MED-PHOENIX: JOURNAL OF NATIONAL MEDICAL COLLEGE

ORIGINAL ARTICLE

SUCCESS RATE OF INSERTION AND POSTOPERATIVE SORE THROAT:I-GEL VERSUS LARYNGEAL MASK AIRWAY CLASSIC

Pokhrel Prakriti,[1*] Parajuli Prastab [2]

[1] Tilganga Institute of Opthalmology, Kathmandu, Nepal
[2] B and B Hospital, Lalitpur, Nepal

Date of Submission : Jan 16, 2021
Date of Revision : Mar 29, 2021
Date of Acceptance : Apr 19, 2021
Date of Publication : July 19, 2021

Correspondence to:
Dr. Prakriti Pokhrel, MD
Department of Anaesthesia, Tilganga Institute of Opthalmology, Kathmandu, Nepal
Email: prakrity.p65@gmail.com

Citation:
Pokhrel P, Parajuli P. Success rate of insertion and postoperative sore throat:I-gel versus Laryngeal mask airway classic. Medphoenix. 2021;6(1):6-9

DOI:https://doi.org/10.3126/medphoenix.v6i1.34548

Conflict of interest: None, ***Funding:*** None

Publisher: *National Medical College Pvt. Ltd.*
MedPhoenix - Journal of National Medical College (JNMC); 2021,6(1), available at www.jnmc.com.np

ISSN:2631-1992 (Online); ISSN:2392-425X (Print)

ABSTRACT

Introduction: *Supraglottic devices are useful advent in airway management filling a gap between the facemask and tracheal tube. Laryngeal mask airway classic (LMA-C) is the first of its kind and I-gel is second generation non-inflatable one. The objective of our study was to compare the two supraglottic devices, laryngeal mask airway-classic and I-gel for a success rate of insertion and postoperative sore throat.*

Materials and Methods: *A total of 80 patients scheduled for elective surgery were studied in a prospective, randomized, comparative manner. They were allocated into two groups with forty in each group. After adequate anesthesia, the supraglottic devices of appropriate size were inserted. The success rate of insertion of the device was represented by the number of insertion attempts. In the postoperative ward patients were asked whether about sore throat, within 24 hours after surgery.*

Results: *There was a statistically difference between the two devices in terms of successful attempts of insertion. (p-value 0.02) In group I-gel, 34 out of 40 patients had first attempt insertion success, 6 patients in the second attempt. In group 2, first-time insertion success was in 14 patients, 23 patients in the second attempt, and 3 patients in the third attempt. The incidence of postoperative sore throat was higher in the LMA-C group than the I-gel group(17.5% vs 5% respectively) with a p-value of 0.154.*

Conclusion: *Compared to the laryngeal mask airway classic, I-gel was inserted with less number of attempts and had a lower incidence of postoperative sore throat.*

Keywords: *Laryngeal mask airway classic; I- gel, Sore throat; Supraglottic device*

INTRODUCTION

Supraglottic devices (SGD) are useful advent in the airway management filling a gap between the facemask and tracheal tube in terms of both anatomical position and the degree of invasiveness. They have been used safely and successfully in anaesthetic practice to maintain airway patency in day care short surgical procedures without the use of the neuromuscular blockade, in order to reduce the postoperative hospital stay and complaints of sore throat.[1]

Laryngeal Mask Airway (LMA) being first of its kind has now been established for airway management for more than three decades. Similarly, I-gel is a second generation non inflatable latex free supraglottic device made up of a thermoplastic elastomer. Its tip lies in the proximal opening of the oesophagus thus isolating oropharyngeal opening from laryngeal opening .The device has buccal stabiliser which has the propensity to adapt its shape to the oropharyngeal curvature. This houses airway tubing and separate gastric channel.[2,3]

The main aim of our study was to compare the two SGD's LMA classic and I-gel for success rate of insertion and post-operative sore throat.

