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COMPARATIVE STUDY OF I-GEL VERSUS C-LMA-A SUPRAGLOTTIC DEVICE AMONG THE PATIENTS UNDERGOING SHORT SURGICAL PROCEDURES

Veena Arora	Professor, Department of Anesthesia, GSVM Medical College, Kanpur
Anurag Agarwal*	Associate Professor, Department of Anesthesia, *Corresponding Author
Rajiv Ratan Singh	Associate Professor, Departent of Emergency Medicine, Dr Ram Manohar Lohia Institute of Medical Sciences, Lucknow
Chandrashekhar singh	Associate Professor, Department of Anesthesia, GSVM Medical College, Kanpur
Manoj Kumar Upadhyaya	Associate Professor, Department of Anesthesia, GSVM Medical College, Kanpur
Shiv Shankar Tripathi	Associate Professor, Departent of Emergency Medicine, Dr Ram Manohar Lohia Institute of Medical Sciences, Lucknow

ABSTRACT **OBJECTIVE:** To compare I-gel versus C-LMA-A supraglottic deviceamong the patients undergoing short surgical procedures.

METHODS: Eighty patients of age between 20-50 years of ASA grade I and grade II who were posted for surgery under general anaesthesia were included in the study.Patients were randomly assigned into two groups: Group A: Classic LMA was used as the supraglottic device; Group B: I-GEL was used as the supraglottic device. All the patients were induced with thiopentone sodium and vecuronium as the muscle relaxant.

RESULTS: Insertion in first attempt was successful in 80% of patients in group B (I-GEL) as compared to 75% of Group A (C-LMA). There was a higher incidence of post-operative complications in group A than in Group B. Time required for insertion was 10.34±4.18 for group A and 8.52+5.54 seconds for Group B.

CONCLUSION: From our study, we conclude that I-gel is easier to insert when compared to C-LMA, takes less time for insertion, produces less postoperative complications and requires less number of attempts for successful insertion when compared to C-LMA.

KEYWORDS : Supraglottic device, Insertion, General anaesthesia

INTRODUCTION

Supraglottic airway devices (SGAs) have been shown to be suitable for use in routine anesthesia and emergency airway procedures (Timmermann, 2011). The I-gel airway (Intersurgical Ltd, Workingham., Berkshire, United Kingdom) and the ProSeal LMA (LMA-P) are second generation SGAs that were introduced in 2007 and 2000, respectively (Trivedi and Patil, 2011).

It has become something of a holy grail in recent years to maintain airway patency with supraglottic airway devices especially LMA-Proseal in day care short surgical procedures without the use of the neuromuscular blockade, in order to reduce the postoperative hospital stay and the postoperative complaints of sore throat (Brandt, 1987).

Following the overwhelming success of LMA since its invention in 1983,supraglottic airway devices are being developed in increasing frequency. They have got some potential advantages as compared to the intraglottic devices in that, they allow rapid access, doesn't require laryngoscope, relaxants not needed, provides favourable environment for spontaneous ventilation, tolerated at lighter anaesthetic planes, can be used as rescue airway and fibreoptic conduit in difficult intubation and also can be used for broncoscopy. But at the same time, they also have potential for tissue trauma, venous compression, nerve injury and aspiration of gastric contents.

I-gel is a novel supraglottic airway device with anatomically designed, non-inflatable mask, which is soft gel like and transparent made of medical grade thermoplastic elastomer called styrene ethylene butadiene styrene. The soft noninflatable cuff fits snugly onto the perilaryngeal framework and its tip lies in the proximal opening of the esophagus, thus isolating oropharyngeal opening from the laryngeal opening. The device has a buccal cavity stabilizer which has a propensity to adapt its shape to the oropharyngeal curvature of the patient. This buccal cavity stabilizer houses airway tubing and a separate gastric channel (Jadhav et al, 2015).

Since its introduction, various studies have taken place to compare it with other supraglottic devices like c-LMA, proseal LMA and also with the intraglottic devices. The present aimed in clarification of the queries regarding ease of insertion, time required for insertion and postoperative complications.

MATERIALS AND METHODS

The study was conducted in patients undergoing short surgical procedures of 30 minutes to two and half hours duration.

Selection of cases

Eighty patients of age between 20-50 years of ASA gradeI and grade II who were posted for surgery under general anaesthesia in L.L.R. and associated hospitals of G.S.V.M. Medical College, Kanpur, UP were selected for the study.

After getting approval from the hospital ethics committee written informed consent was taken from all the patients included in the study. Exclusion criteriawere patients with diminished pulmonary compliance with preexisting sore throat, ASA grade III and above, with mouth opening less than 2 fingers and distorted airway anatomy, patients with chances of aspiration e.g. those with full stomach, history of regurgitationand patients with BMI>30.

Study design: Eighty patients who were enrolled for study were randomly assigned into two groups:

Group A: Classic LMA was used as the supraglottic device.
Group B: I-GEL was used as the supraglottic device.

All the patients were induced with thiopentone sodium and vecuronium as the muscle relaxant.All patients were induced in the same manner with the same agents (no contraindication) to eliminate bias. Anaesthesia was maintained with N20 and 02 at ratio 60:40 and halothane 1.5%. Intraoperative analgesia was maintained with 100 mg tramadol. Patients were ventilated in volume control mode with tidal volume of 8ml/kg and PEEP of 3 cm of H20.Ease of insertion was divided into four categories qualitatively according to introducers interpretation-A. Easy B. Very easy C. Difficult and D. Very difficult. Not more than 2 attempts were taken with any of the device and after

two unsuccessful attempt, it was shifted to another device. According to the introducer's interpretation, a larger or smaller of the recommended size was used whenever seemed to be necessary after first unsuccessful attempt. Each patient was examined after the removal of the device for trauma in the form of bleeding, tissue injury and also 2 hours and 24 hours after removal for sore throat. The insertion time was noted i.e. the time starting from the full mouth opening to the successful fitting of the device.

