

Comparing the Success Rate and Post Operative Complications Following the Use of I-Gel and Air-Q Supraglottic Airway Device; an Observational Study

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Abstract

Background: The aim of the study is to compare I-gel and Air-Q supraglottic airways in terms of time required for insertion, ease of device insertion, no. of attempts taken and incidence of complications.

Methods: This randomised observational study was conducted on 60 patients, age of 20-60 years, elective surgery requiring general anaesthesia. Patients were randomly allocated in two groups. Group I: I-gel (no=30); Group II: Air-Q (no=30). Under adequate depth of anaesthesia appropriate size I-gel or Air-Q was inserted and the parameters were noted. For statistical analysis, student t-test was employed to compare the means and chi-square test was used for categorical variables. Complications were compared using Fisher's exact test.

Results: Both groups of patients were demographically similar. In all patients supraglottic airway device was inserted within two attempts. Mean insertion time in first attempt for I-gel (14.57 ± 2.1 sec) was found to be significantly lower than Air-Q (24.97 ± 4.2 sec) ($P=0.003$).

Conclusion: We conclude that I-gel is easier and safer than Air-Q during general anaesthesia.

Keywords: I-gel, Air-Q, Supraglottic airway

MANUSCRIPT;

I. Introduction

Traditionally face mask and endotracheal tubes are the important tools for airway maintenance. It needs experience to master the art of endotracheal intubation.^[1] After the advent of supraglottic airway devices (SAD), securing an airway is relatively easy and less time consuming.^[2] I-gel (intersurgical, Wokingham, UK) and Air-Q supra glottic airway (Mercury medical, Clearwater, FL, USA) are the two important SADs which are being used routinely as an airway conduit and also to aid intubation.^{[3][4]} In this study we compare the performance of I-gel and Air-Q supra glottic airway in terms of success rate of insertion and postoperative complications in patients undergoing elective surgeries requiring general anaesthesia.

II. Materials And Methods

After getting approval from the institutional ethics committee, this observational study was conducted on 60 ASA I & II patients of either sex undergoing elective surgery requiring general anaesthesia with controlled ventilation. ASA III & IV patients, obesity (BMI >30), restricted mouth opening, hiatus hernia, pregnancy, GERD, emergency surgical patients were excluded from the study. Patients were divided into two groups comprising Group I; I-gel (no=30), Group II; Air-Q supra glottic airway device (no=30). A thorough preoperative assessment and airway assessment were made before giving anaesthesia. Informed consent was obtained from all patients. In the OT, after connecting the monitors (HR, BP, SPO₂, ECG and ETCO₂), an IV line was started in the non dominant hand. Patients were premedicated with inj. glycopyrrolate 0.2 mg (i.v), inj. midazolam 0.02 mg/kg, (i.v) and inj. fentanyl 2 µg/kg (i.v). Following premedication patients were preoxygenated with 100% oxygen for three minutes. Anaesthesia was induced with propofol 2 mg/kg, atracurium 0.5 mg/kg and mask ventilation was continued for 3 minutes with 100% oxygen. After getting adequate relaxation appropriate size SADs were used to secure the airway according to the manufacturer's recommendation. Successful insertion of the device was confirmed by chest wall movement and square wave capnographic tracing.

All the attempts were done by an experienced anaesthetist with at least three years experience. Time interval was noted from putting the SAD in to the mouth, till getting adequate chest rise without any airleak. If first attempt is inadequate, a second attempt is made to secure the airway. If the second attempt is inadequate, we consider it as a failed one and resort to endotracheal intubation. At the end of surgery, airway devices were

inspected for blood staining and we made a thorough examination of oral cavity. All cases were followed up for twenty four hours in post.op ward to detect any untoward incidents.. All parameters were recorded and analysed by proper statistical tests.

III. Results

Two groups were statistically similar in relation to age ,sex,weight.[Table1] Demographic profile.

Variables	I-gel(no=30)	Air-q(no=30)	P-value
Age in yrs	31.12±11.66	32.41±7.25	0.867
Sex(m/f)	18/12	16/14	0.632
Weight(kg)	54.2±8.67	52.15±8.63	0.612

Table 2- Ease of insertion

Group	Easy	Difficult	P Value
IGEL	27(90.0%)	3(10%)	.02
AIR-Q	25(83.3%)	5(16.7%)	Significant

Table 2 shows that by using I- gel 90% of cases were inserted easily as against 83.3% for Air-Q supraglottic airway device which is statistically significant(p=0.02).

