

# Ease of insertion of laryngeal mask airway Proseal and I-gel with Dexmedetomidine

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## Abstract

**Background:** Respiratory morbidities are the most common anaesthesia related complications, following dental damage during endotracheal intubation. Difficult tracheal intubation accounts for 17% of the respiratory related injuries and results in significant morbidity and mortality. There are numerous literature on comparison between these two supraglottic airway devices with contradictory results. **Objective:** 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. **Methodology:** It is a RCT involving Sixty patients, scheduled for various elective surgical procedures undergoing general anaesthesia belonging to ASA class I and II were included in the study. The patients were divided in two groups Group P-proseal, Group I-I gel 30 each. **Results:** The mean age in group LMA-P and group I-gel was 30.9 and 31.23 years respectively. Majority of cases were from Grade I in both P (66.7%) and I (83.3%) groups. The attempt of insertion was statistically significant between the two groups ( $p < 0.05$ ). Time required in Group I is less compared to group P in our study. **Conclusion:** I-gel is a cheap and effective SGD alternative to Proseal LMA.

**Key words:** laryngeal mask airway, Proseal, I-gel, Dexmedetomidine.

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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.<sup>2</sup> Laryngoscopy and endotracheal intubation produce reflex sympatho-adrenal stimulation and are associated with raised levels of plasma catecholamines, hypertension, tachycardia etc.<sup>3</sup> 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.<sup>4</sup> The supraglottic airway device is a novel device that fills the gap in airway management between tracheal intubation and use of face mask. Dr. Archie Brain a British anaesthesiologist, for the first time introduced the laryngeal mask airway designed to be positioned around the laryngeal inlet that could overcome the complications associated with endotracheal intubation, and yet be simple and atraumatic to insert. Careful observations and clinical experience have led to several refinements of Brain's original prototype leading to development of newer supraglottic airway device with better features for airway maintenance.<sup>5</sup> A new supraglottic airway device is I-gel. It is a non cuffed device containing drainage tube to prevent

## 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.<sup>1</sup> 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

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regurgitation and aspiration of gastric contents. I-gel is designed to create anatomical seal to the perilaryngeal structures. There are numerous literature on comparison between these two supraglottic airway devices with contradictory results. Dexmedetomidine is selective alpha 2 receptor agonist which has anaesthetic and analgesic effect in addition to its sedative effect. When dexmedetomidine is used perioperatively the induction and maintenance dose of propofol is reduced.

The main aim of this study is to compare the clinical efficacy of LMA Proseal and I-gel for ease of insertion and hemodynamic responses with dexmedetomidine in adult patients undergoing elective surgeries.

**Objective:** To compare LMA Proseal and I-gel for ease of insertion based on Modified Scheme of Lund and Stovener, jaw relaxation based on Young's criteria, number of attempts for insertion in adult patients undergoing elective surgeries.

## METHODOLOGY

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

## RESULTS

**Table 1:** Distribution according to age

Age in years	Number	Percent	Number	Percent
<20	5	16.67	6	20
21-30	13	43.33	13	43.33
31-40	5	16.67	5	16.67
41-50	6	20	3	10
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

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.

- 3) Scheduled for elective surgery under general anaesthesia

- 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

**Study design:** Prospective, randomized clinical study

**Sampling technique:** In this study 60 patients were divided randomly into two groups. Allocation into two groups was done by computer generated randomization table. Sixty(60) patients scheduled for different elective surgeries under general anaesthesia were randomly allocated to one of the two groups of 30 patients each group.

Group P - Patients were inserted with LMA Proseal (n=30)

Group I - Patients were inserted with I-gel (n=30)

### Statistical Analysis

Statistical analysis was done using SPSS software 16.0. Data obtained is tabulated in the Excel sheet analysed. All values are expressed as mean ± standard deviation. Chi-square test for proportions in qualitative data. Student's unpaired t-test for Quantitative data. P< 0.05 was considered statistically significant.

