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To Evaluate Haemodynamic Changes to Laryngascopy and Intubation and Proseallma Inseration.

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ABSTRACT

In this study, we evaluated hemodynamic changes to laryngoscopy and intubation and Proseal LMA Insertion in 50 patients in the age group between 18 to 74yrs, either sex, ASA grade 1 or 2, scheduled to undergo elective surgery under general anaesthesia. The study involves preoperative evaluation on the day of surgery, patients were anesthetized by using a balanced anaesthesia technique i.e., all the patients were premedicated with intravenous inj. Midazolam 0.03mg\kg. Inj. Glycopyrrolate 0.2 mg and inj. Nalbuphine 0.1Laryngoscopy is the technique used for the visualization of the larynx for intubation. Depending upon the necessity, the tube may be passed either through the mouth (orotracheal intubation) or through the nose (Nasotracheal intubation). Endotracheal intubation is the procedure of passing an endotracheal tube into the trachea and is also termed as "intubation". Endotracheal intubation is used to maintain an airway and provide positive pressure ventilation, and provide prevention for pulmonary aspiration and gastric inflation in unconscious patients. Laryngoscopy is used to view the larynx and adjacent structures and aid endotracheal intubation. The technique of laryngoscopy is depending upon the atlantooccipital joint which is aligned by the oropharyngeal and laryngeal axis. The endotracheal intubation although is the golden standard to achieve and protect the airway, has got its disadvantages. It includes a pressor responsewhich increases heart rate and blood pressure. This can be dangerous for patients with cardiorespiratory disorders.1 The proseal LMA is reported to be more difficult to insert than the Classic LMA, as its larger and softer cuff is prone to folding. It is recommended that the proseal LMA is inserted by using either manipulation with fingers or a curved metal introducer. Nonetheless, in the first attempt, the success rates of proseal LMA insertion 11 range from up to 81% to 87%, which is lower than the Classic LMA. Consequently, a variety of techniques have been developed to facilitate supplement of the proseal LMA, including the drain tube within a guiding instrument, such as a suction catheter, a gastric tube, a gum elastic Bougie, and a Flexi-Slip stylet2.

Keywords: LMA, endotracheal, intubation, Proseal LMA, surgical procedures

INTRODUCTION

The proseal LMA causes less pressure during insertion as compared to tracheal intubation and an increase in heart rate is a very short time living. Proseal LMA also results in minimal cough and produces a smooth emergence. Proseal LMA is used in pressure-controlled ventilation with positive end-expiratory pressure in pediatric patients. The objective of the study is to compare the effects in the insertion of proseal LMA and intubation on hemodynamic changes to evaluate the safety and efficacy of Proseal LMA as an airway device in pediatric patients.3The laryngeal mask airway (LMA) is a supraglottic airway management device. The LMA is preferred for airway management in pediatric patients for a short duration in surgical procedures. The recent introduction of Proseal (PLMA) is modified by Classic LMA, ithas a gastric drainage tube placed in lateral to maintain the airway tube and allows the regurgitated gastric contents to bypass the glottis and prevent the pulmonary aspiration4

Although there is evidence that the classic laryngeal mask airway (classic LMA) is a safe and effective airway device for gynecologicallaparoscopy. Most clinicians prefer to use a tracheal tube (TT) as they consider ventilation and airway protection to be mandatory anddo not consider that the classic LMA fulfills these requirements. PLMA is effective for gynaecological laparoscopy with some 12 advantages in terms of ease of insertion, hemodynamic responses, and airway protective reflex activity. In 1983, Sir Archie Brain formulated the very first supraglottic airway device, the LMA Classic(cLMA). This device was introduced clinically in 1988. LMA has various designs: The Proseal LMA The I-Gel Less invasive, helpful in difficult intubation patients, less physical damage to oropharyngeal structures, vocal cords need not be visualized, less laryngospasm and bronchospasm, does not require neck mobility, and no chances of esophageal or endobronchial intubation. The mask of the intubating LMA (ILMA) that is cuffed sits on top of the glottis and therefore there is no distortion of the extra glottis structures which ultimately results in less laryngeal stimulation causing the stress response to be les

Laryngoscopic incitement of oropharyngeal structures might be a significant factor in the hemodynamic pressure reaction and related to tracheal intubation. It has been recommended that distension of supraglottic tissues is the significant reason for sympathoadrenal reaction to Laryngoscopy. Along these lines, it might be possible that a method of visually impaired oral intubation created a huge decrease in stress reaction to intubation contrasted with

direct laryngoscopy (DL).6 In standard, tracheal intubation strategies that evade or limit oropharyngeal incitement may constrict the hemodynamic pressure reaction or decrease the rate of hemodynamic and endocrine pressure reactions of endotracheal intubation using an ILMA conversely of DL. This study aimed to lookat hemodynamic results (SBP, DBP, Guide, and HR at the gauge, preintubation, 1, 3, and 5 min after intubation) among DL and ILMA in the patients going through two technique for intubation with generalsedation.

