Original Article

Insertion Time of the 1-Gel and LMA-C in Adult Patients under Anesthesia: A Comparison

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ABSTRACT

Objective: To evaluate the time required for the insertion of I-gel and LMA-C in adult patients under general anesthesia.

Study Design: Randomized Control Trial

Place and Duration of Study: This study was conducted at the Anesthesia department DHQ Teaching hospital Sahiwal, from December 2016 to May 2017.

Materials and Methods: A total of 166 Patients of either sex, meeting the inclusion criteria enrolled from outpatient department. All the patients were randomly divided into two equal groups, group A and group B with 83 patients in each group. In group A. patients laryngeal mask airway was administered and inflatable cuff was inflated to 60 cm H_2O. Similarly in group B. I-gel was administered.Mean and standard deviation was calculated for qualitative variables while frequency and percentage was calculated for quantitative variables. Chi square test was applied and P value less than and equal to 0.05 was considered as significant.

Results: Gender distribution was as follows; 56.6% males in group A and 55.4% males in group B while 43.4% females in group A and 44.6% females in group B. Mean and standard deviation of age in group A and B was 38.58+1.01 and 38.71+1.13 respectively. Mean insertion time was 30.76+0.71 in group B and 34.16+0.74 in group A.

Conclusion: I-gel has significantly shorter average insertion time as compared to LMA Classic.

Key Words: Laryngeal mask airway, Anesthetized, I-GEL response, good laryngeal seal and offering similar clinical performance

INTRODUCTION

Supraglotic airway devices are in common use for airway management in emergency and for daily life anesthesia[1]. These devices are considered as advancement in the field of airway management. Advantage of supraglotic airway devices include less traumatic, easier in placement and have a role in airway protection thus making them as important devices for emergency and routine airway management[2]. A number of supraglotic airways devices are in use currently for the airway management[3].

In outpatient and elective procedures the laryngeal mask airway classic is used as supraglotic device[4]. Classic laryngeal mask airway is used in patients who are breathing spontaneously or in patients with assisted or controlled ventilation.

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In some emergent cases such as in neonatal or adult resuscitation and difficult airways laryngeal mask airway classic has been reportedly used successfully[5]. Laryngeal mask airway classic has clinical usability with less presser response and excellent laryngeal seal and has similar clinical performance. I-gel is a disposable device without inflatable cuff[6]. It is made of transparent and soft gel like thermoplastic elastomer and is latex free. It is designed in such a way that it can fit to the anatomical structures of perilaryngeal and hypopharyngeal even without the inflatable cuff. It also contains a port through which gastric tube can be passed[7]. Among the advantages of I-gel protection against aspiration, securing the airway when cardiopulmonary resuscitation is performed and protections against unanticipated difficulty in intubation. Moreover it easier to insert and is associated with lesser tissue compression[8].

In a study where laryngeal mask airway was compared to I-gel in terms of success rate among 60 patients suggested that laryngeal mask airway classic was more successful (95%) as compared to I-gel (93%) with P value=1.100[9]. laryngeal mask airway classic use required less time for insertion also. As there are no local studies present regarding the comparison of these supraglotic devices in terms of ease of insertion of I-gel

and laryngeal mask airway. Therefore in this study we are going to compare the I gel with laryngeal mask airway classic in order to assess the efficacy of the two devices and measure the time required for insertion of these supraglotic airway devices in patients under anesthesia for airway management. This will help in evaluation of the efficacy of the better device and will help in making recommendations as if to what device has easier insertion and can be used in future management of airway.

MATERIALS AND METHODS

It is a randomized control trail held in anesthesia department of District Headquarter Teaching Hospital Sahiwal from 1st December 2016 to 1st May 2017. A total of 166 patients took part in the study. Ethical approval was obtained from Hospital Ethics Committee and informed consent was taken from each patient. Patients belonging to ASA physical status of class I-II, belonging to either sex, aged in the range of 20 to 60 years, undergoing elective surgery in Nishtar Hospital Multan and requiring tracheal intubation were included in the study. Enrollment was based upon the inclusion criteria. Sample size was calculated from the reference study (9). All the patients were randomly divided into two equal groups, group A and group B with 83 patients in each group. In group A. patients laryngeal mask airway was administered and inflatable cuff was inflated to 60 cm H_2O. Similarly in group B. I-gel was administered. Optimal Jefferson's position was obtained by placing the patients in supine position and putting a 7 cm high pillow under their head. Propofol and O2\NO2 mixture was used to maintain the anesthesia. All the data was collected and measured by the researcher himself and data was recorded in the form of a performed performa. Computer software SPSS version 23 was used for statistical analysis of the data thus collected. Mean and standard deviation was calculated for qualitative variables while frequency and percentage was calculated for quantitative variables. Chi square test was applied and P value less than and equal to 0.05 was considered as significant.

RESULTS

Among the 166 patients who took part in this study, 83 were placed randomly in group A and 83 in group B. Group A was administered with laryngeal airway mask classic while group b was administered with i-gel. Gender distribution was as follows; 56.6% males in group A and 55.4% males in group B while 43.4% females in group A and 44.6% females in group B. Mean and standard deviation of age in group A and B was 38.58+1.01 and 38.71+1.13 respectively. Time interval of anesthesia of less than half hour was found in 90.4% of patients in group A while in 88.0% of patients in group B. Similarly duration was 1\2 hour in 9.6% of patients in group A while 12.0% in group B.

Age distribution among the two groups is shown in Table I.

Different procedures for which laryngeal airway mask classic or I-gel was used have been shown in Table II. Mean and standard deviation of insertion time in group A was 34.16+0.74 while it was 30.76+0.71 in group B. Chi square test was applied to compare the insertion time required for the two supraglotic airway devices and significant difference was found between the two groups where I-gel was associated with shorter period required for its insertion (p=0.001).

