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COMPARATIVE STUDY ON AIRWAY SEAL PRESSURE OF I-GEL WITH LMA FOR MINOR SURGICAL PROCEDURES

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ABSTRACT **BACKGROUND:** The laryngeal mask airway has revolutionized the management of patients who would previously have received anesthesia by facemask enabling the anesthetist to both hands free. The increasing emphasis on "day care anesthesia" has led to greater use of laryngeal mask airway, I-gel as an alternative to face mask and in some cases for conventional tracheal intubation AIM The aim of my study is to compare the airway seal pressure of LMA and I-gel in patients undergoing minor surgical procedures under total intravenous anesthesia METHODS. Group A- Patients in whom I-gel was used Group B Patients in whom LMA was used. Oropharyngeal seal pressure was noted by closing the expiratory valve at a fixed gas flow of 5L per minute and recording the airway pressure at which the gas leaked into the mouth Manometric stability test is one of the most reliable test RESULTS. In the I-gel group the airway seal pressure achieved was superior when compared to LMA These results were found to be statistically significant CONCLUSION The oropharyngeal seal pressure was higher in I-gel than LMA group

KEYWORDS : Laryngeal mask airway, oropharyngeal seal pressure, I-gel, anaesthesia.

1.INTRODUCTION

The endotracheal intubation has a long history as one of the most widely accepted techniques in anesthetic practice, but it is not without complications, most of which arises from the need to visualize and penetrate the laryngeal opening.[1]

The laryngeal mask was designed primarily as a means of offering some of the advantages of endotracheal intubation while avoiding a fundamental disadvantage of visualization of the vocal cords and forcing them apart.[2]The laryngeal mask airway has revolutionized the management of patients who would previously have received anesthesia by facemask enabling the anesthetist to both hands free. The increasing emphasis on "day care anesthesia" has led to greater use of laryngeal mask airway, I-gel as an alternative to face mask and in some cases fo conventional tracheal intubation.[3] Today the ubiquitous use of LMA and similar supraglottic devices provides new possibilities in the approach to the airway.[4]

Supraglottic devices, in particular the LMA and the combitube have been recommended as rescue airways in "cannot intubate, cannot ventilate" scenario. The LMA has been recommended at five places in the ASA task force algorithm on the management of the difficult airway either as a ventilating device or as a conduit for endotracheal intubation.The primary disadvantage of classic LMA is the high incidence of gastric insufflations and aspiration. I-gel is a relatively new supraglottic airway device with a drain tube to minimize the risk of gastric insufflations and aspiration. I-gel is a supraglottic airway device with greater stability while positioning, high seal pressure, has high success rate at first insertion.[5] The present study is carefully designed with utmost care to compare oropharyngeal airway pressure in I-gel and LMA in patients undergoing minor surgical procedures under total intravenous anaesthesia.

2.AIM

The aim of my study is to compare the airway seal pressure of LMA and I-gel in patients undergoing minor surgical procedures under total intravenous anesthesia.

3.MATERIALS AND METHODS

This study was conducted in the elective operating theatres of Govt.Rajaji hospital, attached to Madurai medical college, Madurai. Ethical committee approval and written consent were obtained

Inclusion criteria:

- ASA I-II,
- Age 20-60 yrs
- Weight 40-60 kgs,
- Undergoing minor surgical procedures under total intravenous anaesthesia.

Exclusion criteria:

- Patients with a known or predicted difficult airway
- At risk of aspiration or pulmonary aspiration of gastric contents
- Pathology of neck, upper respiratory or upper alimentary tracts

Group A- Patients in whom I-gel was used
Group B-Patients in whom LMA was used.

A standard anesthesia protocol was followed Patients were fasted for at least 6 h for solids and 4 h for liquids. Routine monitoring including pulseoximeter, noninvasive blood pressure monitor, Etco2 monitor were done.

Patients underwent intravenous induction with Propofol 2mg/kg, inj Fentanyl 2mcg/kg. Following induction, mask ventilation was performed until conditions suitable for device insertion [apnea and lack of response to jaw thrust, loss of eyelash reflex] were obtained .The sizes 3 and 4 were used in patients weighing 30-50kg and 50-70 kg respectively.Anaesthesia was maintained with N_2O: O_2 and Propofol according to patient response.

