



CODEN [USA]: IAJPBB

ISSN : 2349-7750

INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187

<http://doi.org/10.5281/zenodo.4446759>
Available online at: <http://www.iajps.com>

Research Article

A COMPARATIVE STUDY BETWEEN TWO SUPRAGLOTTIC AIRWAY DEVICES: I GEL VS CLASSIC LARYNGEAL MASK AIRWAY

¹Aimen Sohrab Peerzada, ²Bilawal Nawaz, ³Saba Iqbal

¹Azad Jammu nd Kashmir Medical College

²Abbottabad International Medical Institute

³Gujrawanla Medical College

Article Received: October 2020

Accepted: November 2020

Published: December 2020

Abstract:

Objective: During general anesthesia, if there should arise an occurrence of grown-ups and youngsters, supraglottic airway route devices are acceptable substitute to making sure about airway route than tracheal intubation. This contextual analysis focused on examination between old style laryngeal cover airway route (LMA) and present day I-gel regarding sufficient position, simplicity of addition of device, keeping up of boundaries like ETCO₂ and SPO₂, intra usable and postoperative confusion perspective.

Study Design: Comparative Study

Place and Duration of Study: This study was conducted at the Department of Anaesthesia DHQ Teaching Hospital Gujranwala

Materials and Methods: There was choice of 120 patients in this randomized clinical preliminary from age went from 5 to 60 years of one or the other sex and from ASA evaluating went from I-III. These all patients were worked in recumbent situation under broad sedation. Sedation was instigated to every one of these patients in the wake of accepting premedication. Specialists that were utilized in sedation were fundamentally, inj. Succinylcholine 1.5-2mg/kg and inj. Propofol 2-3 mg/kg. Patient's airway route was made sure about with either old style LMA or I-gel in "sniffing air" position. The device position was observed by typical chest extension, by square wave capnography, nonattendance of discernible break and SPO₂ >95%. The patients were checked keeping in view the boundaries like number of endeavors, simplicity of inclusion, time used in addition, hemodynamic changes preoperatively and inconvenience included intraoperatively just as postoperatively.

Results: Statistically, no critical contrast was found in patients of both the Groups regarding BP, SPO₂ ETCO₂ and pulse, anyway it was seen that inclusion time was more noteworthy in Groups old style LMA when contrasted with bunch I-gel.

Conclusion: I-gel is viewed as better and great alternative substitution device to LMA as its inclusion is route simple, alongside negligible entanglements intraoperatively just as post operatively.

Key Words: I-gel, LMA, advantages, disadvantages.

Corresponding author:

Aimen Sohrab Peerzada,

Azad Jammu nd Kashmir Medical College

QR code



Please cite this article in press Nida Esa et al., A Comparative Study Between Two Supraglottic Airway Devices: I Gel Vs Classic Laryngeal Mask Airway., Indo Am. J. P. Sci, 2020; 07(12).

INTRODUCTION:

Endotracheal intubation was created by Mc Evan in 1880, which was an extraordinary development of past with respect to airway route the board. It was an incredible progressive creation that prompted the improvement of supraglottic airway route approach. The exceptionally proficient expertise and nonstop preparing is needed for appropriate tracheal intubation. In tracheal intubation, laryngoscopy is done straightforwardly that may prompt laryngopharyngeal sores. Tracheal intubation can cause hypertension, raise in plasma catecholamine, create reflex thoughtful incitement, ventricular arrhythmias lastly can cause intracranial hypertension.¹

Because of numerous hindrances of tracheal intubation, we can utilize device, for example, supraglottic airway route to keep up the airway route during sedation to youngsters and grown-ups. During the year 1981, laryngeal veil airway route (LMA) that was inflatable used.² Now daily, the cutting edge supraglottic airway route device I-gel is additionally accessible. The creation of I-gel comprises of straightforward delicate gel like material with non-inflatable sleeve.

The structure and plan of making of I gel is with the end goal that it makes anatomical non inflatable seals of structures, for example, perilaryngeal, pharyngeal and laryngeal tissue. There are various favorable circumstances of I-gel, for example, simpler inclusion, enduring strength, okay of pressure of tissues and low cost wise.³

The exemplary LMA has numerous disservices and it is substandard when contrasted with I-gel such that exemplary LMA has troublesome inclusion strategy, its taking care of is excessively intense, conceivable outcomes of tissue wounds, controlled ventilation and aspiratory goal hazard consistently there while utilizing c LMA.⁴

This contextual investigation was traditionally evolved to make correlations between both airway route devices specifically c LMA and I-gel. The total assessment, correlation and appraisal was done to decide for hemodynamic boundaries, intra usable and postoperative entanglements, addition inconveniences and capacity of the two devices to keep up ETCO₂ and SPO₂,

MATERIALS AND METHODS:

A randomized report was directed after taken endorsement from moral board of trustees to make examination between two airway route devices

specifically, traditional LMA and I-gel. In this examination, there was inclusion of 120 patients that can be either male or female, with age went from 6 to 65 years and weight differed from 10-75 kgs and ASA reviewing went from I, ii and iii going under broad sedation for their different surgeries.