MATERIALS AND METHODS

A cross sectional, comparative, prospective study was conducted in National Medical College and Teaching Hospital, Birgunj after approval from Institutional Review Board (IRB). All the patients undergoing elective surgery were included in the study. Total 80 patients of either sex, age range between 10-70 years with American Society of Anaesthesiology (ASA) physical status I and II, undergoing elective surgical procedures requiring general anaesthesia with spontaneous ventilation of less than one hour duration were enrolled in this study. Patients with recent history of sore throat or upper respiratory infection, history of gastroesophageal reflux, having

limited mouth opening, trismus, pharyngo-perilaryngeal abscess, trauma or mass were excluded from the study. Patients were randomised into 2 equal groups (I-gel group= 40, and LMA-C group= 40). Group 1 had I-Gel and Group 2 had LMA-classic as a device to be inserted.

Every patient's demographic parameters like age, sex and weight were recorded. Pre-anaesthetic assessment was done and 8 hours of fasting for solid food and 2 hours fasting for clear liquid was recommended for all the patients in order to prevent perioperative pulmonary aspiration. An hour prior to surgery, an intravenous access was established and slow infusion of crystalloids (Ringer's Lactate) was infused. Non-invasive monitors like 3-leads electrocardiogram, blood pressure, pulse oximetry were attached and baseline values of heart rate (HR), Blood pressure (BP), oxygen saturation (SpO_2) were recorded. Head was placed on soft pillow and preoxygenation done with 100% oxygen, and patients were induced with propofol (2-2.5 mg/kg) and Pentazocine (1 mg/kg). Depth of anaesthesia was confirmed by loss of eyelash reflex, easy up and down movement of lower jaw and no reaction to pressure applied to both angles of mandible.

After an adequate depth of anaesthesia was achieved, the allotted device was inserted in "sniffing morning air" position. Size selection of the I-gel or LMA-C was based on patient's weight which was in accordance with the manufacturer's guidelines. I –gel was grasped along the integral bite block and introduced into the mouth in the direction towards the hard palate and was glided downwards and backwards along the hard palate until definite resistance was felt. Similarly, the LMA-C was inserted followed by introduction of air into the cuff until a good seal was achieved.

Maximum three attempts were made for each group in order to insert the supraglottic airway device. In both the groups if first attempt insertion failed then, two more attempts were allowed. If placement failed after third attempt, the case was abandoned and the airway was maintained through different size of the same airway device or other airway device as suitable and case was excluded from the study. Once appropriately inserted placement of device was checked by gently squeezing the reservoir bag with the adjustable pressure limiting valve set to 10 cm water (H_2O) or by observing spontaneous reservoir bag movement with breathing. After securing the device successful airway placement was confirmed by bilateral symmetrical chest movement and square waveform on capnography. Maintenance of anaesthesia was done using oxygen and isoflurane 1% with spontaneous respiration. The depth of anesthesia was increased if needed by giving bolus dose of Propofol. The device was removed in spontaneously breathing patient under absence of any protective airway reflexes. In the postoperative ward, once the patient was fully conscious, they were questioned about sore throat (constant pain mild or severe, independent of swallowing which may or may not be accompanied by loss of voice, hoarseness or stridor) within 24 hours of surgery and was recorded in performa.

Data were analysed using SPSS software version 17 and by using Chi-square test or Fisher's exact variety of Chi-square test when the expected frequencies were less than 5 in at least one of the categories. Continuous data were presented as mean (± SD). Categorical data were presented as frequency. P value ≤ 0.05 was interpreted as statistically significant.

RESULTS

The demographic parameters age, sex, ASA physical status and weight of both the groups, is shown in Table 1.

I-gel was successfully inserted on first attempt in 34 (85%) patients and 6 (15%) of the patients in second attempt. On the other hand, LMA classic was successfully inserted in first attempts on only 14 (35%) patients. Most of the patients 23 (57.5%) had successful insertion on second attempt and it also required third attempt on few 3 (7.5%) patients, as shown in Table 2.

