



COMPARATIVE STUDY OF SUPRAGLOTTIC AIRWAY DEVICES CLASSIC LMA, PROSEAL LMA AND I-GEL IN ADULT PATIENTS

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ABSTRACT

BACKGROUND: The LMA has been used more than 150 million times world wide without a single death directly attributed to its use compare the supraglottic airway devices I-GEL, Proseal LMA and Classic LMA.

AIMS: This study to evaluate the hemodynamic changes, time of insertion, ease of insertion, attempts of insertion, gastric tube passage & post op complications.

METHODS: 90 patients were randomized into three groups. (each group 30 patients). Group C- Classic LMA, Group P- Proseal LMA, Group I- I-GEL

RESULTS: The airway leak pressure of the Proseal LMA group (22.06 ± 1.17 cmH₂O) was significantly higher than that of the I GEL group (21.9 ± 2.17 cmH₂O) and the C LMA group (20.13 ± 1.24 cmH₂O). The success rates for first attempt of insertion were similar among the three devices. There were no differences in the incidence of postoperative airway trauma, sore throat or hoarse cry in all the three groups

CONCLUSION: Both I-GEL, P LMA have an added advantage of gastric channel comparing these 2 devices easy passage of gastric tube through P LMA was easier than I GEL group.

KEYWORDS : supraglottic airway device, insertion, laryngeal mask airway, gastric tube passage

1.INTRODUCTION

Supraglottic airway devices standard equipment in airway management stands between the face mask and tracheal tube in terms of both position and degree of invasiveness [1]. Device that is used to ventilate the patient above the level of vocal cords. The LMA has been used more than 150 million times world wide without a single death directly attributed to its use. [2]. These devices fit outside the trachea but provide a hands free means of achieving a gas-tight airway. It has well established role in management of patients normal to difficult airway.[3]

2.AIM:

This prospective study to compare the supraglottic airway devices I-GEL, Proseal LMA and Classic LMA. This study to evaluate the hemodynamic changes, time of insertion, ease of insertion, attempts of insertion, , gastric tube passage & post op complications.

3.MATERIALSANDMETHODS:

Informed and written consent were obtained. 90 ASA I & II Patients scheduled for general and gynecological surgery under general anaesthesia in Government Rajaji hospital Madurai were included in this study. 90 patients were randomized into three groups. (each group 30 patients). Group C- Classic LMA, Group P- Proseal LMA, Group I- I-GEL

INCLUSION CRITERIA

- 1) Elective surgeries under general anaesthesia
- 2) Both sexes
- 3) Age :18-60 years
- 4) ASA I&II

EXCLUSION CRITERIA

- 1) ASA III & ASA IV
- 2) Age <18 & >60 years
- 3) Mallampatti GRADE III & above
- 4) Emergency surgeries
- 5) Head & neck surgeries
- 6) patients with decreased mouth opening, BMI > 28 kg/m²
- 7) patients with increased risk of aspiration, decreased lung compliance
- 8) patient with abnormal an distorted anatomy of pharynx obstructed airway beyond the larynx

ANAESTHETIC TECHNIQUE:

All patients were premedicated with Inj. glycopyrrolate 0.2 mg &

inj.fentanyl 2 mcg/kg & induced with Inj.propofol 2mg/kg and Inj.succinylcholine 2mg/kg, according to the allotted group supraglottic airway device was inserted. Cuff inflation done with 20 ml of air with sterile new syringe for CLMA, PLMA. The expiratory valve closed and fresh gas flow (only oxygen) 3 liter was kept stethoscope was kept in front of mouth, positive pressure ventilation was given. At which pressure in the manometer of the closed circuit the audible sound heard was noted. that pressure was taken as the corresponding device sealing pressure. After that anaesthesia was maintained with N₂O:O₂ 66% : 33% and Inj. Atracurium 0.1mg/kg or inhalational agents (sevoflurane & isoflurane) depends upon the duration of the procedure. At the end of the procedure removal done after patients awaken. gastric tube insertion done during intra op period.

4.RESULTSANDDISCUSSION

There were no differences in the demographic and hemodynamic data among the three groups. The airway leak pressure of the Proseal LMA group (22.06 ± 1.17 cmH₂O) was significantly higher than that of the I GEL group (21.9 ± 2.17 cmH₂O) and the C LMA group (20.13 ± 1.24 cmH₂O).

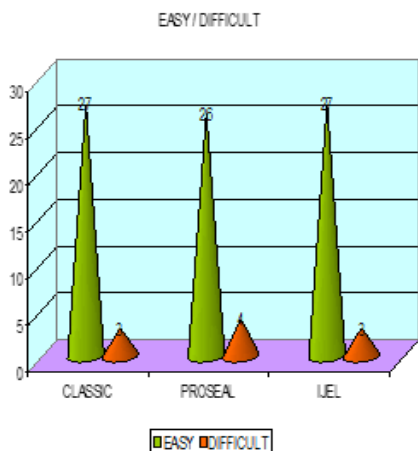
The success rates for first attempt of insertion were similar among the three devices. There were no differences in the incidence of postoperative airway trauma, sore throat or hoarse cry in all the three groups

TABLE – 1 NUMBER OF ATTEMPTS

ATTEMPTS	CLASSIC	PROSEAL	IJEL
A 1	25	26	27
A 2	5	4	3
TOTAL	30	30	30
Mean	1.167	1.133	1.1
SD	0.379	0.346	0.305
P	0.756 Not significant		

A gastric tube was easily passed through PLMAs 26 patients (12 Fr) easily when compare to I GEL which was 16 patients. in first attempt with statistical significant p value < 0.001. Insertion at second in PLMA group only in 4 patients and it was 12 in I GEL group. Insertion done at third attempt was 2 in I GEL group and nil in Proseal group.