The couple of patients were barred from study, for example, patients with pregnancy, full stomach, rest hernia, neurosurgery, crisis patients and patients that were marked with ASA grade iv.

The total preoperative appraisal of patients was done before the medical procedure. Both the devices, I-gel and c LMA were promptly accessible relying upon patient's weight. Patients who took an interest for this situation study were given infusions of ondansetron 0.15 mg/kg and glycopyrrolate 0.004 mg/kg preoperatively. Oxygen was given to patients for around 3 minutes as preoxygenation. All basic checking, for example, circulatory strain, beat rate, electrocardiogram and oxygen immersion were applied on all patients. Sedation enlistment was finished utilizing inj. succinylcholine 1.5-2 mg/kg and inj. propofol 2-3 mg/kg.

Subsequent to accomplishing required sedative state patients were situated in "sniffing air" position then the airway route was kept up utilizing I-gel or c LMA. So, on premise of which airway route device was utilized, we assembled patients in two classes named bunch I-gel and Groups c LMA. In Groups I-gel patients airway route was safeguarded utilizing I gel while in Groups c LMA, quiet airway route was saved utilizing c LMA. In Group I gel, gastric cylinder that was all around greased up was channelized by means of gastric channel into stomach

To check legitimate position of airway route device, we utilized boundaries like SPO₂ >95%, nonappearance of perceptible release, square wave capnography and typical development of chest.

There were not many explicit things that were seen that incorporate time taken for device inclusion, number of disappointments and endeavors to made device fix effectively, how easily device can be set complexities and troubles during expulsion n addition of device and hemodynamic changes.

Breathing circuit of sedation machine was connected to these airway route devices. The sedation of patients was accomplished utilizing half nitrous oxide, half oxygen, intravenous infusion of atracurium 0.5 mg/kg and isoflurane. Toward the finish of surgeries there

was inversion of neuro strong impeding specialist by utilization of inj. glycopyrrolate 0.08 mg/kg intravenously alongside the portion of inj. neostigmine 0.05 mg/kg. In the end airway route device was taken out subsequent to accomplishing sufficient flowing volume.

All the patients that went through a medical procedure were noticed for intricacies, for example, hypertension/hypotension, tachycardia/bradycardia, hypercarbia. After the activity the patients were analyzed for indications like hack, tongue deadness, breath holding, fit of larynx, dental wounds, lip wounds and presence of blood on devices.

Complete information examination were finished by utilizing unpaired t test was done and furthermore p esteem <0.05 was considered by utilizing the diagram cushion programming and after that dissected either critical or not.

RESULTS:

After the observation of complete data, we came to the conclusion that there was not any statistically significant difference between the two group regarding demographic data such as age, sex, weight, duration of surgery and ASA grading. This is shown in table 1.

Table No.1: Demographic data

Demographic Data		Group i-gel N=60 (%)	Group LMA N=60 (%)	P value
Age (years) Mean \pm SD		21.09 \pm 15.0	21.19 \pm 17.90	0.579
Sex(%):	Male	42(70%):18	45(75%):15	0.501
	Female	(30%)	(25%)	
Weight (Kg) Mean \pm SD		44.60 \pm 19.10	40.54 \pm 19.31	0.440
ASA: Grade(%)	ASA-I	09(15%)	09(15%)	0.667
	ASAI	40(66.6%)	45(75%)	
	ASA III	11(18.4%)	06(10%)	
Duration of Surgery (Minutes) Mean \pm SD		40.1 \pm 8.11	42.2 \pm 6.16	0.161

There was no difference regarding types of surgeries either by use of c LAM or i-gel (table 2).

In patients of the two groups, there was measurably critical distinction concerning endeavors for addition, endeavors in making inclusion, and time taken during addition for both c LMA and I-gel. Nonetheless, I-gel appeared to be better with deference than boundaries like simple inclusion and less endeavors required when contrasted with c LM. This correlation is appeared in table 3.

