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Original Research Paper

Anesthesiology

COMPARISON OF THE PERFORMANCE OF CLASSIC LMA VS AMBU LMA IN MINOR GYNECOLOGICAL SURGERIES

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ABSTRACT

Background : Supraglottic airway devices are quicker airway control devices even in inexperienced personel. It has better hemodynamic control, less complications and better avoids the disadvantages of the ET insertion.

In our study, We compare the performance of CLASSIC LMA and AMBU LMA in minor gynecological procedures.

Materials & Methods : In a Prospective randomised case control study, 30 patients in each group were enrolled. size 3 or 4 LMA was used in all adult patients under General anaesthesia without muscle relaxant.

Results : AMBU LMA has 90% ease of insertion, 93.3% in first attempt, less time taken for insertion (15 seconds), better hemodynamic control in 5 minutes compared to CLASSIC LMA (63%,83.3%,24seconds respectively). Complications like sore throat, blood stain in throat is comparable in both LMA.

Conclusion : AMBU LMA has superior performance compared to CLASSIC LMA, and has no significance in view of complications like sore throat.

KEYWORDS : CLASSIC LMA, AMBU LMA, Supraglottic airway device, sore throat

INTRODUCTION :

Supraglottic airway devices are devices that ventilate patients by delivering anaesthetic gases and oxygen above the level of vocal cords thereby avoiding the disadvantages of endotracheal intubation. Supraglottic airway devices have the advantages of avoiding laryngoscopy, better tolerance by the patients, lesser hemodynamic perturbations, lesser invasiveness of the respiratory tract, easier placement of the device, airway free from manipulation, lesser complications like sore throat and easier, quicker control of airway even by inexperienced personal.

LMA CLASSIC is a first supraglottic airway device, made up of silicone and is reusable. Whereas AMBU LMA is a disposable device, made up of PVC and has 90 degree bent thereby confronting the shape of hypopharynx.

AIM:

Aim of the study is to compare the effectiveness of Classic Laryngeal Mask Airway with AMBU Laryngeal Mask Airway in respect to the following parameters

1. Ease of insertion of airway device
2. Number of attempts for insertion of airway device
3. Time taken for insertion of airway device
4. Hemodynamic response to Insertion
5. Blood staining of devices
6. Incidence of complications

MATERIALS AND METHODS :

It was a prospective, randomized, single-blinded, case-controlled study conducted in Department of Anesthesiology, TRICHY SRM Medical College Hospital & Research centre,Trichy. 60 adult patients satisfying the inclusion criteria were enrolled in the study.

INCLUSION CRITERIA:

1) Age: 18 yrs and above
2) Weight : BMI < 30kg/m^2
3) ASA : I & II
4) Elective Surgery
5) Mallampatti scores : I & II,
6) Patients given valid informed consent

EXCLUSION CRITERIA:

1) Not satisfying inclusion criteria
2) Patients posted for emergency surgery
3) Patients with difficult airway
4) Lack of written informed consent
5) Pregnant female
6) History suggestive of Gastro oesophageal reflux disease/ Hiatal hernia
7) Poor lung compliance such as pulmonary fibrosis

MATERIALS:

1) LMA Classic 3 & 4
2) LMA AMBU 3 & 4
3) 20 ml syringe
4) Lubricant jelly
5) Drugs: glycopyrolate, fentanyl, propofol, sevoflurane, ondansetron
6) Moitors : ECG, Pulse oximetry, Capnography, NIBP

STUDY OUTCOME:

1) **Ease of Insertion of airway device:** The ease with patient were intubated was judged subjectively on nominal scale as "easy (1)" and "difficult (2)"
2) **No of Insertion attempts:** The no. of attempts required for successful insertion was recorded. A "failed attempt" was defined as removal of the device after third attempt and requiring other methods to secure the airway.
3) **Time taken for insertion:** It is defined as the time elapsed between picking up of airway device in the hand until the presence of square wave capnography trace.
4. **Haemodynamic response:** The Heart rate and blood pressure of the patients were recorded before insertion, 1 min after insertion, 2 min after and 5 min post insertion of the device.
5. **End tidal carbondioxide:** The EtCO2 was measured after device insertion
6. **Blood staining of the device:** The presence or absence of blood on the device was noted at the end of surgery following removal of the device after adequate recovery.
7. **Incidence of complications:** After removal of the device following adequate recovery patients were asked whether they experienced sore throat. Sore throat was defined as a

constant pain or discomfort in the throat independent of swallowing.

