

A study of ease of I-GEL insertion

Pramod Bhale¹, Chidanand Nazirkar^{2*}, Apurva Deshmukh², Mitalee Pareek²

¹Professor, ²Resident, Department of Anaesthesia, MGM Medical College, Aurangabad, Maharashtra, INDIA.

Email: pramod.bhale@gmail.com

Abstract

Background and Aims: This randomized, open label experimental study was undertaken to observe the ease of insertion and time taken for insertion of I-GEL. **Methods:** Thirty adult patients undergoing elective surgery under general anaesthesia were assessed. Ease of insertion of I-GEL was assessed with number of attempts required for insertion. Time taken for insertion and post-operative side effects of I-GEL insertion were also observed. **Results:** The demographic profile of patients was comparable. In our study out of 30 patients, I-gel was inserted in first attempt in 25 (83.3%) patients, only 5 (16.7%) patient's required second attempt. Mean time taken for insertion of I-gel was 7.27 ± 2.74 seconds. Hemodynamic response to insertion were similar in all patients and adverse effects were not significant. **Conclusion:** The I-GEL takes approximately 8 seconds for insertion, with non-significant post-operative adverse effects. I-GEL can be considered as preferred choice of airway for elective surgeries under general anaesthesia.

Key Words: Supraglottic airways, I-GEL, General anaesthesia

*Address for Correspondence:

Dr. Chidanand Nazirkar, Resident, Department of Anaesthesia, MGM Medical College, Aurangabad, Maharashtra, INDIA.

Email: pramod.bhale@gmail.com

Received Date: 11/09/2019 Revised Date: 10/10/2019 Accepted Date: 06/11/2019

DOI: <https://doi.org/10.26611/1015121216>

Access this article online

Quick Response Code:



Website:

www.medpulse.in

Accessed Date:
09 November 2019

elements to minimize this risk. They provide higher airway leak pressure⁶ than the classic LMA and can be used for spontaneous as well as positive pressure ventilation. The I-gel airway is a novel device having non inflatable anatomical seal of the pharyngeal, laryngeal and peri-laryngeal structures.^{6,7} They have a passage for gastric tube insertion which can be used for gastric deflation and due to this advantage; use of these devices has been increased over a decade. Here, we have observed the ease of insertion, time taken to insert and post operatively occurring side effects of I-GEL.

INTRODUCTION

Supraglottic airway devices (SAD) have been the standard fixture in airway management.¹ It conveniently and effectively fills the bridge in securing airway between tracheal intubation and use of face mask. It has the advantage of being less traumatic and effortless insertion, without the necessity for laryngoscopy.² Laryngeal mask airway classic is a first generation supraglottic airway device, originally developed by Dr. Archie Brain in 1981.³ The introduction of laryngeal mask airway (LMA) marked landmark advancement in airway management.⁴ In 1996 LMA even gained entry into the American Society of Anaesthesiologists (ASA) difficult airway algorithm.⁵ First generation supraglottic airway devices provide little protection against gastric regurgitation and aspiration. Newer devices have incorporated designed

MATERIALS AND METHODS

A randomized, open label experimental study was conducted in 30 patients in Department of Anesthesia in MGM Hospital, Aurangabad over a period of two years from November 2016 to September 2018 after approval from ethical committee. Patients aged between 18-60 years with MPC (Mallampatti Classification) grade I and II and accepted under ASA grade I and II for elective surgeries under general anaesthesia were included in the study. Patients with MPC grade III and IV or mouth opening <2cm, history of URI or BMI >35kg/m² and any abnormality of the neck were excluded from the study. Materials used were I-GEL number 3 and 4, water based lubricant jelly and 12 Fr gastric tube. A written informed consent was obtained from all patients before including them in the study. Patients were kept NPO (nilper oral)

