ORIGINAL RESEARCH PAPER

Anaesthesiology

AIRWAY MANAGEMENT IN LATERAL POSITION. COMPARISION BETWEEN CLASSIC LARYNGEAL MASK AIRWAY AND I GEL

KEY WORDS: Classical laryngeal mask airway, I-gel, supraglottic airway devices, left and right lateral position.

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ABSTRACT

INTRODUCTION – General anaesthesia anaesthesia is usually induced in supine position. But in some situations we may have to induce general anaesthesia in lateral position. Also in situations where the surgery has started in regional, patient turned to lateral position for surgery, during the course of the procedure the effect of regional anaesthesia may wear off and patient may complain of pain. In the middle of surgery we may not be able to turn patient supine to induce general anaesthesia and for securing airway. In these situations where patients airway has to be secured in lateral position supraglottic airway devices plays a pivotal role as it is inserted blindly into hypopharynx without use of any airway instrumentation. The aim of this study is to compare two different supraglottic airway devices i.e classic LMA and I gel regarding ease of insertion and efficacy of ventilation in lateral position.

METHODOLOGY – A prospective randomized study was conducted in eighty patients who were posted for various surgical procedures under general ANAESTHESIA were chosen. They were randomly divided into four groups of 20 patients (right lateral position with I gel, right lateral position with classic LMA, left lateral position with I gel, left lateral position with classic LMA). All the patients were induced in their allotted lateral position by randomization and planned supraglottic airway was inserted in that position. Ease of supraglottic device insertion and adverse effects were assessed in all .

RESULTS – there was statistical significant difference between supraglottic airway device insertion in right and left lateral positions. (IRL 42+/-10sec, ILL 60 +/-9sec, CRL 48+/-10sec , CLL 66 +/- 8 sec) (p= 0.0020). number of attempts taken for I gel in right lateral position were less than other groups (90% success rate). Trauma was found to be more in I gel group in left lateral position.

CONCLUSION – Insertion of I-gel was significantly easier and more rapid than insertion of CLASSIC LMA. It was easier to insert supraglottic airway device in right lateral position than left lateral position and insertion of I gel was easier compared to classic LMA. Supraglottic device was successfully inserted in all the patients. None of our patients had desaturation. But amount of trauma caused by I gel was more than classic LMA.

INTRODUCTION

Securing patient airway is primary responsibility of the anesthetist. failure to establish or maintain a patent airway can causes asphyxia and death. endotracheal intubation is conventionally performed when the patient is in the supine position, it may be sometimes required to secure the airway in the lateral position (1,2).some upper limb and lower limb surgical procedures are done in lateral position under regional anaesthesia. During the course of surgery action of local anaesthetic can wear off and patient can complain of pain. Then anaesthetist has to induce general anaesthesia in this patient. Administration of general anaethesia without securing airway is hazardous Iit may not be possible to turn the patient supine for induction of anaesthesia and securing the airway. It may be difficult to intubate the patient in lateral position (Although the acquisition of skill and experience of intubation in the lateral position has been advocated (3), its effect on airway anatomy and management of the airway have not been determined in humans.)

Laryngeal mask airway which is a supraglottic airway device introduced by Brains in 1981 was initially used in failed intubation. This does not require the use of laryngoscope so it can be used in lateral position also.

I gel which is a non inflatable supraglottic airway device with a gastric channel is gaining popularity in anaesthesia practice and for resuscitation because of its ease of insertion and stable positioning.(13) Because of this advantages I gel is better suited for lateral position.

Aim of our study is to compare the ease of insertion and adverse effects using the insertion of classic LMA ad I gel in lateral position and to note if there are any adverse effects between both.

METHODOLOGY:

After getting ethical committee clearance this study was started. 80 consenting patients of either gender aged between 18 and 65 years who belonged to ASA physical status I and II, who were posted for elective surgical procedures under general anaesthesia under supraglottic airway devices were recruited for study. They were randomly divided into four groups of 20 patients each by closed envelop method.

FIRST GROUP IS GROUP IRL :
Patients in whom I gel was used in right lateral position

SECOND GROUP IS GROUP ILL :
Patients in whom I gel was used in left lateral position

THIRD GROUP IS GROUP CRL :
Patients in whom classic laryngeal mask airway was used in right lateral position

FOURTH GROUP IS GROUP CLL :
Patients in whom classic laryngeal mask airway was used in left lateral position

Exclusion Criteria included Mallampatti class 3 and above, Anticipated Difficult airway, Thyromentl distance less than 6.5cm, Mouth opening less than 3cm.