CONDUCTION OF THE STUDY :

After obtaining ethical committee clearance, 60 patients satisfying the inclusion criteria were enrolled in the study. A written informed consent obtained and randomly allocated onto 2 groups, LMA –C and LMA-A, with thirty each by using closed envelop method. The size of the airway was chosen according to manufacturers recommendations. All patients were induced with routine General Anaesthesia i.e premedication with glycopyrrolate 0.2mg, Fentanyl 2mcg/kg,induced with inj.Propofol 2mg/kg. intubated with appropriate size LMA by one finger technique and inflated with air to provide a seal which can permit ventilation without leaks. Position of the LMA was confirmed by EtCO2 tracings, square wave form of EtCO2 was taken as indicator of effective ventilation. Else , another attempt was tried with the maximum of 3 attempts. The ease of insertion, no of attempts taken for successful placement and time taken for insertion were recorded in both groups. In both groups anaesthesia was maintained with N2O:O2 at 1:1ratio with 2% sevoflurane without any muscle relaxants. The Heart rate and Blood pressure were recorded 1 min after insertion, after 2 minutes and 5 minutes post insertion. At the end of the surgery, after thorough oral suctioning, the airway device was removed upon return of spontaneous breathing and eye opening of the patient. After removing the airway, it was inspected for any blood on the device which is an indication of airway trauma. 50 The following complications were recorded – cough, stridor, laryngospasm and hypoxia. Patients were evaluated for the presence of sore throat before leaving the operating room and 2 hrs post operatively in the recovery room. All recorded data were analysed with SPSS software for V Windows version 15.0. The quantitative datas were analysed by students t-test and the qualitative data by chi-square test. Power analysis was calculated using Minitab for windows and the power was well above the accepted level of 80%.

OBSERVATION AND RESULTS :

Results are expressed as mean and standard deviation. All statistical analyses were carried out using SPSS for windows version 15.0. The t-test was used for comparison of quantitative variants. Qualitative variants were compared using the chi-squared test. A, 'p' value of less than 0.05 was considered statistically significant.

Age, height,weight, BMI,ASA PS status,MPC grade wise in both groups there was nothing significant.

27 patients are intubated easily with AMBU LMA against 19 patients in LMA CLASSIC with P value of 0.0126 which is significant.

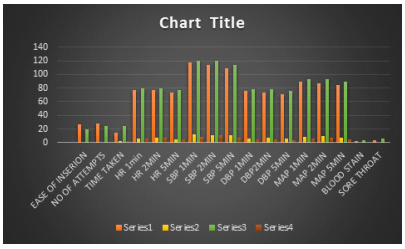
28 patients versus 25 patients are intubatedin first attempts with AMBU LMA , LMA CLASSIC respectively (P value – 0.0281 significant).

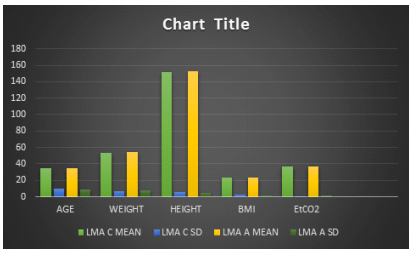
Time taken for intubation is less with AMBU LMA (15.2 SEC ±2.7 SEC) compared to CLASSIC LMA (24.77±2.54 SEC).

Blood staining of the device and sore throart are not significant and comparable in both devices.

parameters	LMA C	LMA C	LMA A	LMA A
	MEAN	SD	MEAN	SD
AGE	34.6	9.4	35.2	8.4
WEIGHT	53.63	7.11	54.16	7.47
HEIGHT	152	5.41	153.1	4.97
BMI	23.3	2.594	23.03	2.077
EtCO2	36.97	0.85	37.03	1.52