Table No.2: Types of surgery

Surgery	Group i-gel	Group LMA
	N=60(%)	N=60(%)
Contractor Release and STG	18(30%)	21(35%)
Diagnostic scopy	06(10%)	06(10%)
Circumcision and Hypospadiasis Repair	12(20%)	05(8.3%)
Excision biopsy for Fibroadenoma	06(10%)	09(15%)
I&D, Debridement, Resuturing	12(20%)	13(21.7%)
Fistulectomy, Haemorrhoidectomy	06(10%)	06(10%)

As far as parameters like hemodynamic were concerned, there was no statistically significant difference was seen in

patients of both groups using i- gel or c LMA as shown in figure 1 and 2.

Table No.3: Comparison between i-gel and LMA with respect to different parameters of insertion

Parameters of Insertion of device		Group i- gel N=60 (%)	Group LMA N=60 (%)	P value
Quality of Insertion	Easy	51(85%)	42(70%)	0.008
	Difficult	09(15%)	18(30%)	
Attempt of Insertion	First	54(90%)	38(63.4%)	0.005
	Second	05(8.4%)	12(20%)	
	Third	01(1.6%)	10(16.6%)	
Insertion Time (Seconds) Mean \pm SD		51.9 \pm 6.001	56.98 \pm 9.921	0.004
Manipulation	Gentle pushing	02(3.4%)	12(20%)	
	Chin lift	01(1.6%)	08(13.4%)	
During insertion		03(5%)	05(8.3%)	

Table No.4: Perioperative complications

Perioperative complications	Group i-gel	Group LMA
	No of Patients (%)	No of patients (%)
Difficulty in Removal	12 (20%)	30 (50%)
Post Extubation Cough	06 (10%)	18 (30%)
Numbness Of Tongue	03 (6%)	09 (15%)
Presence Of Blood On device	06 (10%)	10 (17%)

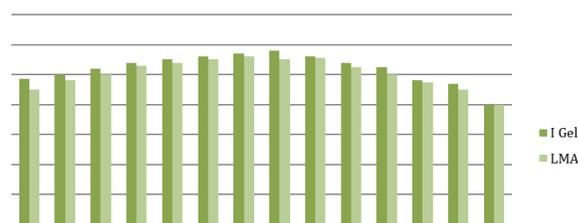


Figure No.1: Preoperative systolic and diastolic BP changes

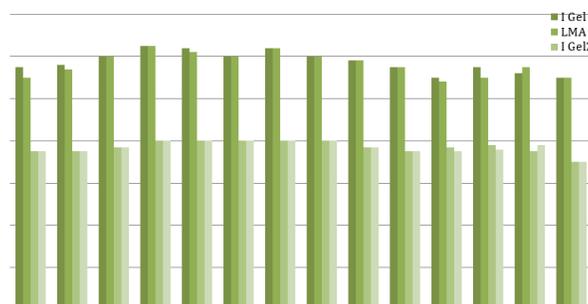


Figure No.2: Preoperative mean heart rate changes

In patients who were in c LMA group during surgery, post-operative complications like cough, difficulty in removal of device, blood on removed device and tongue numbness was witnessed in greater percentage as compare to i-gel as clearly demonstrated in table 4.

DISCUSSION:

Presently days, there are different supraglottic devices are available for keeping up patient's airway route during general sedation. Propositions supraglottic devices are far much better as analysed than regular endotracheal tubes.

There are various advantages of these supraglottic devices when contrasted with tracheal intubation, for example, simple addition, shirking of tachycardia, hypertension, better acknowledgment by patients, better hemodynamic boundaries security, less frequency of sore throat and hack. Besides, supraglottic devices fit straightforwardly over peripharyngeal seal to have wonderful fit. The supraglottic device c LMA, can be aimlessly placed into pharynx that structures seal of low weight around the larynx and consequently grant positive weight ventilation. c LMA grants sedative specialists inward breath with decline in airway route stimulation.⁴ I-gel is current revelation and better than c LMA as it were that it is non-inflatable supraglottic airway route device for keeping up respiratory airway route. While utilizing I-gel there is insignificant danger of injury of fringe tissues as it fits with patients airway route life systems completely.³ I-gel has tube that permits anaesthetists to approach gastrointestinal parcel with no danger of spewing forth and gastric inflation.⁵

In around 65 non-preserved corpses, Kinkle and Levitan chipped away at I-gel situating with the assistance of video laryngoscope, radiographs of necks particularly in parallel segment view and neck block dissection.⁶ They were astonished to find that that I-gel sits entirely over life systems of peri laryngeal despite the fact that it has no inflatable sleeve. In addition, it achieves legitimate situation as for supraglottic ventilation.