Comparison among the two devices revealed that for nearly 71% of the patients I-gel was successfully inserted in the first attempt compared to about 30% for LMA classic. None of the patients in the I-gel group required third attempt.

The Fisher's exact test based p-value was found to be highly statistically significant i.e. p< 0.001, which means that proportion of patients requiring number of attempts among I-gel and LMA-C groups are statistically different. This means that I-gel has high success rate of insertion than LMA classic.

Table 1: Age, Sex, ASA physical status and weight (Patient's demographic profile)

Variables		I-Gel(n=40)	LMA-C(n=40)	P value
Age (years)		26.7±14.5	30.6±18.5	P=0.318
Sex (Male:Female)		27:13	27:13	P=1.000
ASA physical status	I	39	32	P=0.029
	II	1	8	
Weight(Kgs)	<25	5	3	P=0.649
	25-49	14	17	
	>50	21	20	
		48.33±16.34	47.55±14.89	

Table 2: Numer of insertion attempts

Number of insertion attempts		Device inserted		Total	P Value
		I-Gel	LMA-C		
1	N	34	14	48	p=0.02
	%	85%	35%	60%	
2	N	6	23	29	
	%	15%	57.5%	36%	
3	N	0	3	3	
	%	0.0%	7.5%	38%	

The incidence of postoperative sore throat was 5% and 17.5% in I-gel group and LMA classic group respectively (p=0.154), as shown in Table 3.

Table 3: Incidence of post-operative sore throat

			Device Inserted		Total	P-value	OR(95% CI)
			I-Gel	LMA-C			
Post Op-erative Sore Throat	Present	N	2	7	9	P=0.154	4.0 (0.78-20.8)
		%	5.0%	17.5%	11%		
	Absent	N	38	33	71		
		%	95.0%	82.5%	89%		
Total		N	40	40	80		
		%	100.0%	100.0%	100.0%		

DISCUSSION

Advent of SGD's have filled the gap between jaw holding for prolonged periods, and intubation. The LMA Classic remains the simple alternative to face mask and intubation and I-gel has proved its worth clinically to be a safe SGD. Our study result of first attempt success and sore throat had been in accordance with previous studies comparing LMA-classic with I-gel.

Chauhan G et al.[4] did a prospective, randomised study in 80 patients. Ease and speed of insertions were primary outcomes measured, which with I-gel was found to be quick and easy than proseal LMA. Similar to our finding postoperative complications were also lower in I-gel group than laryngeal mask airway proseal group.

W.H.L Teoh et al.[5] compared the efficacy of the inflatable cuffed LMA-supreme against the non-inflatable I-gel. LMA Supremes and I-gels were successfully inserted on the first attempt, with similar ease, and comparable time. More patients in the LMA Supreme group experienced mild postoperative sore throat than I-Gel group. The finding of high first time insertion success and reduced incidence of sore throat in I-gel matched our study.

There was a similar study done by Singh I et al. [6] comparing I-gel and LMA-Proseal. They concluded that I-gel is easier to insert, requiring less attempts of insertion, has an easier gastric tube placement and is less traumatic as compared to LMA-ProSeal. The findings of which were also quite in accordance to our study.

Donaldson W et al. [7] found I-gel, and Aura once LMA were generally comparable with high overall and first-attempt success rates. The secondary outcome measured the incidence of sore throat which was lower in I-Gel group. The results being very much similar to our study regarding the success rate of insertion as well as incidence of sore throat.

Chandura RA et al. [8] in their interventional randomized study concluded that the I-gel was easy to insert with less airway manipulations, requiring less time and maintaining better hemodynamic stability following insertion and causing less post-operative complications compared to the LMA-classic. Also they suggested I-gel can be used as a better alternative to the LMA-C. This was another study which had similar finding to our study.

