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COMPARATIVE STUDY OF I-GEL WITH LMA FOR MINOR SURGICAL PROCEDURES UNDER TIVA

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ABSTRACT 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. **AIM:** compare I-gel and LMA in patients undergoing minor surgical procedures under total intravenous anesthesia. The time of insertion, Number of attempts, oxygen saturation, airway manipulation if needed, and assess the side effects if any were observed between Group A Patients in whom I-gel was used Group B-Patients in whom LMA was used. **RESULTS:** the number of attempts required for insertion is equal for both LMA and I-gel groups. The insertion time is shorter in I-gel group when compared to LMA group The incidence of trauma and post-operative airway morbidity are similar in both I-gel and LMA group. **CONCLUSION:** the insertion time of I-gel is shorter in comparison with LMA The success rate of insertion, incidence of trauma and postoperative airway morbidity oxygen saturation are similar in both I-gel and LMA group.

KEYWORDS : Laryngeal mask airway, I-gel, oxygen saturation, airway manipulation

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. 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.[2] Today the ubiquitous use of LMA and similar supraglottic devices provides new possibilities in the approach to the airway.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.[3] The present study was carefully designed with utmost care to compare I-gel and LMA in patients undergoing minor surgical procedures under total intravenous anaesthesia.

2. AIM

The aim of study was to compare the insertion of LMA and I-gel in patients undergoing minor surgical procedures under total intravenous anaesthesia.To compare

- The time of insertion,
- Number of attempts,
- Oxygen saturation,
- Airway manipulation if needed, and
- To assess the side effects if any.

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 30-50kgand 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].

The etiology of failed insertion was documented. If insertion failed after three attempts a single attempt was permitted with the alternative technique. Any episodes of hypoxia [spo2 <90%] or other adverse events were documented.Any visible blood staining on the device was noted at removal. The mouth, lips and tongue were inspected for evidence of trauma. Patients underwent a structured interview 8-24 hrs after surgery. Patients were asked about sore throat [constant pain/independent of swallowing], dysphonia [difficulty/pain during speaking] and dysphagia [difficulty/pain on swallowing] are recorded. All the results were tabulated and analyzed.

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, x2 and 'p' values were calculated. A 'p' value less than 0.05 is taken to denote significant relationship.

4.RESULTS AND DISCUSSION

TABLE –1 : LMA/ IGEL SIZE

Size	GROUP A		GROUP B	
	No	%	No	%
	20	50	23	57.5
4	20	50	17	42.5
P	0.5073 Not significant			

The LMA sizes used were 57.5% in Size 3 and in 42.5% cases size 4 was used. In group I-gel size 3 was used in 50 % patients and size 4 used in50 % of patients .These differences were found to be statistically not significant Regarding the number of attempts for successful insertion in group A there was 97.5%success rate in first attempt and in group B there was 95 % success rate of insertion in first attempt. This showed that there is no statistically significant difference between the groups. Regarding the time for insertion group A the time was 16 s. In group B the insertion time was24 s. The difference in insertion time of 8s was found to be statistically significant. Airway manipulation was needed in 3 cases in I-gel group and in 2 cases in LMA group. These results were found to be statistically insignificant

TABLE – 2: TIME FOR INSERTION

Time for insertion	GROUP A	GROUP B
Range	14-21	20-30
Mean	16.3	24.53
SD	1.713	2.309
P	<0.0001 Significant	

In I-gel group the incidence of airway morbidity was about 5%.In group LMA the incidence of airway morbidity was about 5%. These results were found to be statistically insignificant with a 'p' value of 1. Success rate of insertion was 90 % and failure rate was 10%.

INSERTION TIME

The time for insertion was 16 seconds with Igel compared with 24 seconds with LMA. The additional 8 seconds is clinically and statistically significant. As no cuff inflation is needed in this device time required for insertion is shorter. In our study the insertion time was prolonged in LMA group and is consistent with the previous study done by Ashish Kannaujia Department of Anesthesia and critical Care, S.N.Medical College Agra[4] and Amr M Helmy, Hossam M Atef, Ezzat M El Taher,Ahmed Mossad Henidak Department of Anaesthesia and Intensive Care, Ismailia, Egypt.[5]

AIRWAY MANIPULATION

Airway manipulation in the form of increasing the depth of insertion was done in one case and in two cases the device was changed to larger size to achieve better seal in I-gel group. In LMA group in one case the depth of insertion was increased and in another case jaw thrust was done to assist easy insertion. This is comparable to the study done by Ashish Kannaujia Department of Anesthesia and critical Care, S.N.Medical College Agra[4].

GASTRIC TUBE PLACEMENT

A well lubricated 60 cm long gastric tube [10 F for size 3, 12 F for size 4] was inserted through the drain tube if there was no air leak up to the drain tube. Correct gastric tube placement was assessed by suction of fluid or detection of injected air by epigastric stethoscopy. The success rate was 90 % for gastric tube insertion in Igel group.

POSTOPERATIVE AIRWAY MORBIDITY

Patients were asked about sore throat [constant pain/independent of swallowing], dysphonia [difficulty/pain during speaking] and dysphagia [difficulty/pain on swallowing] and recorded .Regarding the postoperative airway morbidity there were 2 cases of airway morbidity in I-gel group compared with 2 cases in LMA group which is clinically and statistically insignificant. In I-gel group one patient reported sore throat and another patient had pain on swallowing .In LMA group one patient had blood staining on device and another patient had sore throat. This finding was similar to the previous study done by Ashish Kannaujia Department of Anesthesia and critical Care, S.N.Medical College Agra [4] and Amr M Helmy, Hossam M Atef, Ezzat M El Taher, Ahmed Mossad Henidak Department of Anaesthesia and Intensive Care, Ismailia, Egypt. [5]

ADVERSE RESPIRATORY EVENTS

No patients in any of the groups had any adverse respiratory event like episodes of hypoxia [spo2<90%] or laryngospasm.

5.CONCLUSION

To conclude, the insertion time of I-gel is shorter in comparison with LMA and the seal pressure achieved was better in I-gel group than LMA group. The success rate of insertion, incidence of trauma and postoperative airway morbidity oxygen saturation are similar in both I-gel and LMA group.

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