FIGURE1–METHOD-EASY/DIFFICULTY



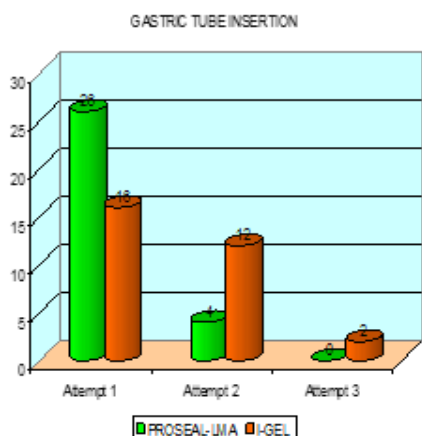
The hemodynamic parameters like Noninvasive blood pressure (NIBP), Heart rate (HR) and SpO2 were comparable in all groups. There was neither desaturation nor any significant change in NIBPP and HR during before and after insertion, intraop, after removal of airway in any case. There was no laryngospasm in any patient.

TABLE –3 :AWP

AWP	CLASSIC	PROSEAL	IJEL
<20	17	2	3
>20	13	28	27
TOTAL	30	30	30
Mean	20.133	22.067	21.9
SD	2.177	1.172	1.242
P	<0.001 Significant		

Blood staining was observed in four and two cases each in the PLMA and cLMA groups, respectively, and in one case in the igel group. Sore throat was observed in 1 patient, 3 patients I gel, proseal and classic LMA groups respectively.

FIGURE 2 : GASTRIC TUBE INSERTION



The Igel is a new singleuse, noninflatable supraglottic device or use in anaesthesia during spontaneous or intermittent positive pressure ventilation. It is an anatomically designed mask made of a gel like thermoplastic elastomer with a soft durometer and gel like feel. It has a channel for gastric catheter placement, except for size 1. The soft, noninflatable cuff fits snugly onto the perilaryngeal framework, mirroring the shape of the epiglottis, aryepiglottic folds, piriform fossae, perithyroid, peri cricoid, posterior cartilages and spaces. Thus, each structure receives an impression fit, supporting the seal by enveloping the laryngeal inlet. The seal created is sufficient for both spontaneously breathing as well as paralyzed patients. Studies in

adults have been promising, showing an easy insertion, high airway leak pressures and low complication rates, with few postoperative complaints.

ATTEMPTS & EASE OF INSERTION:

In this study, we found that insertion of the igel was successful on the first attempt in 27 of 30 patients and comparable to 26 of 30 in the PLMA group and 25 of 30 in the cLMA group. In that study, the success rate for inserting the device was 90% on the first attempt and 100% after two attempts.

The ease of insertion was graded as easy or very easy in all the cases in the igel and the cLMA groups and 83.33% on first attempt, 86.66% in the PLMA groups.

TIME OF INSERTION:

The time taken for inserting all 3 supraglottic devices were statistically not significant. Less than 15 seconds duration for I GEL, PLMA, CLMA are 5, 1, 5 respectively. Time duration 16-30 seconds for I GEL, PLMA, CLMA are 23,29,23 patients respectively. More than 31 seconds required for 2 patient in classic LMA group, 2 patients in I-GEL group, nil in PLMA group.

GASTRIC TUBE PASSAGE :

All 3 supraglottic airway devices are easier to insert. We experienced difficulty in passing a 12 Fr tube through the gastric channel of the igel. The number of second attempts for passing the gastric tube (12 Fr) in the igel group was significantly higher compared with the PLMA group (12 Fr tube). Size we believe that a 12 Fr gastric tube would be a better option for the size 3 igel.

COMPLICATIONS:

The incidence of complications (airway trauma and sore throat) was very low in all cases, except for blood staining in a few patients of PLMA group and C LMA groups, which was neither clinically important nor statistically significant. Other studies have also reported a similar incidence.

Although igel inserts less pressure on the perilaryngeal tissue because of its noninflatable cuff, the incidence of sore throat was comparable in all three groups. This observation of our study is supported by the study of Lopez et al where they stated that sore throat could be minimal even with supraglottic devices with inflatable cuff, if the intracuff pressure remains less than 60 cm H2O[4]

HEMODYNAMIC CHANGES:

All other parameters like NIBP, HR, SPO2 during insertion, after 5 minutes, intraop period, during removal, after removal were not significant

DEMOGRAPHIC FACTORS:

All the 3 groups were comparable and there was no statistically significant difference with regards to mean age, weight, sex, duration and type of surgery. We concluded that All three supra glottic airway devices (I gel, Proseal, Classic LMA) can be used safely during GA and positive pressure ventilation. Comparatively P LMA had higher sealing pressure than I – gel and classic LMA. There was no significant difference between the three devices in terms of ease of insertion time taken to insert, hemodynamic changes during peri operative period. Both I-GEL, P LMA have an added advantage of gastric channel comparing these 2 devices easy passage of gastric tube through PLMA was easier than I GEL group.

5. CONCLUSION

All three supra glottic airway devices (I gel ,Proseal, Classic LMA) can be used safely during GA and positive pressure ventilation in selected patients during GA and positive pressure ventilation. There was no significant difference between the three devices in terms of ease of insertion time taken to insert, hemodynamic changes during perioperative period. Both I-GEL, P LMA have an added advantage of gastric channel comparing these 2 devices easy passage of gastric tube through P LMA was easier than I GEL group.

6. REFERENCES

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