In our study I-gel was successfully inserted on first attempt. On the other hand, LMA was successfully inserted on second attempt on most of the patients and some even required third insertion attempt. In another study, more ease of insertion with I-gel was encountered than that with LMA-classic group. [9] Similar to this our study showed patients of I-gel group had successful first attempt insertion compared to LMA-classic. For a few of the I-gel patients it took second attempt compared to large number for LMA-classic. Devices with an inflatable mask have the potential to cause tissue distortion, venous compression, and nerve injury, which explains the increased incidence of associated postoperative morbidity

The incidence of postoperative sore throat in our study is less for I-gel group than LMA-classic group. A comparative study of I-gel versus the classic Laryngeal Mask found the group of patients where the I-gel was used present lower incidence of sore throat. [10]

There exists several limitations in our study. The study was conducted in a single. There were different airway morphology with this range of patient which may play confounding factor for success rate of insertion and incidence postoperative sore throat. Hence, the result cannot be extrapolated to certain groups of patients We did not compare the performance and complications with likely competitors like proseal LMA with I-gel or intubating LMA with I-gel. The observers collecting the data were not blinded so this may have introduced bias in the results.

CONCLUSION

Success rate of insertion of I-gel compared to LMA classic was found to be higher. Incidence of postoperative sore throat was more in LMA classic group compared to I-gel group.

REFERENCES

1. Mortensen CR, Jenstrup MT, Fruergard KO.nThe laryngeal mask: a new alternative to the facial mask and the endotracheal tube. Ugeskr Laeger. 1991;153:2542-4. 1991;153:2542-4. [Pubmed] [Full text]

2. Helmy AM, Atef HM, El-Taher EM, Henidak AM.Comparative study between I-Gel,a new supraglottic airway device and Classical laryngeal mask airway in anaesthetized spontaneously ventilated patients. Saudi J Anaesth. 2010;4:131-6. [DOI]

3. Jadhav PA, Dalvi NP, Tendolkar BA.I-gel versus laryngeal mask airway-Proseal:Comparision of two supraglottic airway devices in short surgical procedures. J Anaesthesiol Clin Pharmacol. 2015;31:221-5. [DOI]

4. Chauhan G, Nayar P, Seth A, Gupta K, Panwar M, Agrawal N. Comparison of clinical performance of the I-gel with LMA proseal. J Anaesthesiol Clin Pharmacol. 2013;29:56-60. [DOI]

5. Teoh WH, Lee KM,Suhitharam T,Yahaya Z,Teo MM,Sia AT.Comparison of the LMA Supreme vs the i-gel TM in paralysed patients undergoing gynaecological laparoscopic surgery with controlled ventilation. Anaesthesia. 2010;65:1173-9. [DOI]

6. Singh I, Gupta M, Tandon M. Comparison of Clinical Performance of I-Gel™ with LMA—Proseal™ in Elective Surgeries. Indian J Anaesth. 2009;5:302-5. [Pubmed] [Full Text]

7. Donaldson W, Abraham A, Deighan M, Michalek P. i-gel™ vs. AuraOnce™ laryngeal mask for general anaesthesia with controlled ventilation in paralyzed patients. Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub. 2011;155:155-63. [DOI]

8. Chandura RA, Kantharia BN, Shah PK. An Interventional Randomized study to Evaluate a new Supraglottic Device (I-Gel) in Comparision with the Classical LMA. Journal medical thesis 2013;1:17-9. [DOI] [Full Text]

9. Singh J,Yadav MK,Marhatta SB Shrestha Bl.Randomized crossover comparision of the Laryngeal mask airwayclassic with I-Gel in the management of difficult airway in postburn neck contracture patients. Indian J Anaesth. 2012;56:348-52. [DOI]

10. Sardi ASDC, Britto M, Rangel J. Comparision of postoperativesore throat and neck complaints after the use of I-gel vs traditional LMA. OJ Anes. 2013;3:233-6. [DOI]