Lopez-Gil et al and Keller performed four unique tests to get to the oropharyngeal break pressure utilizing c LMA.⁷ The appraisal was done to test the perceptibility of commotion over auscultation on the parallel side of thyroid ligament, the discernibility of clamor over mouth, breathed out Co₂ identification by position of gas inspecting line inside oral pit lastly the evaluation of airway route during respiratory valve impede. These every one of the four-test help in an extraordinary manner in appraisal of hole

oropharyngeal pressure evaluation in little youngsters.

In some exploration, the situation of device made certain by Square wave capnography, chest developments, nonappearance of perceptible hole, thoracic stomach developments, absence of gastric insufflations on ventilation and break pressure >20 cm H₂O.⁸⁻¹³

In our ebb and flow research, the situation of airway route device was affirmed by boundaries like satisfactory chest developments, SPO₂ ≥95% and square wave capnography. The situation of device was done easily in 88% patients utilizing I-gel while 64% of the patients utilizing c LMA. The controls needed in situation of I gel was in 12% patients while in 36% patients utilizing c LMA. These controls incorporate jaw thirst and jaw lift. A few examinations done before in more established occasions demonstrated that arrangement of, I gel is considerably simpler when contrasted with c LMA.¹³⁻¹⁵

In numerous examinations while looking at addition of I-gel and c LMA, we came to realize that inclusion of I-gel was far simple when contrasted with c LMA in patients with neck contracture and just as in typical patients. Besides, comparative investigation was performed by Chauhan et al and Trivedi et al regarding addition of I-gel and c LMA and discovered comparative outcomes i.e I-gel was anything but difficult to inset when contrasted with c LMA.^{9,12,16,17} Moreover, Das et al did comparable examination and arrived at resolution that I-gel inclusion include less controls when contrasted with c LMA.¹⁸

In our flow research I-gel was put effectively in 85% patients while c LMA rate was 75%. In Group of patients that were given c LMA, about 12% of patient required second endeavour and 10% needed third. At the point when mean addition time was determined for I-gel and c LMA, it came out to be 51.9 ± 6.001 seconds and 56.98 ± 9.921 seconds, individually. Information gathered from both groups was considered statistically huge with respect to addition times ($p=0.0050$). Different investigations were accounted for by Chauhan et al that unmistakably announced that whether its I-gel or c LMA, practically the two devices took 3 endeavours for effective addition. At the point when mean addition time was

determined, I-gel indicated altogether brought down mean t inclusion time when contrasted with c LMA.12

Another specialist, Wharton et al tried and assessed the viability of I-gel in anesthetized patients and puppets and arrived at the resolution that I-gel can be effectively and easily embedded into patients airway route in both anesthetized and puppets even by unpracticed individual when contrasted with different alternatives of supraglottic airway routes available.5

A contextual analysis was performed by Jeon et al noticed the endeavors made for inclusion of c LMA and I-gel. They found that no factually critical contrast was seen as for first time addition of c LMA or I gel.11 Similarly, Das et al and Chen et al accomplished work on this and discovered comparable discoveries with respect to inclusion of I-gel and c LMA.18,19

In our present Study, various boundaries like diastolic circulatory strain, beat rate, ETCO₂ and SPO₂ were estimated and we arrived at resolution that there is no measurably critical contrast in patients of the two Groupss utilizing I-gel or c LMA and we determined p esteem >0.05. Chauhan et al, Helmy et al and Das et al accomplished comparative work in regards to I-gel or c LMA .one investigation was likewise performed by Trivedi et al and demonstrated that with the utilization in the event that I-gel there are less changes and adjustment in mean blood vessel pressure when contrasted with c LMA.12,15,17,18

Uppal et al investigated concerning make an examination between I-gel and endotracheal tube. On premise of this exploration, he found that there was expanded systolic and diastolic circulatory strain and pulse intraoperatively while utilizing endotracheal tube when contrasted with I-gel.8 In our ebb and flow research, we found that I-gel was easily eliminated in about 80% of cases when contrasted with c LMA, where easily evacuation rate was half. The confusions, for example, deadness of tongue, hacking after device expulsion, and recognizing a blood on device was higher if there should be an occurrence of c LMA when contrasted with I-gel.

We saw that with the utilization of c LMA, we experience intricacies like tongue deadness, dental injury, lip injury, minor disgorging, blood staining of device, GI side effects like queasiness, regurgitating, significant airway route block, sore throat and dysphagia ^{9,12,15,16,18,20}.