for 6 hours prior to surgery. All patients were advised Tablet *alprazolam* 0.5 mg and Tablet *Omeprazole* 40 mg or all night before surgery. The size of the device was decided based on patient's body weight and standard recommendation¹ I-gel- size 3:- for patients weighing between 30-50 kg, Size 4 :- for patients between 50-90kg. Intravenous (IV) Line was secured with angiocath number 20 gauge. All patients received Inj. *Glycopyrrolate* 0.005mg/kg IV, Inj. *Midazolam* 0.03mg/kg IV and Inj. *Fortwin* 0.5 mg/kg as premedication and preoperative baseline parameters like Pulse rate, Systolic Blood Pressure, diastolic blood pressure, Mean arterial pressure, SPO2 were noted. After 3 minutes of preoxygenation, General anaesthesia was induced by Inj. *Propofol* 2mg/kg. I-gel insertion was facilitated with Inj. *Suxamethonium* (2mg/kg IV). We waited for 45 seconds after giving i.v. *Suxamethonium*. A water based jelly was applied to I-gel. The anaesthesiologist inserted device from the head end of patient, while an assistant was opening jaw from the right hand side of the patient. We judged ease of insertion on the basis of number of insertion attempts. Number of insertion attempts was noted. When it was not possible to insert the device or ventilate through it, two more attempts of insertion were allowed. If placement was failed after three attempts, the procedure was abandoned and this case was considered as a failed attempt. Endotracheal intubation was performed and case was excluded from the study. Time of insertion was noted from the time the operator picked up I-gel till the ventilation was established. We clinically judged

adequate ventilation by chest rise and minimal leak. Hemodynamic responses (HR, SBP, DBP, MBP, SPO2) were recorded at the time of insertion of device i.e. 0 minute and then at 1, 3, 5, 10, 15, 20 minutes after insertion of I-gel. Anaesthesia was maintained with isoflurane in oxygen and nitrous oxide (50%-50%). *Atracurium* in a dose of 0.5mg/kg initial first dose and then 0.1 mg/kg for maintenance was given every 20min to maintain muscle relaxation. Adequate IV fluids were given in the form of crystalloids. Gastric tube of 12Fr was inserted through I-gel. Placement of gastric tube was confirmed by gastric content aspiration or by Woosh Test(8)(20ml air was pushed through gastric tube and a characteristic whooshing sound auscultated on epigastrium using diaphragm of stethoscope).

Grading of ease of insertion of gastric tube(10) (9)- We divided ease of gastric tube insertion in three grades.

- O Grade1= Easy,
- O Grade2=Difficult,
- O Grade3=Impossible.

After completion of surgery, stomach was emptied and nasogastric tube was removed. Residual neuromuscular blockade was reversed with inj. *Neostigmine* 0.005mg/kg+ inj. *Glycopyrrolate* 0.001mg/kg. I-gel were removed when patient was obeying verbal commands. Patient was oxygenated for 10minutes after removal of device. Any visible blood staining on the I-gel was noted at removal. The lip, tongue, teeth were inspected for evidence of trauma in the immediate post-operative period. Incidence of sore throat, hoarseness and dysphagia was noted after 24 hours of surgery.

Table 1: Age of patients

Age	I-Gel	
	No	Percentage
≤20 years	01	3.3%
21-30	05	16.7%
31-40	07	23.3%
41-50	09	30.0%
51-60	03	10.0%
>60	05	16.7%
Total	30	100%
Mean±SD	42.57±13.918	

Table 2: Gender of patients

Gender	I-Gel	
	No of Patients	Percentage
Male	29	96.67%
Female	01	3.33%
Total	30	100%

Table 3: ASA Grade of Patients

ASA Grade	I-gel	
	No of patient	Percentage
Grade 1	12	40.0%
Grade 1	18	60%
Total	30	100%

Table 4: Number of insertion attempts

Number of Insertion Attempts	I-Gel	
	No of Patients	Percentage
1	25	83.3
2	05	16.7
Total	30	100%

Table 5: Meantime taken for insertion (secs)

	I-gel Mean±SD
Time Taken for Insertion(seconds)	7.27±2.74

Table 6: Ease of insertion

Ease of Insertion of GastricTube	I-Gel	
	No of Patients	Percentage
Essay	22	73.3
Difficult	02	6.7
Impossible	06	20
Total	30	100%

Table 7: Adverse effects in patients

Adverse Effect	I-gel	
	No of Patients	Percentage
Sorethroat	03	10.0%
Tongue, Lip, Trauma	01	3.3%
None	26	86.7%
Total	30	100%

DISCUSSION

I-gel is a second generation supraglottic airway device. It has a passage for gastric tube insertion which can be used for gastric deflation. In our institute, we routinely use this device for surgeries under general anaesthesia and thus we have designed this study to observe insertion of I-gel. We selected 30 patients who were electively posted for surgery under general anaesthesia. Primary aim of our study was to observe I-gel for ease of insertion i.e. number of attempts, time taken for insertion, hemodynamic changes, ease of insertion of gastric tube and adverse events like regurgitation, aspiration, tongue, lip or dental trauma, post-operative sore throat.

- A. Number of insertion attempts:- In our study out of 30 patients, I-gel was inserted in first attempt in 25 (83.3%) patients, only 5 (16.7%) patient's required second attempt.

