ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 07 | July - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

TO COMPARE THE PLACEMENT AND EFFICACY OF I-GEL AND PROSEAL LARYNGEAL MASK AIRWAY IN ADULT PATIENTS UNDERGOING ELECTIVE SURGERIES

Anaesthesiology

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ABSTRACT

Objectives : The present study was conducted to compare the placement and efficacy of two supraglottic airway devices, PLMA and I-gel in adult patients undergoing elective surgeries. **Methods :** 100 patients scheduled for elective surgery under general anaesthesia , ASA grade 1and 2, were randomly divided into two groups of 50 patients each, Group I and Group P in which Igel and Proseal was used respectively. The devices were studied on the basis of number of attempts, insertion time, ease of insertion, quality of airway, fibre optic grading, orogastric tube test, haemodynamic changes and postoperative complications, **Results :** I-gel was better than Proseal in terms of number of attempts, insertion time, ease of insertion. The quality of airway and placement of the device and orogastric tube were comparable in both per the groups.The haemodynamic changes during insertion and after removal of the device was also comparable. **Conclusion:** The study showed that Igel and Proseal are comparable in term of placement, adequate ventilation and respiratory mechanics.Also I-gel is more easier to insert and with lesser complications. **Aims and Objectives:** To compare the placement and efficacy of I- gel and Proseal laryngeal mask airway in adult patients undergoing elective surgeries.

KEYWORDS

INTRODUCTION

The major responsibility of the anaesthesiologist is to provide adequate ventilation to the patient(1). Though tracheal intubation remains the gold standard for maintaining patent airway(2), supraglottic airway devices were developed in 1981 at the Royal London Hospital, Whitechapel in the East End of London by Dr. Archie Brain(3).

The Proseal laryngeal mask airway (PLMA) was introduced in 2000 and it's design was based on classic LMA. The main modification was a posterior extension of the mask cuff and a drainage tube exiting at the mask tip. Oropharyngeal leak pressure of around 30 cm water can be achieved which allowed for ventilation with higher tidal volumes and airway pressures. The presence of DT reduced the risk of aspiration(4). However, the cuff needs to be inflated to create a seal around the perilaryngeal tissues,so, there is a potential to cause tissue damage, venous compression and nerve injury(5,6).

The I-gel was developed in 2007 to overcome the drawbacks of PLMA. It is designed to fit the perilaryngeal and hypopharyngeal structures without the use of an inflatable cuff and hence providing with advantages like easier insertion and minimal risk of tissue injury. Various studies have been conducted to evaluate the efficacy of the devices but none have been conclusive of the superiority of either device.

Our study is planned to compare the placement using fiberoptic bronchoscope and the efficacy of I-gel and PLMA on the basis of ease of insertion, insertion attempts, insertion time, quality of airway, ease of gastric tube placement and complications.

MATERIAL AND METHODS

The present study was conducted in Department of Anaesthesiology, MMIMSR, Mullana. 100 healthy adult patients were included in the study as per following

Inclusion criteria:

1. ASA grade 1 and 2 of either sex
2. 18-60 years age group
3. Mallampati garde 1 and 2
4. Elective surgeries under general anaesthesia

Exclusion criteria:

1. Any underlying disease
2. Pregnant patients
3. Emergency surgeries
4. Obese patient
5. Cervical disease
6. Head and neck surgeries

Study design : Prospective, Randomized trial

The study population was randomly divided into two groups with 50 patients each
Group P: Insertion of PLMA
Group I : Insertion of I-gel

A thorough pre anaesthetic checkup was done and all routine investigations were carried out. A written informed consent was taken. All patients were kept nil per oral overnight and received alprazolam 0.25mg and ranitidine 150 mg orally, the night before surgery and in the morning of surgery.

In the operation theatre, HR, systolic blood pressure(SBP), diastolic blood pressure(DBP), mean arterial pressure(MAP) , ECG, Oxygen saturation (SpO2) monitoring was performed and the baseline parameters were recorded. The anaesthetic induction was performed as per institutional protocols,and appropriate size of PLMA or I- gel were inserted to the standard recommended insertion technique. A flexible fiberoptic bronchoscope was introduced into the airway tube for viewing and scoring the laryngeal structure after fixation of the device.

The following parameters were observed

1. Number of attempts at PLMA/ I-gel insertion
2. Insertion time
3. Ease of insertion of the supraglottic device (very easy, easy, difficult)
4. Quality of the airway (excellent, good, poor)
5. Fiberoptic grading of the view through airway tube (grade 1,2,3,4)
6. HR, NIBP, SpO2, ETCO2, ECG, before induction, at the time of insertion, 2 minutes and 5 minutes after insertion and after removal of the device.
7. Orogastric tube test (easy, difficult, failed)
8. Any adverse effect during the insertion and after removal of the device
9. Degree of sore throat, cough and hoarseness of voice in PACU.