Table 3 shows that by using I- gel 93.3% cases were done in the first attempt and 6.7% of cases in the second attempt as against 83.3% and 16.7% for Air-Q,respectively

Table 3; No.of attempts

Group	1 attempt	2 attempt	P Value
IGEL	28(93.3%)	2(6.7%)	.228
AIR-Q	25(83.3%)	5(16.7%)	Not significant

Table 4 shows the duration attempt in seconds which is less for I- gel(14.57 secs) as against 24.97 seconds for Air-Q which is statistically significant(p=0.003).

Table4;Duration of attempt.

Group	N	Mean±SD	P Value
IGEL	30	14.57±2.1	.003
AIR-Q	30	24.97±4.2	Significant

6.7% of cases of I-gel had blood staining after removal while 26.7% cases had blood staining with the use of Air-Q. 3.3% of cases had developed sorethroat by using I-gel as against 13.3% for Air-Q. None of the patients got into major complications like bronchospasm,laryngospasm and change in voice.

TABLE 5: Complications

COMPLICATIONS	IGEL		AIR-Q		P Value
	YES	NO	YES	NO	
Sore throat	1 (3.3%)	29 (96.7%)	4 (13.3%)	26 (86.7%)	.161 Not significant
Bronchospasm	0	30(100%)	0	30(100%)	30(100%)
Laryngospasm	0	30(100%)	0	30(100%)	30(100%)
Traumatic injury	0	30(100%)	0	30(100%)	30(100%)
Hoarseness of voice	0	30(100%)	0	30(100%)	30(100%)
Blood staining	2(6.7%)	28(93.3%)	8(26.7%)	22(73.3%)	0.038 Significant

IV. Discussion

In the above study , we compared the success rate of SAD insertion and postoperative complications while using I-gel and Air-Q supra glottic airway device. . The ease of insertion for I-gel was easy in 90% of cases and 10% had a difficult insertion as against 83.3% and 10% respectively for Air-Q which was statistically significant..Bhandari et al^[5] in his study comparing I-gel and Air-Q , the first attempt success rate was 80% for I-gel and 62.5% for Air-Q. We had a better results because all our attempts were done by experienced anaesthetists. Similar results have been observed by HelmyAM et al^[6] in their study comparing I-gel and classic LMA.Mean duration of attempt was 15.6±4.9 seconds in the I-gel group while it was 26.2±17.7 seconds in the LMA group which is statistically significant(P=0.0023).There is no significant changes in the vital parameters during the procedure. No.of insertion attempts were statistically insignificant between the study groups(p> 0.05).Richez Bet et al^[7] had a 93% success rate while using I-gel which was consistent with our results. Min-soo Kim et al^[8] in their study on children pointed that insertion of I-gel was significantly easier compared to the Air-QSP(0.04).While Donaldsen et al^[9] had a similar success rate for I-gel..

Rayhan et al^[10] in their observation, insertion time for I-gel was significantly shorter than the LMA classic group (11.6±2.45 secs versus 13.1±1.8 secs) [p=0.001]. In a systematic review and meta analysis by Park et al^[11], I-gel had a shorter insertion time and lower incidence of blood staining on the device. In our study, time required for SAD insertion was less in I-gel group which was statistically significant. In I-gel group insertion time was 14.57±2.11 seconds and in Air-Q group it was 24.97±4.2 seconds, which was similar to the study of Halwagi et al^[12] who achieved first attempt insertion time of 29±16 seconds in ILMA group and 19±8 seconds in I-gel group.

Based on these observations, we infer that I-gel effectively conforms to the perilaryngeal anatomy despite the lack of an inflatable cuff and produce less sympathetic response^[13]. Devices with an inflatable mask have the potential to cause tissue distortion, venous compression, and nerve injury which explains the increased incidence of associated post operative morbidity^[14,15]. Trauma on insertion, multiple insertions, pressure exerted by cuff against the pharyngeal mucosa, cuff volumes, and cuff pressure have all been incriminated for postoperative complications^[16].

