

Comparison of ProSeal Laryngeal Mask Airway & Supreme Laryngeal Mask Airway as Ventilatory Devices

Keshav Dev Jagar¹, Lokesh Kumar Gupta²

¹Assistant Professor, Department Of Anaesthesiology, Saraswathi Institute Of Medical Sciences, Hapur, Uttar Pradesh, India 245304, ²Associate Professor, Department Of Anaesthesiology, Saraswathi Institute Of Medical Sciences, Hapur, Uttar Pradesh, India 245304.

Abstract

Background: The present study was conducted to compare ProSeal-Laryngeal Mask Airway and Supreme laryngeal mask airway (SLMA) in patients. **Subjects and Methods:** The present study was conducted on 40 patients of both genders. Patients were divided into 2 groups of 20 each. Group I patients were given supreme laryngeal mask airway and group II were given ProSeal laryngeal mask airway. All the devices were checked, prepared, inserted and secured. **Results:** The number of attempt in group I and II was 1, insertion time was 16.4 seconds in group I and 21.5 seconds in group II. Duration of anesthesia in group I was 71.8 minutes and in group II was 71.2 minutes, duration of pneumoperitoneum in group I was 62.4 minutes and 62.8 minutes in group II. Insertion time NG tube in group I was 10.2 seconds and in group II was 8.4. The difference was significant ($P < 0.05$). In group I, OLP1 was 29.2 cm H₂O and in group II was 34.8, OLP2 in group I was 27.9 and in group II was 33.2, OLP3 in group I was 28.5 and in group II was 34.9. The difference was significant ($P < 0.05$). **Conclusion:** ProSeal laryngeal mask airway better as compared to supreme laryngeal mask airway.

Keywords: ProSeal laryngeal mask airway, pneumoperitoneum, Supreme laryngeal.

Corresponding Author: Dr. Lokesh Kumar Gupta, Associate Professor, Department of Anaesthesiology, Saraswathi Institute Of Medical Sciences, Hapur, Uttar Pradesh, India 245304.

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Introduction

Supraglottic airway devices are currently the most commonly used instruments in airway management.^[1] Some of the newer supraglottic airway devices have been modified to improve sealing and have separate respiratory and gastrointestinal tracts. One of the most popular types of airway devices is the ProSeal-Laryngeal Mask Airway (P-LMA) device.^[2] Another is the Supreme Laryngeal Mask Airway (S-LMA) device which was introduced in 2007. The S-LMA, a disposable airway device, consists of the features of P-LMA, Fastrach LMA and Unique LMA, with its own gastric drainage channel, fixed curve tube, and maneuvering handle.^[3]

Supraglottic airways (SGAs) offer distinct advantages including an increased speed and ease of placement, maintenance of hemodynamic stability during induction and emergence, better oxygenation during emergence and lesser postoperative sore throat and voice alteration.^[4] ProSeal LMA is used 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. ProSeal laryngeal mask airway (PLMA) is a reusable SGA with a modified cuff made of silicone and a double tube arrangement. The Supreme laryngeal mask airway (SLMA) is an advanced form of the PLMA made of polyvinylchloride (PVC).^[5] The present

study was conducted to compare ProSeal-Laryngeal Mask Airway and Supreme laryngeal mask airway (SLMA) in patients.

Subjects and Methods

The present study was conducted in the department of Anesthesiology. It comprised of 40 patients of both genders. Written consent was obtained prior to the study. The study protocol was approved from institutional ethical committee. Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 20 each. Group I patients were given supreme laryngeal mask airway and group II were given ProSeal laryngeal mask airway. All the devices were checked, prepared, inserted and secured. In both groups, insertion times, number of insertion attempts, drainage tube insertion attempts, ease of insertion of airway device and gastric tube, oropharyngeal leak pressure (OLP) and pharyngolaryngeal morbidity were assessed. Three measurements of OLP were taken: OLP1 (after successful insertion of SGA), OLP2 (10 minutes later) and OLP3 (at tend of surgery). Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Distribution of patients

Total- 40		
Groups	Group I (SLMA)	Group II (PLMA)
Number	20	20

[Table 1] shows that group I patients were given Supreme laryngeal mask airway (SLMA) and group II were given ProSeal laryngeal mask airway (PLMA). Each group comprised of 20 patients each.

