ORIGINAL ARTICLE

Comparison of Outcome of Laryngeal Mask Airway (LMA Classic) and I-Gel Devices in Patients Undergoing General Anaesthesia in Elective Surgeries

SHAHID RASOOL DAR, RIAZ HUSSAIN, TAHIR NAZEER, *AMNA TAHIR*

ABSTRACT

Background: Supraglottic airway devices (SADs) have been used widely since 1990s. All supraglottic airway devices are designed to form a seal in the pharynx between the respiratory and digestive tract to protect the airway and facilitate gas exchange.
Aim: To compare the safety of Laryngeal mask airway (LMA classic) and I-gel devices, regarding blood on removal of devices and post-operative nausea and vomiting.
Methods: This was a randomized controlled trial. Total 200 patients undergoing elective surgical procedure were included and divided into two equal groups A and B by using random number table. Each group comprised of 100 patients. In group A LMA and in group B I-gel was used. Following, preoxygenation with 100% oxygen, patients were induced with propofol 2.5mg/Kg, nalbuphine 0.1mg/Kg and atracurium 0.5 mg/Kg IV to insert device. Standard II monitoring was applied to all patients. Anaesthesia was maintained with 50% N_2O in O_2 and Isoflurane at 1.2 MAC. At the end of surgery neuromuscular blockade was reversed with neostigmine and atropine. Devices were removed and monitored the patients in recovery room for 24 hours. All data was entered and analyzed by SPSS version 11. Chi square test was applied. P-value of ≤ 0.05 was considered significant.
Conclusion: I-gel is found to be more advantageous.
Keywords: General Anaesthesia, Airway management, Laryngeal mask airway, I-gel.

INTRODUCTION

The tracheal intubation is the gold standard method for maintaining a patent airway during anaesthesia[1]. However this maneuver requires skill and continuous training, practice and direct laryngoscopy which may cause laryngopharyngeal lesion[2]. Laryngoscopy is an important factor in the hemodynamic stress response associated with tracheal intubation[3,4]. Attempts to minimize the presser response to laryngoscopy and intubation are being made by using alternative devices such as supraglottic airway devices[5]. Supraglottic airway devices (SADs) have been used widely since 1990s[6,7]. All supraglottic airway devices are designed to form a seal in the pharynx between the respiratory and digestive tract to protect the airway and facilitate gas exchange[8]. The LMA has been well established for more than a decade and is often used when endotracheal intubation is not necessarily required[9]. The LMA is also tolerated at lighter level of anaesthesia than endotracheal tube[10]. The incidence of postoperative sore throat is also significantly less in patients receiving LMA[11]. Nevertheless simple handling of the LMA is limited by the potential risk of aspiration because fiber optic studies have found 6-9% visualization of the esophagus via the LMA[12,13,14]. In recent years the "I-gel", another SAD with some more features has been designed that set it apart from other competitors. I-gel is a new SAD without an inflatable cuff and design for use during anaesthesia[15].

The I-gel has a gastric channel allowing venting of the air and gastric contents or insertion of gastric tube[16]. I-gel facilitates the passage of an orogastric tube for decompression of stomach[17-19]. I-gel has improved airway seal pressure with lower mucosal pressure[8,20].

MATERIAL AND METHOD

After approval of study from the hospital ethical committee 200 patients undergoing elective surgical procedure in general anaesthesia were included, written informed consent from each patient was taken and divided them into two equal groups A (LMA) and B (I-gel) by using by using a random number table. Each group comprised of 100 patients. Following preoxygenation with 100% O_2, patients were induced with propofol 2.5mg/kg slowly, nalbuphine 0.1mg/Kg and Atracurium 0.5mg/Kg intravenous. Standard II monitoring was done. Anaesthesia was maintained with 50% N_2O and isoflurane at 1.2% MAC. At the end of surgery neuromuscular blockade was reversed with neostigmine and atropine and devices

Department of Anaesthesia, Services Hospital, Lahore
Correspondence to: Dr. Tahir Nazeer, Email: drtahirnazeer@yahoo.com

were removed and monitored the patients in recovery room for 24 hours. All date was entered and analyzed by SPSS version 11. Chi square test was applied P-value of ≤ 0.05 was considered significant. This was a randomized controlled trial and sampling technique was non-probability purposive sampling. Sample size of 200 cases was calculated with 80% power of test and 5% level of significance.

