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Original research article

Comparison of ease of insertion of LMA proseal and I-gel with dexmedetomidine

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Abstract

Background: In spite of tremendous advances in contemporary anesthesia practice, airway management continues to be of paramount importance to the anesthesiologist. Hemodynamic changes are the major undesirable consequences of endotracheal intubation and laryngoscopy. The supraglottic airway device is a novel device that fills the gap in airway management between tracheal intubation and use of face mask. In view of this, the present study was undertaken to compare the performance of two supraglottic airway devices LMA Proseal and I-gel.

Methodology: Sixty ASA I-II patients scheduled for elective surgeries under general anaesthesia were randomised into two groups of 30 each. In Group P (n=30) LMA Proseal and Group I (n=30) I-gel were used respectively. Both the devices were compared in relation to ease of insertion assessed in terms of Modified Lund and Stovener criteria, jaw relaxation based on Young's criteria, number of attempts for insertion and hemodynamic changes.

Results: The insertion conditions of LMA were better in I-gel group than LMA Proseal. Number of attempts were required less in I-gel group (1^{st} attempt group I -93.3%; group P – 83%; P value<0.05). Hemodynamic changes were significant between the two groups. I-gel had better hemodynamics than Proseal LMA. Blood staining on the device was present in 6% of the cases in I-gel group and 26.6% in group P which is significant.

Conclusion: Both LMA Proseal and I-gel can be used safely and effectively in selected patients undergoing general anaesthesia. I-gel is easy to insert compared to LMA Proseal.

Keywords: Laryngeal mask airway, proseal LMA, I-gel

Introduction

In spite of tremendous advances in contemporary anesthesia practice, airway management continues to be of paramount importance to anesthesiologist. Till date, the cuffed endotracheal tube was considered as gold standard for providing a safe glottic seal.

Respiratory morbidities are the most common anaesthesia related complications, following dental damage during endotracheal intubation. The three main causes of respiratory related morbidities are inadequate ventilation, oesophageal intubation and difficult tracheal intubation. Difficult tracheal intubation accounts for 17% of the respiratory related injuries and results in significant morbidity and mortality. In fact up to 28% of all anaesthesia related deaths are secondary to inability to mask ventilate or intubate.

Laryngoscopy and endotracheal intubation produce reflex sympatho-adrenal stimulation and are associated with raised levels of plasma catecholamines, hypertension, tachycardia etc. Airway devices can be classified as intraglottic and extraglottic airway devices, which are employed to protect the airway both in elective as well as emergency situations.

Objectives

The primary objective of the study was to compare LMA Proseal and I-gel for ease of insertion based on Modified Scheme of Lund and Stovener, jaw relaxation based on Young' criteria, number of attempts for insertion in adult patients undergoing elective surgeries.

The secondary objectives were to assess the change in hemodynamic responses in both the groups.

Materials and Methods

The present study titled "Comparison of ease of insertion of laryngeal mask airway proseal and i-gel with dexmedetomidine: A randomized clinical trial" was conducted in the department of anaesthesiology, in a tertiary centre from December 2016- August 2018.

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The study was undertaken after obtaining ethical committee clearance as well as informed consent from all patients. Sixty patients, scheduled for various elective surgical procedures undergoing general anaesthesia belonging to ASA class I and II were included in the study.

Inclusion criteria

1. Patients aged 18-60 yrs.
2. American society of anesthesiologist's(ASA) grade I and II
3. Scheduled for elective surgery under general anesthesia
4. Patients with valid written consent

Exclusion criteria

1. Emergency surgeries.
2. ASA grade III and IV.
3. Patients with cardiac and respiratory diseases.
4. Risk of gastric aspiration.
5. Patients suffering from pharyngeal pathology.
6. Low pulmonary compliance.
7. Patients with history of hypersensitivity reactions
8. Cervical spine fracture or instability

Results

Comparison of Demographics and other Characteristics

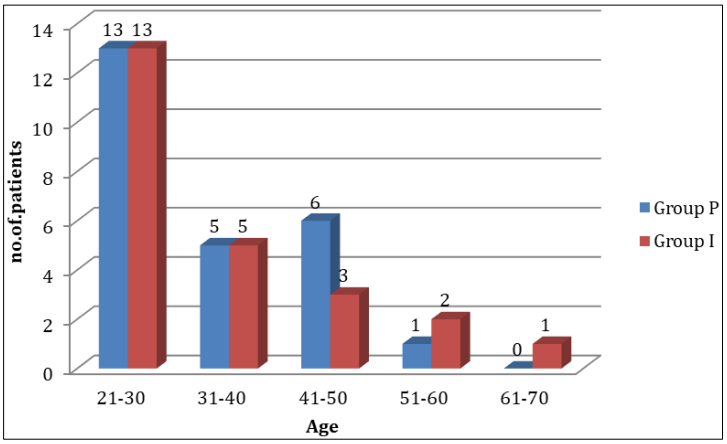
Table 1: There are no statistically significant difference between the 2 groups

Demographics	Group P (n=30)	Group I(n=30)	P value
Age mean +/- SD	30.9(± 10.49)	31.23(±12.7)	0.912
Gender male/female	12/18	12/18	0.817
Weight +/- SD	53.33(±11.69)	54.83(±11.44)	0.756