Sr.no	Studies	Insertion Success Attempts(%) In I to Failed			
		I	II	III	Failed
1	Theiler <i>et al</i> ³¹	93	7	0	0
2	Hyuk Kim <i>et al</i> ²⁹	98	2	0	0
3	Vikas Gupta <i>et al</i> ²⁶	96.67	3.33	0	0
4	W.H.L Teoh ²⁸	96	4	0	0
5	R.Ragazzi <i>et al</i> ²³	54	17	15	15
6	Our Study	83.3	16.7	0	0

B. Time taken for insertion:- Mean time taken for insertion of I-gel was 7.27 ± 2.74 seconds.

SR.NO	Studies	Mean time taken for insertion of I-GEL
1	Ashish Kannaujia <i>et al</i> ³⁰	11±10
2	Chew E.F.F. <i>et al</i> ²⁷	20±5
3	W.H.L. Teoh ²⁸	15.4
4	Theiler <i>et al</i> ³¹	42±23
5	HyukKimet <i>al</i> ²⁹	17.8±5.3
6	OURSTUDY	7.27±2.74

C. Ease of gastric tube insertion :- In our study we divided ease of gastric tube insertion in three grades. Grade 1= Easy, Grade 2=Difficult, Grade 3=Impossible. It was Easy (grade 1) in 73.3% patients, difficult (grade 2) in 6.7% patients and impossible to insert (grade 3) in 20% patients.

Ease of Insertion of Gastric Tube	Group I-gel	
	No	Percentage
Easy	22	73.3%
Difficult	02	6.7%
Impossible	06	20.0%
Total	30	100%

D. Adverse events:- Various complications of supraglottic airway devices are regurgitation, aspiration, trauma, dislodgement, post-operative sore throat, laryngospasm, nerve injuries, etc.

- Regurgitation / aspiration- There was not a single case of regurgitation or aspiration in our study. All patients were elective, kept nil by mouth for 6 hrs. This might have reduced the chances of regurgitation.
- Tongue / lip / dental trauma- In our study, only one patient in I-gel group had lip trauma.
- Postoperative sore throat- In our study, 3(10%) patients in I-gel group developed sore throat when observed 24 hrs after surgery.
- Hoarseness- We observed for hoarseness after 24 hrs of surgery. It was not recorded in any of the patients.
- Laryngospasm- We looked for perioperative laryngospasm (from induction till 30 mins after extubation). There was no incidence of laryngospasm in any patient.

CONCLUSION

The I-GEL takes barely 8 seconds for insertion, with non-significant post-operative adverse effects. I-GEL can be considered as preferred choice of airway for elective surgeries under general anaesthesia.

REFERENCES

1. Dorsch, Jerry A. anaesthesia equipments. understanding anaesthesia equipments. s.l. : 5th edition, page number 462, 2012.
2. The advantages of the LMA over the tracheal tube or facemask: a meta-analysis. J.,Brimacombe. 11, s.l. : Canadian Journal of Anaesthesia, 1995 Nov, Vol. 42. :1017-23..
3. Laryngeal Mask airway instruction. Brain A, Denman WT, Goudsouzian NG. San diago :s.n.
4. The Laryngeal Mask--an overview. Leach AB, Alexander CA. s.l. : European journal of anaesthesiology, 1991, Vol. 4. 19-31.
5. Laryngeal mask airway and the ASA difficult airway algorithm. Anaesthesiology. JL.,Benumof. (3), s.l. : The Journal of the American Society of Anaesthesiologists, 1996 Ma, Vol.84. :686-99.
6. The laryngeal mask: a new concept in airway management. AIJ., Brain. 55, s.l. : . Br JAnaesth, 1983. :801-805.
7. Initial anatomic investigations of the I-gel airway: A novel supraglottic airway without inflatable cuff. RM, 4.Levitan. 2005.
8. Nasogastric tube insertion in anesthetised, intubated adult patients:A comparison between three techniques. al, Mohanchandra Mandal et. s.l. : Indian Journal of Anesthesiology, 2018, Vol. 117.
9. Comparison of the LMA Supreme vs the i-gel in paralysed patients under going gynaecological laparoscopic surgery with controlled ventilation. al., 9.W. H. L. Teoh et. 65,2010. 1173-1179.
10. Crossover comparison of the laryngeal mask supreme and the i-gel in simulated difficult airway scenario in anesthetized patients. Theiler LG,Kleine-Bruegggeney M, Kaiser D, *et al.*2009, Vol. 111. 55-62.

Source of Support: None Declared
Conflict of Interest: None Declared