RESULTS

According to results of this study mean age was 41.87±3.76 year (Table 1). 57% in group A and 53% in group B were male and 53% in group B were male and 43% in group A and 47% in group B were females (Table 2).

Table 1: Age distribution (n = 200)

Age (years)	Group A	Group B
18-30	23(23%)	27(27%)
31-40	37(37%)	31(31%)
41-50	40(40%)	42(42%)

Mean±SD: 41.87±3.76

Table 2: Gender distribution (n = 200)

Gender	Group A	Group B
Male	57(57%)	53(53%)
Female	43(43%)	47(47%)

Table 3: Comparison of blood on device in both groups (n=200)

Blood on device	Group A	Group B
Yes	23(23%)	2(2%)
No	77(77%)	98(98%)

P value = 0.00

Table 4: Comparison of Nausea & Vomiting in both groups

Nausea & vomiting	Group A	Group B
Yes	27(27%)	8(8%)
No	73(73%)	92(92%)

P value = 0.00

Table 5: Stratification for blood on device in both groups with regards to age (n = 25)

Age (years)	Group A	Group B
18-30	0	4(17.39%)
31-40	1(50%)	9(39.13%)
41-50	1(50%)	10(43.48%)

Table 6: Stratification for blood on device in both groups with regards to age (n = 25)

Gender	Group A	Group B
Male	0	5(21.74%)
Female	2(100%)	18(78.26%)

Table 7: Stratification for Nausea & Vomiting in both groups with regards to age (n = 35)

Age (years)	Group A (n=27)	Group B (n=8)
18-30	5(18.52%)	2(25%)
31-40	9(33.33%)	3(37.5%)
41-50	13(48.15%)	3(37.5%)

Table 8: Stratification for Nausea & Vomiting in both groups with regards to gender (n = 35)

Gender	Group A	Group B
Male	12(44.44%)	3(37.5%)
Female	15(55.56%)	5(62.5%)

Comparison of blood on device in both groups was recorded as 23(23%) in group A and 2(2%) in group B while 77(77%) in group A and 98(98%) had no blood on device, P value was calculated as 0.00 (significant) Table 3.

Comparison of nausea and vomiting in both groups shows 27(27%) in group A and 8(8%) in group B, P value was 0.00 (significant) Table 4.

DISCUSSION

The management of the airway has come a long way since the development of endotracheal intubation by Macewen in 1880 to the present day usage of so sophisticated devices[21]. In this clinical trial we studied the outcome of LMA classic and I-gel devices in patients undergoing general anaesthesia and found that I-gel was more advantageous. The findings of the study of siddique AS et al also support our study, who represents a significant efficacy of I-gel as compare to LMA for induction of general anaesthesia by showing 0% in I-gel group and 18% in LMA group[3]. Similarly the study of Helmy M and Hassam M also support our study and they recorded nausea and vomiting in 5% with I-gel group and 20% in LMA group[22].

In the study of Richez B et al they found that insertion success rate was 97%[23]. In the study of Acott CJ he assessed the use of I-gel as an airway device during general anaesthesia[24]. Similarly Gatward JJ et al evaluated size-4 I-gel airway in 100 non-paralyzed patients and found that first insertion attempt was successful in 86% of patients, the second attempt in 11% of patients and third attempt in 3% of patients[25].

CONCLUSION

We concluded that there is a significant difference in outcome of LMA and I-gel devices in patients undergoing general anaesthesia in elective surgeries and I-gel is found to be more advantageous.

REFERENCES

1. The European Resuscitation Council (ERC) and the American Heart Association (AHA) in collaboration with the International Liaison Committee on Resuscitation (ILCOR): International Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiac Care. Resuscitation. 2000; 6:29-71.