Table 2: Demographic characteristics

Characteristics	Group I (SLMA)	Group II (PLMA)
Weight (Kgs)	56.2	52.3
Height (cms)	155.6	157.2
ASA grade	I	16
	II	4
Type of surgery		
Laparoscopic cholecystectomy	12	14
Open hernioplasty	4	3
Tubal ligation	3	2
Skin grafting	1	1

[Table 2] shows that mean weight of patients in group I was 56.2 Kgs and in group II was 52.3 Kgs, height was 155.6 cms in group I and 157.2 cms in group II, ASA grade was I seen in 17 in group I and 16 in group II, grade II was 3 in group I and 4 in group II. Type of surgery was laparoscopic cholecystectomy seen 12 in group I and 14 in group II, open hernioplasty seen 4 in group I and 3 in group II, tubal ligation seen 3 in group I and 2 in group II, skin grafting seen 1 in both groups.

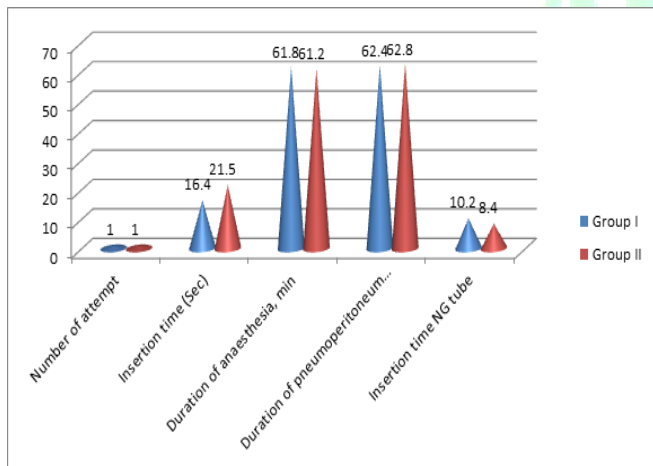


Figure 1: Comparison of parameters

[Figure 1] shows that number of attempt in group I and II was 1, insertion time was 16.4 seconds in group I and 21.5 seconds in group II. Duration of anaesthesia in group I was 71.8 minutes and in group II was 71.2 minutes, duration of pneumoperitoneum in group I was 62.4 minutes and 62.8 minutes in group II. Insertion time NG tube in group I was 10.2 seconds and in group II was 8.4. The difference was significant (P< 0.05).

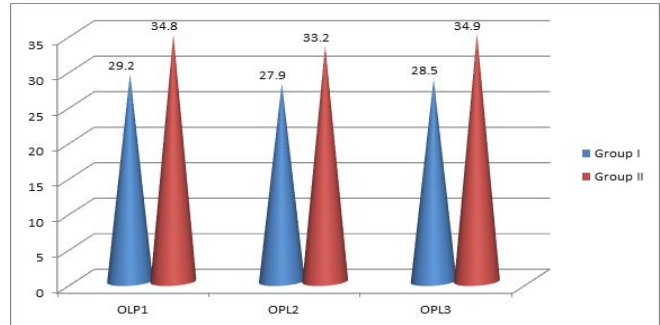


Figure 2: Determination of Oropharyngeal leak pressure

[Figure 2] shows that in group I (cm H2O), OLP1 was 29.2 and in group II was 34.8, OLP2 in group I was 27.9 and in group II was 33.2, OLP3 in group I was 28.5 and in group II was 34.9. The difference was significant (P< 0.05).

Discussion

The SLMA and the ProSeal laryngeal mask airway (PLMA) are equally effective for airway management, in patients breathing spontaneously during general anesthesia of short duration. The minimal hypercapnia that occurred with both SADs was within the acceptable values during spontaneous ventilation. The Laryngeal Mask Airway (LMA) is a supraglottic airway device (SAD) designed to maintain a patent airway, which sits outside of and creates a seal around the larynx.^[6] It is relatively non-invasive as compared to endotracheal intubation and in scenarios where endotracheal intubation is not mandatory, LMA has emerged as a formidable choice over endotracheal intubation. Ease of insertion is defined as no resistance to the insertion of device in the pharynx in single attempt. LMA-Proseal is a complex device requiring an introducer for insertion.^[7] The present study was conducted to compare Proseal-Laryngeal Mask Airway and Supreme laryngeal mask airway (SLMA) in patients.