A thorough pre anesthetic evaluation was done on the previous evening of surgery, Informed consent was taken. Premedication was given as per department protocol.

Patients were shifted inside the Operation Room at scheduled time. The patients were then turned into the lateral position depending on the groups to which they were allocated. In the lateral position, the head was positioned on pillows so that the sagittal axis of the head and neck was parallel to the tabletop and placed in a sniffing position. Monitors connected were ECG, NIBP and SpO2 . Basal parameters were noted and recorded. IV cannula was secured and IV fluid started.

In all the patients Preoxygenation was done with 100% O2. After 3 minutes of preoxygentation, Inj. Propofol 2.5 mg/kg body weight and fentanyl 2mics/kg body weight was given. ventilation with 100% O2 with 1% isoflurane was continued. After 60seconds, designated supraglottic airway device insertion was tried as per the standard technique. Ease of insertion and adverse effects were noted.

Ease of LMA insertion was decided depending on time taken for LMA insertion and depending on number of attempts taken for insertion of LMA. Successful ventilation through LMA was noted using bilateral chest expansion, ETCO2 graph, absence of audible leak at less than 20 cm of water inflation pressure and absence of gastric distension

If the LMA insertion was unsuccessful, Propofol was given 0.5 mg/kg body weight, 100% O2 administered with Isoflurane 1% and after 30seconds , LMA insertion was attempted. If again unsuccessful Inj.Propofol 0.5 mg/kg body weight given IV, O2 administered and LMA insertion was tried again after 30 seconds of Propofol injection. If again unsuccessful patients were turned supine and were excluded from the study.

Side effects like coughing, movements of head and limbs, desaturation were noted. The device was removed after the patient regained consciousness spontaneously and responded to verbal command to open the mouth. After the removal of LMA, LMA is inspected for blood stain to assess trauma during insertion if any.

RESULTS

Group sample sizes of 40 and 40 achieve 81% power to detect a difference of -10.6 between the null hypothesis that both group means are 15.6 and the alternative hypothesis that the mean of group 2 is 26.2 with estimated group standard deviations of 4.9 and 17.7 and with a significance level (alpha) of 0.05

Data for 80 patients were analyzed. The data collected are tabulated accordingly. The data collected are presented as mean, SD for quantitative observations and numbers/ proportions (%) for qualitative observations. For categorized parameters chi-square test was used, one way ANOVA test using SPSS software

TABLE 1 DEMOGRAPHIC DATA

charecterstics	IRL	ILL	CRL	CLL
Age (yrs)	38.29 +/- 12.4	40.22 +/- 11.4	41.52+/- 13.4	43.56 +/- 12.2
Gender				
Male	11	13	13	12
Female	9	7	7	8

Analysis of the demographic data in our study btw the study population showed that there was no statistical significant difference when comparing sex , mean age between the groups (p>0.05).

TABLE 2. MEAN DURATION OF TIME REQUIRED FOR INSERTION OF CLASSIC LMA AND I GEL

Group	Mean duration of time req for insertion (seconds)
IRL	42 +/- 10
ILL	60 +/-9
CRL	48 +/-10
CLL	66 +/- 8

Mean duration of time required for LMA insertion in right lateral to left lateral position in both groups were statistically significant with lesser time required for LMA insertion in right lateral position in both groups. (p = 0.0020)

version 20 is used to compare variables of all 4 groups.

TABLE 3. . NUMBER ATTEMPTS TAKEN FOR CLASSIC LMA AND I GEL INSERTION

Group	1st attempt	2nd attempt	3rd attempt	Failed LMA insertion
IRL	18	2	0	0
ILL	15	5	0	0
CRL	17	3	0	0
CLL	13	7	0	0

78% of our patients had LMA being placed in position in 1st attempt successfully. 22% of patients had 2nd attempt of LMA insertion. None of them in any group had 3rd attempt. No failed LMA insertion was noted in any group.

Group IRL had success rate of 90% in 1st attempt i.e 18 out of 20 patients had successful 1st attempt LMA placement. Two patients(10%) in this group had 2nd attempt of LMA insertion.

Group ILL had 1st attempt success rate of 75% with 15 patients out of 20 patients. 5 patients(25%) needed 2nd attempt for LMA placement

Group CRL had success rate of 85% at 1st attempt (n = 17). 3 patients (15%) had LMA insertion in 2nd attempt.

Group CLL had 1st attempt success rate of 65% only (n =13). 35% of patients in this group needed 2nd attempt for successful LMA insertion (n= 7).