Table 2: Showing age distribution of groups

Age (years)	Group (Proseal LMA)		Group (I GEL)	
	No. of patients	%	No. of patients	%
<20	5	16.67	6	20.00
21-30	13	43.33	13	43.33
31-40	5	16.67	5	16.67
41-50	6	20.00	3	10.00
51-60	1	3.33	2	6.67
61-70	0	0	1	3.33
Total	30	100	30	100
Mean age (±SD)	30.9(±10.49)		31.23(±12.7)	
Minimum age	16		15	
Maximum age	54		67	

t=0.111, p=0.912, NS



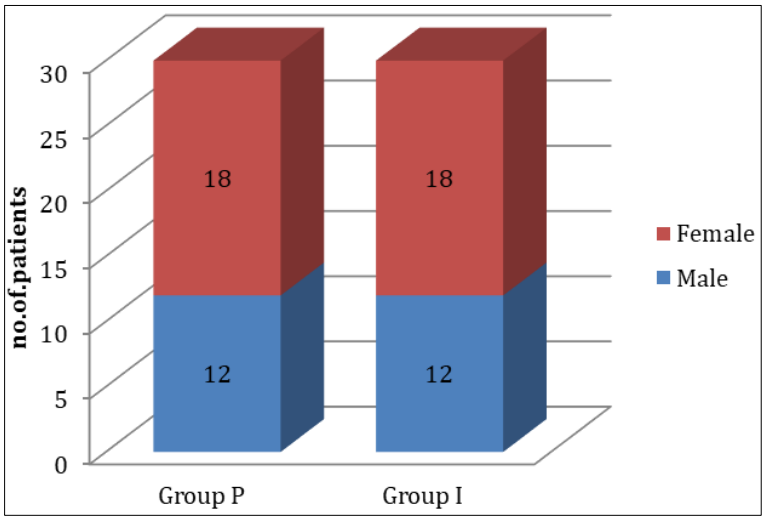
Graph 1: Showing age distribution

Table and graph shows age distribution of the patients in both the groups. The minimum age in group LMA-P and group I-gel was 16 years and 15 years respectively. The maximum age group LMA-P and group I-gel was 54 years and 67 years respectively the mean age in group LMA-P and group I-gel was 30.9 and 31.23 years respectively.

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 01, 2023

Table 3: Showing gender distribution

Gender	Group P		Group I	
	No. of patients	%	No. of patients	%
Male	12	40	12	40
Female	18	60	18	60
Total	30	100	30	100



Graph 2: Showing gender distribution

From the above table and graph it is seen that group P had 12 males and 18 females, group I had 12 males and 18 females there was no statistical difference between two groups ($p>0.05$)

Table 4: Showing types of surgical procedure

Sl. No	Type of surgical Procedures	Group ((proseal LMA) No. of Patients	Group I (I-gel) No. of Patients
1	Lap appendicectomy	1	1
2	BAT	2	2
3	Debridement	4	2
4	Excision	12	9
5	I&D	2	4
6	Lap appendicectomy	1	4
7	Lap tubectomy	2	4
8	ORIF with plating	1	0
9	Polypectomy	1	0
10	Repair	1	0
11	Simple Mastectomy	3	2
12	Herniorraphy	0	1
13	Open Cholecystectomy	0	1
Total		30	30

Discussion

The major responsibility of the anesthesiologist is to provide adequate ventilation to the patient. The most vital element in providing respiration is maintenance of patent airway. The tracheal intubation is the gold standard method for maintaining a patent airway during anaesthesia.

The supraglottic airway device is a novel device that fills the gap in airway management between tracheal intubation and use of face mask.

Proseal laryngeal mask airway has a dorsal cuff, in addition to the peripheral cuff of LMA, which pushes the mask anterior to provide a better seal around the glottic aperture. I-gel is a novel supraglottic airway device without any inflatable cuff creating anatomical seal with perilaryngeal structures.

There are many literature comparing both these devices with contradictory results.

Thus, this study was designed to compare the ease of insertion of LMA-Proseal and I-gel with dexmedetomidine based on Modified Lund and Stovener criteria, jaw relaxation, insertion attempts, duration of insertion, and any complications in patients undergoing elective surgeries under general anaesthesia.

A total of 60 ASA grade I-II patients aged 18-50 who were scheduled for surgery under general anaesthesia were randomized into two groups 30 in each and enrolled in our study.

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Age incidences between two groups were comparable. Most of the patient's age in both the groups ranged from 21 -30yrs. The difference between two mean ages are not statistically significant.

Conclusion

The study was conducted to evaluate the clinical utilization of the two airway devices Proseal LMA and I-gel in elective surgical procedures. With the above study I-gel was better in view of ease of insertion, placement was rapid and also less traumatic to airways than Proseal LMA. So I-gel is a cheap and effective SGD alternative to Proseal LMA.

Summary

The present study titled "Comparison of laryngeal mask airway proseal and i-gel in patients posted for elective surgeries under general anaesthesia-" was conducted in the department of anaesthesiology, Navodaya Medical College Hospital and Research Centre

Sixty ASA I-II patients scheduled for elective surgeries under general anaesthesia were randomized into two groups of 30 each as Group P (n=30) LMA proseal and Group I (n=30). Both the devices were compared in relation to ease of insertion assessed in terms of attempts taken and duration, hemodynamic changes and device related postoperative complications.

- Between the two groups there is no demographic differences
- When compared to Proseal LMA the ease of insertion for I –gel was easier
- When compared to Proseal LMA the attempts required to insertion was less for I – gel
- When compared to Proseal LMA the time required for insertion of I-gel was less in duration.
- Between Proseal LMA and I-gel groups there were significant hemodynamic changes
- Use of dexmedetomidine before induction provided better ease of insertion in I-gel group compared to proseal.
- Blood staining of the device was found more in the Proseal LMA group than I-gel group

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