In present study, group I patients were given Supreme laryngeal mask airway (SLMA) and group II were given ProSeal laryngeal mask airway (PLMA). Each group comprised of 20 patients each. Van Zundert et al,^[8] report that the increased OLP values with S-LMA are associated with the increase of intracuff pressures. Yet another study asserts that with the S-LMA, higher leak pressures are obtained at high intracuff pressures. On the contrary, despite the increased intracuff pressures during surgery, OLP did not increase in our previous study. While the silicone cuff of the P-LMA is permeable and intracuff pressure can increase when nitrous oxide is used, the cuff of the S-LMA is made of polyvinyl chloride is less elastic and less permeable to nitrous oxide.

We found that number of attempt in group I and II was 1, insertion time was 16.4 seconds in group I and 21.5 seconds in group II. Duration of anaesthesia in group I was 71.8 minutes and in group II was 71.2 minutes, duration of pneumoperitoneum in group I was 62.4 minutes and 62.8 minutes in group II. Insertion time NG tube in group I was 10.2 seconds and in group II was 8.4.

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Zhang et al,^[9] compared the safety and efficacy of the Supreme Laryngeal Mask Airway (S-LMA) with that of the ProSeal-LMA (P-LMA) in laparoscopic cholecystectomy. Sixty adults were randomly allocated. Following anaesthesia induction, experienced LMA users inserted the airway devices. Oropharyngeal leak pressure was similar in groups (S-LMA, 27.8±2.9 cmH₂O; P-LMA, 27.0±4.7 cmH₂O; p=0.42) and did not change during the induction of and throughout pneumoperitoneum. The first attempt success rates were 93% with both S-LMA and P-LMA. Mean airway device insertion time was significantly shorter with S-LMA than with P-LMA (12.5±4.1 seconds versus 15.6±6.0 seconds). The first attempt success rates for the drainage tube insertion were similar (P-LMA, 93%; S-LMA 100%); however, drainage tubes were inserted more quickly with S-LMA than with P-LMA (9.0±3.2 seconds versus 14.7±6.6 seconds). In the PACU, vomiting was observed in five patients (three females and two males) in the S-LMA group and in one female patient in the P-LMA group.

Conclusion

Authors found ProSeal laryngeal mask airway better as compared to supreme laryngeal mask airway.

References

1. Eschertzhuber S, Brimacombe J, Hohlrieder M, Keller C. The Laryngeal Mask Airway Supreme—A single use laryngeal mask airway with an oesophageal vent. A randomised, cross-over study with the Laryngeal Mask Airway ProSeal in paralysed, anaesthetised patients. *Anaesthesia* 2009;64:79- 83.
2. Bamgbade OA, Macnab WR, Khalaf WM. Evaluation of the I- gel airway in 300 patients. *Eur J Anaesthesiol* 2008;25:865- 6.
3. Jadhav PA, Dalvi NP, Tendolkar BA. I-gel versus laryngeal mask airway-Proseal: Comparison of two supraglottic airway devices in short surgical procedures. *J Anaesthesiol Clin Pharmacol* 2015;31:221-5.
4. Lu PP, Brimacombe J, Yang C, Shyr M. ProSeal versus the Classic laryngeal mask airway for positive pressure ventilation during laparoscopic cholecystectomy. *Br J Anaesth* 2002;88:824-7.
5. Singh A, Bhalotra AR, Anand R. A comparative evaluation of ProSeal laryngeal mask airway, I-gel and Supreme laryngeal mask airway in adult patients undergoing elective surgery: A randomised trial. *Indian J Anaesth* 2018;62:858-64.
6. Keller C, Brimacombe JR, Keller K, Morris R. Comparison of four methods for assessing airway sealing pressure with the laryngeal mask airway in adult patients. *Br J Anaesth*. 1999;82:286-7.
7. Gaitini LA, Vaida SJ, Somri M, Yanovski B, Ben-David B, Hagberg CA. A randomized controlled trial comparing the ProSeal Laryngeal Mask Airway with the Laryngeal Tube Suction in mechanically ventilated patients. *Anesthesiology*. 2004;101:316-20.
8. Van Zundert AA, Wyssusek K. Postoperative sore throat – Know where your airway is positioned. *Anaesthesia*. 2016;71:1241-2.
9. Zhang L, Seet E, Mehta V, Subramanyam R, Ankichetty SP, Wong DT, et al. Oropharyngeal leak pressure with the laryngeal mask airway Supreme™ at different intracuff pressures: a randomized controlled trial. *Can J Anaesth*. 2011;58:624-9.

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