All techniques were performed in the sniffing position with the cuff fully deflated and using a midline or slight lateral approach. The posterior surface of the LMA was lubricated with a water soluble jelly. The tip of the index finger was placed on the point where the tube joins the mask. With the aperture facing forward the tip of the cuff was placed against the inner surface of the upper incisors or gums and inserted. Once the LMA was inserted into the pharynx the cuff fully was inflated with air until effective ventilation was established or the maximum recommended inflation volume (size 3-20 ml, size 4-30 ml) was reached .Fixation was according to the manufacturer's instructions.

In I-gel, front, back and sides of the cuff were lubricated with water based jelly. The device was grasped along the integral bite block and was introduced into the mouth in the direction towards the hard palate and was glided downwards and backwards along the hard palate until definite resistance was felt.

Three attempts of device insertion were allowed before insertion was considered a failure. Failed insertion was defined by any of the following criteria.

1. Oropharyngeal impaction (failed passage into the pharynx)

2. Glottic impaction (airway obstruction, mid portion of bite block protruding from the mouth)

3. Mechanical airway obstruction (airway obstruction, mid portion of

bite block between teeth, no improvement with Propofol,

4. Reflex airway obstruction [airway obstruction, mid portion of bite block between teeth, improvement with Propofol],

5. Folding over the cuff [clear airway, midportion of bite block protruding from the mouth, failure to insert the gastric tube] and

6. Inadequate seal [clear airway, mid portion of bite block between teeth, low airway pressure oropharyngeal air leak]. Oropharyngeal seal pressure was noted by closing the expiratory valve at a fixed gas flow of 5L per minute and recording the airway pressure at which the gas leaked into the mouth. At this point, gas leakage was heard at the mouth, at the epigastrium (epigastric auscultation) or coming out the drainage tube (I-gel group). Manometric stability test is one of the most reliable test.

The etiology of failed insertion was documented. If insertion failed after three attempts a single attempt was permitted with the alternative technique.

The information collected regarding all the selected cases were recorded in a Master Chart. Data analysis was done with the help of computer using Epidemiological Information Package (EPI 2002) developed by Centers for Disease Control and Prevention (CDC), Atlanta for W.H.O.

Using this software, frequencies, percentage, range, mean, standard deviation, x^2 and 'p' values were calculated. A 'p' value less than 0.05 is taken to denote significant relationship.

4. RESULTS AND DISCUSSION

TABLE – 1: AIRWAY SEAL PRESSURE

CM of H_2O	GROUP A		GROUP B	
	No	%	No	%
10-20	7	17.5	39	97.5
20-30	33	82.5	1	2.5
	<0.0001 significant			

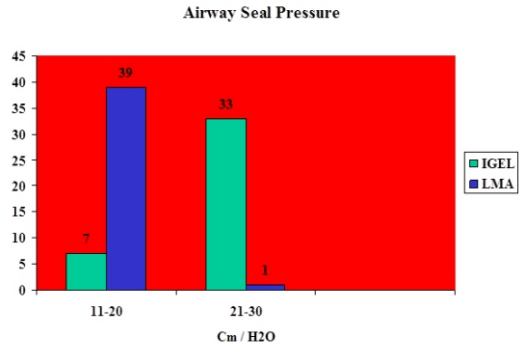

FIGURE 1: AIRWAY SEAL PRESSURE

In the I-gel group the airway seal pressure achieved was superior when compared to LMA These results were found to be statistically significant. 80 patients undergoing minor surgical procedures under total intravenous anaesthesia were taken up for the study. They were allocated into 2 groups of 40 each. In one group I-gel and in another group LMA was used as the supraglottic airway device.

OROPHARYNGEAL SEAL PRESSURE

Oropharyngeal seal pressure was higher in I-gel group when compared to LMA group .This denotes I-gel has a better sealing pressure and it fits well with the laryngeal anatomy .This is similar to study conducted by J.J.Catward, T.M.Cook, C.Seller, J.Handel, T.Simpson, V.Vanek and F.Kelly Department of anaesthesi ,Royal United Hospital, Combe Park, United Kingdom [6].

This study was conducted in the elective operation theatresof Govt.Rajaji hospital, attached to Madurai medical college. The aim of the study was to compare oropharyngeal airway pressure I-gel and LMA in patients undergoing minor surgical procedures under total intravenous anaesthesiaThe study included 80 patients who underwent minor gynaecological procedures, orthopaedic and surgical procedures The oropharyngeal seal pressure was higher in I-gel than LMA group.

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