V. Conclusion

I-gel is better than Air-Q in securing patient airway during general anaesthesia. I-gel is better in terms of ease of insertion, less time for insertion and lower incidence of morbidity. I-gel requires less manipulation, no cuff inflation, so securing airway is rapid in most instances. We did not compare intubation through these devices. For elective surgeries which require SAD insertion, we recommend I-gel as a preferred one.

References

- [1]. Sinha PK, Misra S. Supraglottic airway devices other than laryngeal mask airway and its prototypes; Indian J. Anaesth. 2005;49(4);281-292.
- [2]. Ramesh S, Jayanthi R. Supraglottic airway devices in children; Indian J Anaesth. 2011;55(5);476-482.
- [3]. Jindal P, Rizvi A, Sharma JP. Is I-gel a new revolution among supraglottic airway device. M.E.J Anesth 2009;20;53-58.
- [4]. Halwagi AE, Massicotte N, Lallo A, Gauthier A, Boudreault, Monique Ruel et al. Tracheal intubation Through the I-gel supraglottic Airway versus the LMA Fastrach. A Randomised Controlled Trial. Anesth Analg 2012;1;152-6.
- [5]. Geetha Bhandari, Subhro.shahi, K.S. A comparative study evaluating I-gel and Air-Q LMA for ventilation in anaesthetised and paralysed patients. Ann. of Intl. Med & Den. Res. 2015;1(1);25-8.
- [6]. Amr M, Helmy, Hussain M, Atef, Ezzat M, El-Taher; Comparative study between I-gel, a new supra glottic airway device and classical laryngeal mask airway in anaesthetised spontaneously ventilated patients; Saudi j anaesth 2010 sep-dec ;4(3);131-136.
- [7]. Richez B, Saheif L, Bancheraur, Torrielli, Cros AM; A New single use supra glottis airway device with a non inflatable cuff and an esophageal vent. An observational study of I-gel; Anaesth Analg; 2008;106(4);1137-9.
- [8]. Min-soo Kim, Jae Hoon Lee, Sang Won Han; A randomized comparison of the I-gel with the self pressurised Air-Q ILA in children; Paediatric Anaesthesia 2015;25(4);405-12.
- [9]. Donaldson W, Abraham A, Deigha M, Michaelak; I-gel vs Aura once laryngeal mask for general anaesthesia with controlled ventilation in paralysed patients; Biomed Pap Med Fac Univ, Palacky, Olomouc, Czech; 2011; june; 155(2);155-63.
- [10]. Reyhan Polat, Gozde Bumin Aydin, Julide Ergil; Comparison of I-gel and Laryngeal mask airway Classic in terms of clinical performance; Rev. Bras. Anesthesiol; 2015;65;343-8.
- [11]. Park SK, Choi GJ, Choi YS, Ahn EJ, Kung H; Comparison of the I-gel and the LMA proSeal during general anaesthesia; A systematic review and meta analysis. 2015; PLoS ONE; 10(3) :e0119469.
- [12]. Halwagi AE, Massicotte N, Lallo A, Gauthier A, Boudreault, Monique Ruel et al. Tracheal intubation Through the I-gel supraglottic Airway versus the LMA Fastrach. A Randomised Controlled Trial. Anesth Analg 2012;1;152-6.
- [13]. Levitan RM, Kinkle WC. Initial anatomic investigations of the I-gel airway; A novel supraglottic airway without inflatable cuff. Anaesthesia 2005;60;1022-6.
- [14]. Gardy DM, McHardy F, Wong J, Jin F, Tong D, Chung F. Pharyngolaryngeal morbidity with laryngeal mask airway in spontaneously breathing patients. Anaesthesiology 2001;94;760-6.
- [15]. Nott MR, Noble PD, Pamar M. Reducing the incidence of sore throat with laryngeal mask airway. Euro J Anaesthesiol 1998;15;153-7.
- [16]. Siddiqui, Races US, Siddiqui SZ, Heider S, Raza SA; Comparison of performance and safety of I-gel with laryngeal mask airway for general anaesthesia with controlled ventilation; Anaesth pain and intensive care; 2010; 14(1);17-20.