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ORIGINAL ARTICLE

Comparison of Outcome of Proseal Laryngeal Mask Airway and Supreme Laryngeal Mask Airway in Patients Undergoing Surgery Under General Anaesthesia

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ABSTRACT

Objective: To compare the proseal laryngeal mask airway's performance to that of the supreme laryngeal mask airway in patients undergoing surgery under general anesthesia.
Study design: Descriptive-Comparative Study
Settings: Department of Anesthesia, Jinnah Postgraduate Medical Centre Karachi
Study duration: December 2020 to June 2021
Materials & Methods: It was estimated that 154 patients of both genders were considering elective surgery while under the effect of general anesthesia. They were between the ages of 18 and 60. Patients were not allowed to participate in the trial if they had trouble breathing, were known to have lung or heart problems, were at danger of aspiration, or had a fractured neck spine. Following the acquisition of informed permission, the selected cases were then randomly separated into two groups, one labelled group P and the other designated group S. Group P patients were given a proseal laryngeal mask, which is a form of airway. A supreme laryngeal mask was used by those in Group S. During the first twenty-four hours, the researcher checked on each patient to see if they were coughing or had sore throats.
Results: More than 96% of patients with Proseal and 88% of patients with Supreme-LMA were able to successfully insert the device on their first try in our study. When it came to inserting patients, the S-LMA group performed better than the others (19.17 2.69 min vs. 23.16 1.73 min). When comparing the adverse effects of Proseal-LMA and Supreme-LMA, we found that 27.27 Vs 20.78 percent reported cough, 18.18 Vs 12.99 percent blood stains, and 20.78 Vs 3.90 percent painful throat respectively.
Conclusion: The results of this study show that the supreme laryngeal mask airway is superior than the proseal laryngeal mask airway in patients undergoing surgery under general anesthesia.
Keywords: general anesthesia, supreme laryngeal mask airway, outcome.

INTRODUCTION

The most crucial part of general anesthetic practice is the preservation of a clear upper airway. Advances in airway management have allowed the adoption of a laryngeal mask airway, which is less invasive, since the endotracheal tube was initially used to manage a patient's airway (LMA). Laryngeal mask airway (LMA) is used by anesthesiologists while operating on a patient to supply oxygen or anesthetic gas to the lungs for surgery. In the pre-hospital setting, this form of airway is used to transport unconscious patients[1].

The traditional LMA shape had to be adjusted in order to make the second generation of laryngeal masks[2], which led to the production of the masks in question. Many have been introduced in the last decade, such as the ProSealTM laryngeal mask airway from the Laryngeal Mask Company in Singapore, the i-gelTM supraglottic airway device from Intersurgical Ltd in Wokingham in Berkshire in the United Kingdom and the LMA SupremeTM from the same company[3]. SGDs from the second generation have characteristics that improve oesophageal and pharyngeal sealing due to the new design of the cuff. The cuff's design makes this possible. A gastric channel that permitted the passage of a gastric tube to vent air and gastric suctioning that reduced the risk of gastric aspiration was also a benefit[4]. In contrast, the Proseal Laryngeal Mask Airway (P-LMA) includes a custom-designed cuff and is reusable[5], Supreme LMA (S-LMA) on the other hand, can't be used again and again[6]. Devices like this can't be recycled.

The installation of 2nd generation supraglottic airway devices can be difficult due to the devices' unique form. Complications like postoperative cough and sore throat have been linked to these devices in the past. In addition, the LMA-S and LMA-P's features could lead to significant differences in their performance[7].

Even though there have been studies on this topic in the past, most of them were conducted on communities in the west, and local populations have very little data available. Since we have a large number of patients undergoing surgery while under general anesthesia, we thought it would be a good idea to compare the Supreme and proseal mask airways to see which is better, so we decided to do this study.

METHODOLOGY

People who are undergoing surgery while under general anesthesia will be the focus of this study, which aims to determine how effectively proseal and supreme laryngeal mask airways perform. People who underwent general anesthesia at a tertiary care hospital between December 2020 and June 2021 were recruited for this study with the approval of the hospital's Ethical Committee.

- STUDY DESIGN; Descriptive-Comparative Study

Inclusion Criteria: Adult patients undergoing elective surgery under General Anaesthesia

Exclusion Criteria:

1 Patients below age of 18 years and above 60 years
2 Emergency and obstetric surgery
3 Mallampatti III and IV on pre operative assessment

- Oropharyngeal pathology (as assessed on history and medical record).
- Any known pulmonary and cardiovascular diseases and risk of aspiration (full stomach, hiatus hernia, gastro-oesophageal reflux disease, emergency surgery).
- Patients with cervical spine fracture or instability.

Data Collection Procedure: All 154 patients who met the study's inclusion criteria were included in the trial. Following the acquisition of informed permission, the selected cases were then randomly separated into two groups, one labeled group P and the other designated group S. In the operating rooms, the same approach was used to provide anesthetic to each patient. In order to commence the procedure, the patient was given nalbuphine (0.1 mg/kg) and propofol (2.0 mg/kg). The patient was then given 0.15 mg/kg of cisatracurium and ventilated for a total of 3 minutes.