OBSERVATIONS AND RESULTS

1. The difference in the number of attempts between the two groups was found to be statistically significant (p value 0.023). The success rate of placement in first attempt was higher in the I-gel Group.
2. The difference between the two groups with regard to mean insertion time was shorter for I-gel as compared to PLMA.
3. The insertion of PLMA in group P was graded very easy in 35(70%) patients, easy in 11(22%) patients and difficult in 2(4%)

patients. The p value was 0.046 which is statistically significant difference between the two groups indicating that I-gel is easier to insert.

4. 38 of 50 (76%) patients in group P had excellent (no audible leak) while 12 (24%) had good (an audible leak with relevant loss of air but sufficient ventilation, EtCO2<40mmHg) quality of airway. 42 of 50 (84%) patients in group I, the quality of airway was excellent and in 8(16%) patients the quality of airway was good Hence, when compared there was no significant difference in the quality of airway in both the groups. (P value = 0.317).
5. In 39 of 50 (78%) patients of group P and in 46 of 50 (92%) patients of group I, only vocal cords were visible using a fiberoptic bronchoscope while in 9 of 50 (18%) patients of group P and in 4 of 50 (8%) patients of group I, vocal cords and posterior epiglottis was visible. Vocal cords and anterior epiglottis was visible only in 2 of 50 (4%) patients of group P. There was no patient in both the groups in which vocal cords could not be seen. There was no significant difference in the fiberoptic grading of the patients between group P and I (p value= 0.107).
6. There was no significant difference in HR, SBP, DBP, MAP, EtCO2 during the insertion and removal in both the groups.
7. In 42 of 50 (84%) patients in group P and 48 of 50 (96%) patients in group I, the orogastric tube was placed in one attempt while in 8 of 50 (16%) patients in group P and in 2 of 50 (4%) patients of group I, the orogastric tube was placed in two attempts. There was no incidence of failure of orogastric tube insertion in both the groups.When compared, Pavlodar was 0.046 which is statistically significant difference between the two groups.
8. The incidence of presence of blood stain on the device was more in the Proseal group than I -gel.
9. The incidence of sore throat was not statistically significant between both the groups. Postoperative cough was more with the group P compared to group I.

DISCUSSION

In our study insertion of I-gel was successful in first attempt in 84% cases as compared to 64% first time insertion with PLMA. Second attempt was required in 16% cases with I-gel as compared to 36% with PLMA.When both the groups were compared, results were found to be statistically significant (p = 0.023) indicating lesser number of attempts with I- gel. Our results were also similar to studies conducted by Ekinci O et al (7) , Kini G et al (8) and Jadhav PA et al.

In our study the mean time required for inserting the PLMA and I-gel was 16.56+- 4.3 and 14.3+-3.2 seconds respectively.Statistically, this result was highly significant (p value=0.004). Consistent with our results, Chauhan G et al, Das A et al, Kini G et al , Jadhav A et al, also showed significant differences in insertion times with less time required for I-gel insertion.

In our study, the ease of insertion of PLMA was very easy in 35 (70%) patients, easy in 11 (22%) patients and difficult in 4 (8%) patients. In group I, insertion of I-gel was very easy in 45 (90%) patients, easy in 3 (6%) and difficult in 2 (4%) patients.When compared, there was statistically significant difference (p=0.046) between the two groups. Similar results were seen by Chauhan G et al.

In our study, there was no significant difference in the quality of the airway in both the groups similar to the studies conducted by Bordes et al (51) and Beylacq et al (52).

In our study, we followed the fiberoptic grading system by Brimacombe et al (20) and found that both groups were comparable with regard to fiberoptic view of larynx.

The ease of insertion of orogastric tube was studied by the grading similar to study by Chauhan et al (37). In our study, there was significant difference in the insertion of orogastric tube (p value = 0.046)

Since, I-gel is a non inflatable device and placement of PLMA involves inflation of the cuff, there might be difference in haemodynamic changes. The observations made in this study relating to this study showed increase in HR and DBP after insertion of PLMA. This is in accordance with study results of Das A et al (48),and Jindal P et al (50).

Our study had several limitations. Firstly, it was unblinded and secondly, the quality of airway was only measured once, at the start, although quality of airway may change over time.

CONCLUSION

Henceforth, we conclude that I-gel and PLMA are comparable in terms of placement, providing adequate ventilation and respiratory mechanics. Also , I-gel is more easier to insert in terms of attempt and lesser time for insertion. Also, there are less haemodynamic changes and lesser complications with insertion of I-gel.

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