2. Peppard SB, Dickens JH. Laryngeal Injury following short-term intubation. Ann Otol Rhinol Laryngol. 1983; 92: 327-30.
3. Saddiqui AS, Raees US, Siddiqui SZ, Haider S, Raza SA. Comparison of performance and safety of I-gel with laryngeal mask airway (classic) for general anaesthesia with controlled ventilation. Anaesth Pain & intensive care 2010; 14(1):17-20.
4. Richez B, Saltel L, Banchereau F, Torrielli R, Cros AM. A new single use suprglottic airway device with a noninflatable cuff and an esophageal vent: an observational study of the I-gel., Anesth Analg 2008; 106:1137-9.
5. Levitan RM, Kinkle WC. Initial anatomic Investigations of the I-gel airway; a novel supraglottic airway without inflatable cuff, Anaesth 2005; 60: 1022-6.
6. Sharma S, Scott S, Rogers R, Popat M. The I-gel airway for ventilation and rescue intubation. Anaesthesia 2007; 62:419-20.
7. Gatward JJ, Cook TM, Seller C. Evaluation of the size 4 I-gel trade mark airway in one hundred non-paralyzed patients. Anaesthesia 2008; 63: 1124-30.
8. Van Zundert A, Brimacombe J, Kamphuls R, Haanschoten M. The anatomical position of three extraglottic airway devices in patients with clear airways. Anaesthesia 2006; 61:891-5.
9. Weiler N, Latorre F, Eberie B, Goedecke R, Heinrichs W. Respiratory mechanics, gastric insufflation pressure, and air leakage of the laryngeal mask airway. Anesth Analg. 1997;84:1025-8.
10. Barash PG, Cullen BF, Stoelting RK, Cahalan M, Stock MC. Airway management. Clinical Anaesthesia 6th ed. Philadelphia, USA: Lippincott Williams & Wilkins 2009;602-5.
11. Hohlrieder M, Brimacombe J, von Goedecke A. Postoperative nausea, vomiting, airway morbidity, and analgesic requirements are lower for the ProSeal laryngeal mask airway than the tracheal tube in females undergoing breast and gynaecological surgery. Br J Anaesth 2007; 99(4):576-80.
12. Barker P, Langton JA, Murphy PJ, Rowbotham DJ. Regurgitation of gastric contents during general anaesthesia using the laryngeal mask airway. Br J Anaesth. 1992;69;358-60.
13. Payne J. The use of the fibreoptic laryngoscope to confirm the position of the laryngeal mask. Anaesthesia. 1989;44:865.
14. Morgan EG, Maged MS. In: Clinical anesthesiology. 4th ed. USA: McGraw-Hill Companies; 2006. Airway management; P.65.
15. Levitan RM, Kinkle WC. Initial anatomic Investigations of the I-gel airway; A novel supraglottic airway without inflatable cuff. Anaesthesia. 2005;60:1022-6.
16. Michalek P, Hodgkinson P, Donaldson W. Fibreoptic intubation through an I-gel supraglottic airway in two patients with predicted difficult airway and intellectual disability. Anesth Analg. 2008;106:1501-4.
17. Uppal V, Fletcher G, Kinsella J. Comparison of the I-gel with the cuffed tracheal tube during pressure-controlled ventilation. Br J Anaesth 2009; 102:264-8.
18. Bamgbade OA, Macnab WR, Khalaf WM. Evaluation of the I-gel airway in 300 patients. Euro J Anaesth 2008;25:865-6.
19. Morgan E, Maged S. Mikhail, Micheal J. Murray. Airway management. Clinical anesthesiology:2006;97-111.
20. Gatward JJ, Thomas MJ, Nolan JP, Cook TM. Effect of chest compressions on the time taken to insert airway devices in a maniking. Br J Anaesth 2008;100:351-6.
21. James CD. Sir William Macewen and anaesthesia. Anaesthesia. 1974;29:743-53.
22. Helmy AM, Hassam M. Comparative study between I-gel, a new supraglottic airway device, and classic laryngeal mask airway in anesthetized spontaneously ventilated patients. Saudi J Anaesth 2010;4:131-6.
23. Richez B, Saltel L, Banchereau F. A new single use supraglottic device with a noninflatable cuff and an esophageal vent: An observational study of the I-gel. Anesth Analg. 2008;106:1137-9.
24. Acott CJ. Extraglottic airway devices for use in diving medicine – part 3: The I-gel. Diving Hyperbaric Med. 2008;38:124-7.
25. Gatward JJ, Cook T, Seller C, Handel J. Evaluation of the size 4 I-gel airway in one hundred non-paralyzed patients. Anesthesia. 2008;10:1365-9.