ADVANTAGES OF LMA:

Less stimulation of the sympathetic system leading to lowerhemodynamic instability The patient even in the light plane of anaesthesia better tolerates it.Ease of insertion and smooth recovery. Avoidance of laryngoscopy and muscle relaxant. They do not displace bacterial colonies from oral or nasal to lowerrespiratory tract. In case of cannot ventilate, cannot intubate the situation, it is usedas a life- saving device in securing the airway. Less injury in the airway as compared to ETT. Pollution to the operating room is less compared to the face mask. Recovery and emergence time is less.

DISADVANTAGES AND CONTRAINDICATION OF LMA:

It does not protect against aspiration so contraindicated in full stomach patient. Not useful in patient with glottis and supraglottic obstruction, or pathology. It is not a definite airway. Patients with poor lung compliance cannot be recommended as it needs high inflation pressure. Patient with less mouth opening. Oral and cervical pathology like large goiter, tumor. 1

ANATOMY OF AIRWAY

Lungs, the complicated and delicate organ carrying out very precise body functions, are safely encased in and protected by the rib cage. Nevertheless, they are vulnerable where they have to come into contact with the outside world. The long passage leading to it that is the airway is charged with some important functions which are essentially protective. The anesthesiologist commonly has to interfere with this passage. The airway needs to be treated with rest, the more we understand it, the less the harm we do to the patients. The anaesthetistrequires particularly specialized knowledge of anatomy. Here, we will describe basic anatomy, particularly of the upper airway. The airway extends from the mouth or nose to terminal bronchioles. Anatomical structures relevant to endotracheal intubation include the mouth, oral cavity, pharynx, larynx, and trachea.

MOUTH:

The Mouth is made up of the vestibule and the mouth cavity, the former communicating with the latter through the angle of the mouth. The vestibule is formed by the lips and cheeks on the out and by the gums and teeth within. The cavity of the mouth is bounded by the alveolar arch and teeth in front, the hard and soft palate above, anterior two-thirds of the tongue, and the reflection of its mucosa forward on to the mandible below and the or pharyngeal isthmus behind. 18

The tongue is a muscular organ situated in the floor of the mouth, which can be moved in any direction. Its bulk prevents the direct vision of the larynx. Each half contains four intrinsic and four extrinsic muscles.

Intrinsic muscles: occupy the upper part of the tongue. They alter the shape of the tongue (superior, inferior, transverse, and vertical muscles) • Palatoglossus passes in the palatopharyngeal fold to the tongue and narrows the or pharyngeal opening. Palatopharyngeus lies in the palatopharyngeal fold (posterior pillar) and joins with the pharyngeal constrictor muscle. It narrows the oropharyngeal opening. Musculus uvulae is an intrinsic muscle that draws up the uvula.

Methodology:

Written informed consent was taken from all patients. Patients once shifted to OR, saturation probe, non-invasive BP cuff, 3 lead ECG & temperature probe was placed in all patients. Patients received general anesthesia as per standardized protocol and were premedicated with injection midazolam 0.05 mg/kg, injection Glycopyrrolate 0.01mg/kg injection nalbuphine 0.1mg/kg, and preoxygenation for 3 min. The patient was induced with injection propofol 2mg/kg till there is a loss of response to the command. Patient mask ventilated with 100% oxygen, injection succinylcholine 1.5mg/kg given and intubated with appropriate size ETT in group A and appropriate size LMA in group B. The depth of anesthesia was maintained by oxygen, nitrous oxide, and isoflurane adequate muscle relaxation is achieved with injection of vecuronium 0.1mg/kg. 51 Hemodynamic responses heart rate, SBP, DBP, MAP, spo2, Etco2 was recorded at the beginning of intubation, at 2 mints, 4 mints, 6mints, 10 minutes after intubation. Each group was statistically assessed to draw arelevant conclusion.