**Table 2:** Distribution according to type of surgery

Sl. No	Type of surgical Procedures	Group P	Group I
		(proseal LMA) No. of Patients	(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
<b>Total</b>		<b>30</b>	<b>30</b>

In group P, majority of the cases were of excision i.e.12 and in group I 9 cases of excision were done.

**Table 3: Insertion conditions of LMA**

	Group P	Group I	P value
I	20(66.7%)	25(83.3%)	0.03 (<0.05) Significant
II	8(26.7%)	4(13.3%)	
III	2(6.7%)	1(3.4%)	
IV	0	0	

In our study we observed that majority of cases were from Grade I in both P (66.7%) and I (83.3%) groups

**Table 4: Distribution according to jaw relaxation**

Grades	Group P	Group I	p value
I	22(73.3%)	25(83.3%)	0.04 (<0.05) significant
II	8(26.7%)	5(16.7%)	
III	0	0	

Jaw relaxation of grade I was seen in 22 patients in Group P and 25 cases in Group I

**Table 5: Number of attempts required**

Attempts	Group I	Group P	P value
1 <sup>st</sup> attempt	28	25	<0.05
2 <sup>nd</sup> attempt	2	5	<0.05

This table shows 28 of 30 insertions in group I were in the first attempt and only 2 patients required 2<sup>nd</sup> attempt. 25 of 30 in the group P required only one attempt and 5 patients required 2<sup>nd</sup> attempt. The attempt of insertion was statistically significant between the two groups (p<0.05)

**Table 6: Insertion time in both groups**

GROUP	GROUP I	GROUP P	P value	t value
Time in sec (mean duration)	15.90±2.52	17.80±1.69	0.001	3.4

Time required in Group I is less compared to group P in our study

## DISCUSSION

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. 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. The male to female ratio in group P is 12/18 and in group I is 12/18. There is no statistical difference between the groups. In our study the overall condition for the device insertion was assessed by Modified Lund and Stovener criteria and jaw relaxation using Young's criteria. Nellore SS, *et al*<sup>6</sup> conducted study and found that propofol with dexmedetomidine provides

excellent overall insertion conditions and hemodynamic stability. This is in accordance with our study where we used dexmedetomidine with propofol.

The ease of insertion of I-GEL was easy for 93% of cases (28) and 7% (2) of cases had difficult Insert ion. The Proseal shows 83.3% cases (25) had easy insertion and 16.7% of cases (5) had difficulty in insertion. This is statistically significant in p value of < 0.05. The study conducted by Ishwer Singh and the Monika Gupta<sup>7</sup> shows in view of ease of insertion for I-GEL was better than PLMA.

Levitan and Kinkle<sup>8</sup> presumed that on insertion of LMA with inflatable mask the deflated leading edge of the mask can catch the edge of the epiglottis and cause it to down fold or impede proper placement of the tongue.

Brimacombe *et al*<sup>9</sup> presumed that difficulty in inserting the LMA-Proseal was caused by larger cuff impeding digital intraoral positioning and propulsion into the pharynx, the lack of backplate making cuff more likely to fold over at the back of the mouth.

Chauhan *et al* and Singh *et al*<sup>10</sup> observed the ease of insertion was better with I-gel than Proseal. Chauhan *et al* also observed the number of manipulations required were more in PLMA resulting in hemodynamic changes. In our study duration of insertion of I- GEL had a mean duration of 15.90. The Proseal had a mean duration of insertion 17.80. So in duration of attempts of I-GEL versus Proseal LMA was statistically significant has p value of <0.05. Therefore, in view of duration attempts the I-GEL was better than Proseal. The study conducted by Gattward & T.M. Cook<sup>11</sup> shows the duration of attempts was less for I-GEL. I-GEL had 6% of cases with blood staining in device after removal and 93.3% of cases had no blood staining in device after removal. Proseal had 26.7% of cases with blood staining on device after removal and 73.3% of cases had no blood staining on device after removal. This shows statistically significant in blood staining of device after removal with p value of < 0.05. So I-GEL was less blood staining in device than Proseal.

## CONCLUSION

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.

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