TABLE 4. ADVERSE EFFECTS

Groups	PATIENT MOVEMENT	COUGHING	TRAUMA	DESATURATION
IRL	1	0	0	0
ILL	2	1	2	0
CRL	1	1	0	0
CLL	3	2	0	0

Out of 80 patients 8 patients had movements during LMA insertion with CLL group having highest number of patients (n = 3),

Coughing was noted in 4 out of 80 patients with CLL group having 2 patients and ILL and CRL group each had 1 patient. No coughing was noted in IRL group. (P >0.05 NS)

Trauma was noted to be high in I gel group with two patients having trauma of which both belonging to ILL group (p = 0.46 statistical insignificant)

None of our patients had desaturation during LMA insertion.

DISSCUSION

The most important element in providing functional respiration is the airway[4]. Anaesthesiologist are trained to secure airway in supine position and may not be familiar in securing airway in lateral position. Management of airway in supine/ lateral position has seen various developments since

introduction of various supraglottic airway devices[11]. Laryngoscopy in lateral position is difficult as visualization of vocal cords and epiglotis is difficult.the LMA was introduced by A I J brain as a radically new solution to the airway management[11]. LMA insertion does not requires laryngoscopy as it is blindy inserted into the hypopharynx. LMA has high success rate in hand of inexperienced user also[12]. And LMA insertion has minimal cardiovascular changes.

I gel – it has few special features compared to classic LMA like its tensile property which makes its placement more stable and a separate gastric channel for Ryles tube insertion. I gel has no cuff to inflate so making it easier to use. It provides the anatomical seal of the pharyngeal, laryngeal and perilaryngeal structures while avoiding compression trauma and the airway seal improves as the device warms to body temperature. The stem is elliptical in cross-section to minimize axial rotation and provide greater stability. It contains both airway and drainage tubes, and an integral bite block.[16]

Our study had a success rate of 90% but In a study conducted by Richex et al insertion success rate was 97% which is higher than our study. In a study conducted by McCaul, the left lateral position resulted in a deterioration of laryngoscopic view in 35% of patients and improvement in none. In the lateral position, failure of airway management occurred in more patients with the endotracheal tube versus LMA (8 of 39 versus 1 of 30; P = 0.03)

In our study group IRL and group CRL had good ease of insertion with 90% and 85% success rate respectively in 1st attempt compared with more patients requiring 2nd attempt 25% and 35% in group ILL and CLL respectively. this may be due to difficulty in inserting airway devices in left lateral position irrespective of type of device used.(10). In the study conducted by Anitha et al out of thirty six patients, Thirty four patients could be intubated in the first attempt in the left lateral position (Group LL) whereas two required a second attempt. In the right lateral position (Group RL), only thirty patients could be intubated in the first attempt and five needed a second attempt.

Coughing was seen in 4 out of 80 patients which is less compared to study conducted by

Amr M Helmy which had 8 patients who experienced cough. In our study classic LMA induced coughing in 3 patients, but only 1 patient of I gel group had cough which is in accordance with study conducted by Amr M Helmy which also showed high cough rate in patients in classic LMA group. Also in study conducted by LIAN kah ti et al patients had higher cough rate with LMA use as LMA placement is associated with deglutination and requires suppression of hypopharyngeal sensations which might not have been sufficient enough to suppress cough reflex.

In our study out of 80 patients, 7 patients had head and limb movements which is in accordance with study conducted by where they had approximately 40% patients out of 88 patients with head and limb movements.(14)

Our study shows that trauma is more in I gel group than in classic LMA group but A study conducted by acott had no trauma in igel group. Our study is in accordance with study conducted by Amr M Helmy who also had two trauma in I gel patients. This may be due to hardness of I gel compared to classic LMA.

CONCLUSION

Supraglottic airway devices can be successfully used for securing airway in lateral position. Both classic LMA and I gel can be used to secure the airway. I gel is a supraglottic airway device with its own advantages which can be successfully used in patients who need lateral position for their surgery. It can be positioned safely even by a less experienced person and with less trauma and less chances of accidental extubation.

The airway characteristics may change from that in supine position compared to the patient is in lateral position. In our study we have also studied ease of supraglotic device insertion in left and right lateral positions. Anaesthesiologists have been trained to secure airway and also to perform laryngoscopy from right side.[10] in our study also more number of attempts was required to secure airway using supraglotic airway devices with the patient in left lateral position and also time required for successful placement of airway device is more in left lateral position.Of all the airway devices I gel takes comparatively less time for insertion, produces minimal patient response compared to classic LMA and needs less expertise for insertion but I gel produced more trauma compared to classic LMA in our study. Hence we conclude that I gel can be used to secure airway successfully in lateral position compared to classic LMA.

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