Table No.I: Age Distribution of Patients

Age (years)	group A	group B
20-29	8(9/6%)	18(22.6%)
30-39	44(53%)	32(38.6%)
40-49	19(22.9%)	19(22.9%)
50-59	12(14.5%)	14(16.9%)
Total	83(100%)	83(100%)

Table No.2:Type of procedure for which airway inserted

Procedure	No. of Patients in Group A	No. of patients in Group B
Burn Dressing	13(15.7%)	6(7.2%)
Cervical Cerclage	2(2.4%)	2(2.4%)
Dilatation and Curettage	12(14.5)	13(15.7%)
Examination under Anesthesia	20(24.1%)	32(38.6%)
Fibro adenoma	4(4.8%)	6(7.2%)
Incision and drainage	18(21.7)	20(24.1%)
Manipulation under anesthesia	8(9.6%)	2(2.4%)
Wound debridement	6(7.2%)	2(2.4%)
Total	83(100%)	83(100%)

Table No.3:Descriptive Statistics

Variables	Group A (Mean±S.D)	Group B (Mean±S.D)
Age	18.58±1.01	38.71±1.13
Height	161.78±1.13	160.81±1.13
Weight	61.06±1.14	60.81±1.13
Insertion time	34.16±0.74	30.76±0.76

DISCUSSION

In the current study comparison between the two commonly used supraglotic devices has been done i.e. laryngeal mask airway classic and I-gel. Comparison is based upon the time required for the insertion of each device in patients in need of airway management under anesthesia. I-gel is a novel airway device which is latex

free and it is disposable without inflatable cuff[10]. I-gel has been designed in a way that it creates separate paths for gastrointestinal tract and respiratory tract and carries a port through which gastric tube can be introduced[11]. Some past studies have shown its efficient use for airway management for difficult intubation and resuscitation[12]. Few other studies similar to the current study have been done in which I-gel has been compared to laryngeal mask airway classic[13-15]. Parameters of hemodynamic stability were similar in both groups such as heart rate and blood pressure. No statistically significant difference was reported by Jindal et al[16] which is in accord to the results of our study.

Insertion rate of I-gel has been reported previously in a study conducted by Richez et al (17) was 97%. They also reported that insertion of I-gel was very easy to perform and was successfully administered in all patients in first attempt. In another study performed by Accot et al[18] where efficacy of I-gel was assessed during general anesthesia and the results were almost similar to ours suggesting that only one attempt is required by the I-gel to get introduced in patients under general anesthesia and that duration of insertion was less than ten seconds in all cases. Similar conclusion was made by Gatward et al[19].

In a study by Levitan et al[10] mechanics and positioning of I-gel were studied in cadavers. They concluded that I-gel can be easily administered and can adjust to perilaryngeal anatomy despite the fact that it is devoid of inflatable cuff. Moreover ventilation was properly functioning due to sufficient positioning of the I-gel.

I-gel is superior to laryngeal mask airway in terms of safe use during cardiopulmonary resuscitation. The reason behind this advantage is the non availability of the inflatable cuff. It contains a gastric inlet and separates the gastrointestinal and respiratory tracts and prevents probable complications of gastric inflation, aspiration and regurgitation. In current study the two supraglotic devices were placed within two attempts and only simple manual maneuvers were required for their insertion[20]. Postoperative complications are the most significantfactors to be compared between the two supraglotic airway devices. But in our study the no statistically significant difference between I-gel and laryngeal mask airway classic in terms of postoperative complications. Only nausea and vomiting were the postoperative complications which were relatively higher in patients with laryngeal mask airway classic owing to the gastric insufflation. Previous literature also provides the evidence in favor of the results of this study as no major complications are associated with the use of I-gel. Aspiration is protected in I-gel and laryngeal mask airway almost equally. Sore throat, sore tongue, temporary hoarseness and hyperesthesia of tongue are few minor complications that might occur with the use of supraglotic airway devices[17].

In study conducted by Accot et al[18] no case with the evidence of blood stained airway device (I-gel) after its removal was reported. This result is similar to the results of our study. Moreover they reported that incidence of trauma to airway during the insertion of I-gel was very low. These findings are similar to the findings in our study. On the other hand leak pressure was significantly more among the patients who had undergone the insertion of I-gel as compared to the patients in which laryngeal mask airway was introduced. This depicts the more efficient sealing pressure with use of I-gel because it has the capability to adapt to the anatomy of supraglotic region. In this study gastric tube insertion through gastric outlet in the I-gel was 95% successful and these stats are almost similar to those reported by Richez et al[17] as they reported the success rate to be 100%. By this mechanism I-gel prevents gastric insufflation and helps in decreasing the postoperative complications such as vomiting and nausea.

As far as the risk associated with laryngeal mask airway classic is concerned incomplete mask seal that results in oropharyngeal air leakage or gastric insufflation. In contrast to the findings of our study a previous study reported that I-gel was inferior to laryngeal mask airway in terms of providing better seal of esophagus[21]. On the contrary, Weiler et al[22] reported that laryngeal mask airway classic was associated with higher incidence of gastric insufflation.

CONCLUSION

I-gel is superior to laryngeal mask airway classic in terms of average insertion time. However no significant difference was found between the two supraglotic airway devices in regard to any alteration in hemodynamic status or postoperative complications.

Author's Contribution:

Concept & Design of Study:	Muhammad Shahid
Drafting:	Muzamil Hussain
Data Analysis:	Muhammad Omer Ajmal
Revisiting Critically:	Muhammad Shahid, Muzamil Hussain
Final Approval of version:	Muhammad Shahid

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

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