Statistical analysis:

The results of continuous variables are given as mean±SD and proportion as percentage. The difference between the two groups was assessed by student's unpaired t-test for continuous variables and chi-square test wherever applicable. For all the tests a `p' value of 0.05 and less was considered for statistical significance.

RESULTS

The two groups did not differ significantly with respect to their age, sex, weight, height and ASA classification.There is no significant difference regarding ease of insertion (p>0.05) (Fig.1).

Insertion in first attempt was successful in 80% of patients in group B (I-GEL) as compared to 75% of Group A (C-LMA). 2 patients of group A and 1 patients of group B, the device placement wasunsuccessful after two attempts (Table-1).

There was a higher incidence of post-operative complications in group A than in Group B. In group A, 2 patients sustained trauma in the form of bleeding from the mucosa and 5 patients complained of sorethroat after 24 hrs whereas in Group B, 1 patient had trauma and 3 patients had sorethroat after 24 hours (Table-2). Time required for insertion was 10.34±4.18 for group A and 8.52+5.54 secs for Group B (Table not shown).

DISCUSSION

In this study,the insertion of I-Gel was found to be easy in 60% of the patients as compared to 50% that in c-LMA, very easy in 22.5% as compared to 17.5% in the counterpart. Only 17.5% cases the insertion was either difficult or very difficult whereas the data was 32.5% in c-LMA. There was no diversity of opinion among the studies regarding the superiority of I-gel in ease of insertion when compared to other supraglottic or intraglottic devices. Gupta et al (2008) proved its superiority over pLMA in the face of difficult intubation. Joshi et al (2008) found that I-gel was successful in securing the airway when it couldn't be secured in a patient of difficult airway with c-LMA and pLMA. Richez et al (2009), Jolliffe et al (2008), Nolan JP et al (2008), Singh et al (2009) and Kanaujia et al (2009) found similar results in their studies. But Janakiraman et al (2009) has kept c-LMA at a higher place than I-gel in ease of insertion.

In the present study, successful insertion at first attempt was higher with I-gel than that with c-LMA. In 80% of the patients, I-gel could be inserted successfully in 1st attempt,17.5% of the patients in 2nd attempt and in the rest 2.5% of the patients, insertion was unsuccessful after 2 attempts and was termed as failure. Kanaujiaet at (2009) found that insertion of I-gel was successful in 90% of the patients in the first attempt and none needed another attempt. Though most of the studies were in favor of our results, there were also studies to contradict it. Janakiramanet al (2009) found that the success rate for insertion at first attempt were significantly different (54% with I-gel Vs 86% with c-LMA).Overall success rate after two attempts when the size of the device was changed was 84% with I-gel Vs 92% with c-LMA.

In the present study, the postoperative complications were less with I-gel when compared to c-LMA.Almost all the studies published till now didn't contradict our findings.Keijzer et al (2009) in their study among 218 patients found that the incidence of sore throat was significantly lower with I-gel than with LM at 1 hour(6%vs 32%),24 hours (7%vs 48%) and 48 hours (5%vs 25%).Gatwardet al (2008) showed that the incidence of sore throat,airway irritation,oropharyngeal trauma and other complications were low with I-gel.This, it can be said strongly that postoperative complications related to the device are less with I-gel than that with other supraglottic devices.

The time required for insertion of I-gel (8.52 sec) was less than that for c-LMA (10.34 sec) though can't be said to be statistically insignificant (p>0.05) in this study.Time was counted from full mouth opening to successful fitting of the device. Wharton et al (2008) found that I-gel could be rapidly inserted in both manikins and patients by novice users. Gatward et al (2008) in their study among 100 patients found that the insertion of I-gel in correct position was rapid and easy. Teismier et al (2010)found that sufficient ventilation could be achieved 50% faster through I-gel when compared to c-LMA and LT.

CONCLUSION

From our study, we conclude that I-gel is easier to insert when compared to C-LMA, takes less time for insertion, produces less postoperative complications and requires less number of attempts for successful insertion when compared to C-LMA.

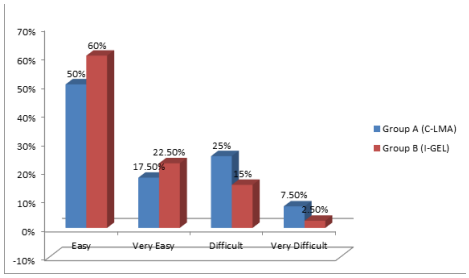

Fig. 1: Comparison of Ease of Insertionbetween the groups

Table-1: Comparison of no. of Attempts

	Group A (C-LMA) (n-40)	Group B (I-GEL) (n-40)
Insertion in 1st Attempt	30(75%)	32(80%)
Insertion 2nd Attempt	8(20%)	7(17.5%)

Table–2: Comparison of postoperative complications related to the device

	Group A C-LMA	Group B I-GEL
Trauma	2	1
Sore Throat after 2 hours	5	2
Sore throat after 24 hours	5	3

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