CONCLUSION:

The both airway devices c LMA and i-gel were able to

successfully maintain the airway of patients during anesthesia and can be tolerated well by all patients. i-gel is superior than c LMA in a way that its insertion is far easy as compare to c LMA. Secondly, there is less risk of airway damage by using i-gel as compared to c LMA. Thirdly, i-gel achieves ideal position for supraglottic ventilation, and fourthly it confirms to the perilaryngeal anatomy although there is no inflatable cuff as in c LMA. So in a nutshell, i-gel is superior and much better and excellent option in comparison to c LMA whenever supraglottic airway is used.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Benumof JL. Function of the aperture bars on the LMA. *Can J Anaesth* 2018; 50:968.
2. Al-Shaikh B, Pilcher D. Is there a need for the epiglottic bars in the laryngeal mask airway? *Can J Anaesth* 2018; 50:203.
3. Terblanche NCS, Middleton C, Choi-Lundberg DL, Skinner M. Efficacy of a new dual channel laryngeal mask airway, the LMA®Gastro™ Airway, for upper gastrointestinal endoscopy: a prospective observational study. *Br J Anaesth* 2018;120:353.
4. Miller DM. A proposed classification and scoring system for supraglottic sealing airways: a brief review. *Anesth Analg* 2014;99:1553.
5. Brimacombe J, Keller C. Laryngeal mask airway size selection in males and females: ease of insertion, oropharyngeal leak pressure, pharyngeal mucosal pressures and anatomical position. *Br J Anaesth* 2019;82:703.
6. Berry AM, Brimacombe JR, McManus KF, Goldblatt M. An evaluation of the factors influencing selection of the optimal size of laryngeal mask airway in normal adults. *Anaesthesia* 1998;53:565.
7. Asai T, Howell TK, Koga K, Morris S. Appropriate size and inflation of the laryngeal mask airway. *Br J Anaesth* 1998; 80:470.
8. Rao AS, Yew AE, Inbasegaran K. Optimal size selection of laryngeal mask airway in Malaysian female adult population. *Med J Malaysia* 2013;58:717.
9. Wender R, Goldman AJ. Awake insertion of the fiberoptic intubating LMA CTrach in three morbidly obese patients with potentially difficult airways. *Anaesthesia* 2017;62:948.
10. Seet E, Yousaf F, Gupta S, et al. Use of manometry for laryngeal mask airway reduces postoperative pharyngolaryngeal adverse events: a prospective, randomized trial. *Anesthesiol*

- 2010;112:652.
11. Liu EH, Goy RW, Lim Y, Chen FG. Success of tracheal intubation with intubating laryngeal mask airways: a randomized trial of the LMA Fastrach and LMA CTrach. *Anesthesiol* 2008;108:621.
 12. Vannucci A, Rossi IT, Prifti K, et al. Modifiable and Non-modifiable Factors Associated with Perioperative Failure of Extraglottic Airway Devices. *Anesth Analg* 2018;126:1959.
 13. Nakayama S, Osaka Y, Yamashita M. The rotational technique with a partially inflated laryngeal mask airway improves the ease of insertion in children. *Paediatr Anaesth* 2012; 12:416.
 14. Gupta D, Srirajakalidindi A, Habli N, Haber H. Ultrasound confirmation of laryngeal mask airway placement correlates with fiberoptic laryngoscope findings. *Middle East J Anaesthesiol* 2011;21:283.
 15. Devitt JH, Wenstone R, Noel AG, O'Donnell MP. The laryngeal mask airway and positive-pressure ventilation. *Anesthesiol* 1994; 80:550.
 16. Keller C, Sparr HJ, Luger TJ, Brimacombe J. Patient outcomes with positive pressure versus spontaneous ventilation in non-paralysed adults with the laryngeal mask. *Can J Anaesth* 1998; 45:564.
 17. von Goedecke A, Brimacombe J, Hörmann C, et al. Pressure support ventilation versus continuous positive airway pressure ventilation with the ProSeal laryngeal mask airway: a randomized crossover study of anesthetized pediatric patients. *Anesth Analg* 2005;100:357.
 18. Weiler N, Latorre F, Eberle B, et al. Respiratory mechanics, gastric insufflation pressure, and air leakage of the laryngeal mask airway. *Anesth Analg* 1997; 84:1025.
 19. Joly N, Poulin LP, Tanoubi I, et al. Randomized prospective trial comparing two supraglottic airway devices: i-gel™ and LMA-Supreme™ in paralyzed patients. *Can J Anaesth* 2014; 61:794.
 20. Seet E, Rajeev S, Firoz T, et al. Safety and efficacy of laryngeal mask airway Supreme versus laryngeal mask airway ProSeal: a randomized controlled trial. *Eur J Anaesthesiol* 2010;27:602.