INCIDENCE	LMA A	LMA A2	LMA C	LMA C2
	MEAN	SD	MEAN	SD
EASE OF INSERION	27		19	
NO OF ATTEMPTS	28		25	
TIME TAKEN	15.2	2.7	24.77	2.54
HR 1min	77	6.2	79.2	6.6
HR 2MIN	76.8	7.6	79.8	7.4
HR 5MIN	73.4	4.8	76.6	4.9
SBP 1MIN	118.03	11.7	120.1	8.27
SBP 2MIN	114.17	11.04	119.93	10.62
SBP 5MIN	109.47	11.32	114.5	7.03
DBP 1MIN	75.8	6.1	78.53	4.4
DBP2MIN	73.67	7.4	78.4	5.32
DBP 5MIN	71.37	6.2	76	3.67
MAP 1MIN	89.5	8.1	93	6.3
MAP 2MIN	87.16	9.5	93.02	7.37
MAP 5MIN	83.94	7.58	88.83	4.72
BLOOD STAIN	2		3	
SORE THROAT	3		6	





DISCUSSION :

AMBU LMA is a type of supraglottic airway device which is a disposable device, better conforming to the human anatomical airway. This study is to compare the clinical performance of LMA Classic with the AMBU LMA.

Ease of insertion of airway device: Insertion of AMBU LMA was easy in vast majority of population. In our study AMBU LMA is inserted with ease in 90% of patients and Classic LMA was inserted with ease in 63 % of patients. This is in concurrence with the study conducted by Sudhir et al. They compared AMBU LMA with Classic LMA as a cross over study and found that AMBU LMA had better ease of insertion compared to Classic LMA. Hagberg et al[2] conducted a multicenter study and found that AMBU LMA was easier and quicker to insert. Kristine et al4 found that AMBU LMA scored 100 % and Classic LMA scored only 93 % in term of ease of insertion.

Number of attempts to successful placement:
AMBU LMA was successfully inserted in 100 % patients with the first attempt success rate of 93.3 %. Classic LMA was successfully inserted in 100 % with first attempt success rate of 83.3 %. The first attempt success rate was superior for AMBU LMA compared to the Classic LMA. The study conducted by Suzanna et al[1] reported 87 % and 83 % first attempt success rate for Classic LMA and AMBU LMA respectively. The study conducted by Genzwuerker et al8 reported 90 % and 94 % first attempt success rate with Classic LMA and AMBU LMA respectively. The overall success rate in many previous studies is 100 %, and is achieved in 2 attempts.

Time taken for insertion of the airway device:

Securing an effective airway was rapid with AMBU LMA compared with Classic LMA. The time taken for securing the airway with AMBU LMA was 15.2 sec which was shorter than 24.77 sec taken for the Classic LMA group. 70 This was supported by Suzanna A.B et al1 . The mean insertion time was found to be 40 sec for the Classic LMA group and 35 sec for the AMBU LMA group (p = 0.008). Studies by Miceli.L3 et al and other studies conclude that AMBU LMA took shorter time for insertion compared to Classic LMA. The shorter insertion time can be extremely beneficial in difficult airway or in emergency situations.

Haemodynamic responses:

Heart rate, SBP, DBP and MAP after insertion were maintained better with AMBU LMA than the Classic LMA. This is supported by the study conducted by SY Ng et al32 .The study concludes stating that haemodynamic instability following insertion of either of the airway devices were similar. Many other studies came to the conclusion that haemodynamic responses were similar among AMBU LMA and Classic LMA.

Complications:

Blood staining:

Incidence of blood staining found on the device due to airway trauma is comparable among both the devices. Suzanna et al[1] evaluated the efficacy and found that blood staining was found in 22 % and 14 % in Classic LMA and AMBU LMA respectively which were comparable.

Sore Throat:

Incidence of sore throat were comparable among Classic LMA and AMBU LMA. Kristine Faust et al4 reported the incidence of sore throat of 10 % in AMBU LMA group and 13 % in Classic LMA group which were comparable.

CONCLUSION:

AMBU LMA has the advantage of being a single use device. There is an increased tendency towards single use devices due to awareness that protein and bacteria persist on anaesthetic and surgical instruments following decontamin ation and sterilization. Being a single use device it can reduce or even eliminate this problem.

Our study has certain limitations. First, we studied a female population with normal airways undergoing elective minor gynaecological surgeries. The data collected cannot be extrapolated to the use of LMA classic and LMA AMBU in males. Second, blinding was not practically possible, which may be a possible source of bias. Finally, being a single use device the cost effectiveness was not addressed.

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