatient surgeries in pediatric patients due to its lesser hemodynamic changes and complications, ease of insertion in cases where endotracheal tube insertion gets difficult and also faster insertion.

Keywords: Laryngeal Mask Airway, Endotracheal Intubation, Pediatric Age Group

Introduction

The laryngeal mask airway, it is a supraglottic airway instrument developed by British Anesthesiologist Dr. Archie Brain. Initially it was designed only for the use in the operating room for the purpose of elective ventilation; it is a proved alternative to bag-valve-mask ventilation, freeing the hands of the provider with the benefit of less gastric distention. Initially used primarily in the operating room setting, the laryngeal mask airway has more recently come into use in the emergency situation as an very important device for the treatment of the difficult airway^[1-3].

The laryngeal mask airway is designed like a large endotracheal tube on the proximal end that connects to an elliptical mask on the distal end. It is designed to sit in the patient's hypopharynx and cover the supraglottic structures, thereby allowing relative isolation of the trachea. The patient should be obtunded and unresponsive before one of these devices is placed.

In case of pediatric anesthesia environment, selection of the correct size of an endotracheal tube is the main issues because an inappropriate endotracheal tube causes tracheal edema or damage. Airway edema induced by multiple attempts of intubation might result in hypoxemia. In order to avoid the complications of multiple attempts of intubation, many methods which can precisely predict the appropriate size of an endotracheal tube have been suggested^[4].

Few anesthesiologists used to select the endotracheal tube size based on their personal experience, some other anesthesiologists would select the appropriate endotracheal tube size by calculating formulae which are based on the children's demographic data such as weight, height or age, sex. Usually, the Cole's equation is still the best considered as one of the methods in spite of its poor outcome^[5].

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Objectives

To compare the various parameters that occur during laryngeal mask airway insertion and endotracheal intubation for surgical procedures under general anesthesia.

Methodology

The study was conducted in 50 pediatric patients aged between 2-10 years undergoing elective surgeries under general anesthesia in a tertiary care hospital, Bengaluru, between January 2018 to December 2018.

The parameters compared are:

- Ease of insertion and number of attempts
- Postoperative complications.

Results

Table 1: age & sex wise distribution of cases

Age group	Sex	Ett	Lma
2 to 6 Years	Male	06	05
	Female	04	03
7 to 10 Years	Male	08	10
	Female	07	07
Total		25	25

In the present study, 18 children's belongs to age group of 2 to 6 years and 32 children's belongs to age group of 7 to 10 years. Totally 29 children's were male and 21 children's were female.

Table 2: Ease of Insertion

	LMA	ETT
Easy [E]	97%	85%
Difficult [D]	3%	15%
Impossible [I]	0%	0%

In LMA group, LMA insertion was graded easy in 97% of patient and difficult in 3% cases. In none of the case was LMA insertion impossible (0%). In the ETT group, endotracheal intubation was easy in 85% of patients and difficult in 15% of patients. In none of the patients was endotracheal intubation impossible.

Table 3: Number of attempts in placement of LMA/ETT

0	LMA	ETT
1	94%	80%
2	6%	20%

In the LMA group, LMA was placed correctly in the first attempt in 94% patients and was placed correctly in the 2nd attempt in 6%. The ETT was placed in the first attempt in 80% patients and was placed correctly in the 2nd attempt in 20%.

Table 4: Postoperative Complications

	ETT	LMA
Cough	14 cases	Nil
Sore throat	05 cases	Nil
Spasm	Nil	Nil

Post operative complication such as cough were seen in 14 cases of ETT usage and sore throat were seen in 5 cases of usage and spasm were not seen in any cases.

Discussion

In the present study, 18 children's belongs to age group of 2 to 6 years and 32 children's belongs to age group of 7 to 10 years. Totally 29 children's were male and 21 children's were female.

In LMA group, LMA insertion was graded easy in 97% of patient and difficult in 3% cases. In none of the case was LMA insertion impossible (0%). In the ETT group, endotracheal intubation was easy in 85% of patients and difficult in 15% of patients. In none of the patients was endotracheal intubation impossible. In the LMA group, LMA was placed correctly in the first attempt in 94% patients and was placed correctly in the 2nd attempt in 6%. The ETT was placed in the first attempt in 80% patients and was placed correctly in the 2nd attempt in 20%.

M. Lopez-Gil *et al.* reported that laryngeal mask airway place was successful in 90% patients at first attempt. Lalwani *et al.* conducted a study using proseal laryngeal mask airway and endotracheal tube and reported that the PLMA was inserted in 83.33% patients in first attempt. They concluded that the different morphology of PLMA from the Classic LMA and after deflation the semirigid distal end of drain tube of PLMA may contribute to difficult insertion with a PLMA [6, 7].

Post operative complication such as cough were seen in 14 cases of ETT usage and sore throat were seen in 5 cases of usage and spasm were not seen in any cases.

According to a study by Patki A. laryngeal mask airway versus endotracheal tube in pediatric airway management noted that laryngeal mask airway provides lesser perioperative airway complications than endotracheal tube. The laryngeal mask airway was seen to have three advantages over endotracheal tube in the form of lesser incidence of cough on emergence, lower incidence of postoperative sore throat and lower incidence of postoperative vomiting. It was seen to offer no advantages over endotracheal tube in incidence of bronchospasm or laryngospasm during emergence [8].

According to a study by Alan R T *et al.*, they suggested that if decision is made to proceed with anesthesia for patients with uncomplicated upper respiratory tract infection then laryngeal mask airway provides an acceptable alternative to the endotracheal tube [9].

According to a study by Jamail SN *et al.*, they also noted lesser chances of postoperative complications with laryngeal mask airway than endotracheal tube. They postulated that since laryngeal mask airway is less invasive airway instrument the postoperative respiratory complications were less as compared to endotracheal tube [10].

Conclusion

According to the results of our study, laryngeal mask airway it is device of choice for elective outpatient surgeries in pediatric patients due to its lesser hemodynamic changes and complications, ease of insertion in cases where endotracheal tube insertion gets difficult and also faster insertion.

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