REVIEW OF LITERATURE

Montazeri K et al. [2004] compared the hemodynamic changes after LMA, facemask, and ET intubation. 195 healthy patients with normal blood pressure (BP) and normal airways were randomly grouped according to their airway management (65 patients in each group) during the transurethral lithotripsy procedure. Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP) and mean arterial blood pressure (MAP) readings were noted

before the induction, and then at every 3 mints interval till 30 mints. They figured out that stimulation of the trachea directly seems to be one of the main causes of such hemodynamic changes. But the fact that hemodynamic changes with LMA were fewer than facemask needs to be further evaluated. 8

Sharma, B. et. al [2008] Used PLMA for the airway management of one thousand consecutive anaesthetised paralyzed patients, aged 13 - 86 years belonging to ASA physical status 1 to 3 scheduled for elective laparoscopic and extraperitoneal endoscopic surgeries. Details of insertion, oropharyngeal seal pressure, and ventilator performance and safety data of the PLMA were recorded during surgery, oxygenation, andventilation. Variables were adjusted to maintain saturation > 95% as measured by pulse oximetry and ETCO2 < 46 mmHg respectively. The success rate of PLMA insertion and gastric tube placement was 100%. One patient had short-lived SPO2 of 94% while three patients showed a transient increase in ETCO2 >55 mmHg. 25(2.5%) patients showed gastric regurgitation, suctioned through the oesophageal channel of the PLMA, but no case of pulmonary aspiration was detected, median OSP was 36cm H2O. The median peak inspiratory pressure (PIP) before and 43 after CO2 was 10 and 18 cm H2O, respectively ($p < 0.001$). They concluded that the PLMA, in experienced hands is an efficient and safe airway tool for the airway management of patients undergoing elective laparoscopic surgery. 9

Ashleigh, SH et. al [2011] studied the Hemodynamic response to tracheal intubation via laryngoscopy and ILMA having 40 patients in each set, undergoing coronary artery bypass graft (CABG). BP and HR were noted before and after induction of anaesthesia (one minute beforeand one, two, and five minutes after accomplishing intubation via both methods respectively). In both sets, there was a rise in HR and BP. They figured that it was difficult to ascertain if intubation via ILMA is a better way of intubation in cardiac patients or not. It appears that ILMA may not possess a greater benefit over traditional DL in patients of CABG.10

Jarineshin, H. et. al [2015] studied the immediate hemodynamic consequences of the insertion of LMA supreme (LMA-S) and classic (LMA-C) and laryngoscopy and endotracheal intubation on 150 patientsbetween 18 to 50 years with ASA I physical status grading. In the ETT group, intubation was done using the Macintosh blade and for the LMA- C and LMA-S sets, LMA Classic and LMA Supreme were used, respectively. They deduced that maintenance of the airway using LMA isrelated to less cardiovascular responses as compared to DL and tracheal intubation. 11

Kiran, I. et. al [2015] compared the hemodynamic change after tracheal intubation with that of LMA insertion in patients with hypertension. 60 such patients of 40-60 age group of either gender of ASA grade II physical status were randomly divided into two sets of 30 each (group

Results and observations

This study was conducted on a total number of 50 patients, the aim is toevaluate hemodynamic changes to laryngoscopy and intubation & proseal LMA insertion, which are divided into two groups. They consist of 25 participants each, were comparable in terms of age, sex, ASA, weight, and baseline hemodynamic parameters. This study demonstrated that hemodynamic response consisting of heart rate, SBP,DBP, and MAP that comes with laryngoscopy with ETT insertion is significantly greater than that caused by LMA insertion. It is also observed that the insertion of an LMA is easier and takes a shorter time as compared to laryngoscopy with ETT insertion.

The LMA group in this study also showed a significant increase in HR, SBP, DBP as well as MAP after insertion of the LMA. These results are similar to those of a study done to investigate the cardiovascular effects related to the insertion of laryngeal mask airway as compared ETT, following insertion of a Guedel oral airway, a significant increase in arterial pressure and heart rate is followed by insertion of a laryngeal mask and the Guedel airway with a slight difference between the two groups at any time. As both the devices did not go through the trachea, 89

The HR, SBP, DBP, and MAP significantly increased from the baseline value at intubation that persisted till 5 minutes in the ETT group [$p< 0.05$].similarly, the rise in HR, SBP, DBP, and MAP were observed at extubation, [$p< 0.05$]. however, the hemodynamic parameters remained comparable to the baseline values [$p> 0.05$] after insertion of proseal and as its removal. Saraswat et al reported a significant increase in heart rate and the means arterial pressure 10 seconds after intubation that lasted till 3 minutes after intubation and also during the time of extubation in the ETT group. 26

Sharma Bet al reported that there were no significant hemodynamic changes at 1 and 5 min after insertion of PLMA,[$p< 0.05$].9 similarly Kannan S et al concluded in their study that SBP, DBP, and MAP were lower in group PLMA at 1 and 2 min after insertion and its removal, [$p<0.01$]18. Piper et al also reported higher mean arterial blood pressures

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