For those in the P group, a Proseal-LMA cuff was inflated to the manufacturer's suggested amount after being put into the

patient in accordance with their weight. A supreme laryngeal mask was used in Group S. The cuff was inflated once S-LMA was installed and the patient's weight was taken into account in inflating the cuff. During manual ventilation, it was clear that the airway was working well since the chest moved in the same way on both sides. Square wave capnography, the absence of gas leaks, and the absence of stomach insufflation were further evidence that the airway was operating adequately. Both teams documented the ease of installation and the time it took,blood streaks were visible or not after the airway had been removed. For the first twenty-four hours, researchers observed all of the patients to see if they experienced a cough or sore throat.

Statistical Analysis: SPSS version 25.0 was used for the statistical analysis. There was also information on the age and time of the insertion, as well as the mean value and the standard deviation of the data set. ASA status (I or II), ease of insertion, coughing, blood staining, and sore throat were all taken into account while calculating the frequency and percentage of each ailment (present or absent). The ease of insertion, coughing, blood staining, and sore throats in the two study groups were all measured using the Chi Square test. "t" tests were used to compare how long it took to insert the laryngeal mask. The lower the p-value, the more statistically significant it was.

RESULTS

An average age of 41.67 years with a standard deviation of 11.43 years was found among the participants in this study. 95 patients (61.69%) fell within the age range of 25-40. These 154 patients had a male to female ratio of 1:2.9, with 54 males (35.06%) and 100 females (64.94%). Table I displays the patient distribution by ASA status.

Table 1: summarizes the demographic and clinical features of the patients.

Demographics	(n)
Number of patients	154
Gender (M/F) ratio	54(35.06%)/100(64.9%)
Age in years (Mean± SD)	41.67 ±11.43
Weight in kg (Mean± SD)	72.2 ±12.5
Height in cm (Mean± SD)	171.0 ±8.0
BMI (Mean± SD)	24.7 ±7.8
ASA class (I/ II) ratio	110(71.42)/44(28.57)
Mallampati class (I/ II) ratio	96(62.33%)/58 (37.66%)

With Proseal-LMA and Supreme-LMA, the first insertion attempts were successful in 96% and 88% of patients, respectively, in the research. In the S-LMA group, the insertion time was significantly faster (19.17 2.69 min vs. 23.16 1.73 min). Cough in 27.27 percent vs 20.78 percent, blood staining in 18.18 percent vs 12.99 percent, and sore throat in 20.78 percent vs 3.90 percent were reported to be the most common side effects of Proseal-LMA versus Supreme-LMA, respectively (Table II & III).

Table 2: Comparison of ease of insertion and complications in both Groups.

		Group S (n=77)		Group P (n=77)		P value
		No.	%age	No.	%age	
Ease of insertion	Yes	68	88.32	74	96.10	0.071
	No	09	11.69	03	3.90	
Cough	Yes	16	20.78	21	27.27	0.346
	No	61	79.22	56	72.73	
Blood staining	Yes	10	12.99	14	18.18	0.374
	No	67	87.01	63	81.82	
Sore throat	Yes	03	3.90	16	20.78	0.001
	No	74	96.10	61	79.22	

Table 3: Comparison of insertion time in both Groups.

	Group S (n=77)		Group P (n=77)		P value
	Mean	SD	Mean	SD	
Insertion time (sec)	19.17	2.69	23.16	1.73	0.0001

DISCUSSION

A comparison and contrast of the P-LMA and the S-LMA has been done in certain researches. When the oropharyngeal leak pressure (OLP) was used as a benchmark, in some studies the results suggested that using any of these two airway devices resulted in the same outcome [8,9]. OLP was shown to be lower utilizing S-LMA than P-LMA in other studies[10,11]. While under general anesthesia, we wanted to test the effectiveness of both the proseal laryngeal mask airway and the supreme laryngeal mask airway.

Proseal-LMA and Supreme-LMA patients had 96.10 and 88.32 percent success rates, respectively, in their first attempts at inserting the devices, according to our study. In the S-LMA group, there was a substantial difference in the insertion time (19.17 2.69 min vs. 23.16 1.73 min). While blood stains were found in 18.18% Vs 12.99% , sore throat was found in 20.78% Vs 3.90% , and coughing was found in 27.27% Vs 20.78 % in P-LMA Vs S-LMA group.

With Proseal-LMA and Supreme-LMA, 92% and 96% of individuals were successful on their first try, respectively, according to a research[10]. Shorter insertion times were observed among patients who received the S-LMA treatment (23.67 1.83 min vs. 20.58 1.73 min). Comparing Proseal-LMA to Supreme-LMA. 28 % Vs 20.0% of the cases had a cough, 8 % Vs 16 % had blood stains, and 16 % Vs 4% had a sore throat[10].

First attempt S- LMA's success rates were claimed to be between 90% and 100%, whereas first time P-LMA's success rates were reported to range from 76% to 100%.[9,11].

It was determined that S-LMA inserts and P-LMA inserts took nearly the same amount of time during study comparing the two procedures[11].However,S-LMA had a much shorter insertion time than P-LMA, according to the findings of our study. The statistical significance of this difference is undeniable, but it is unlikely to have any therapeutic significance. When compared to the P-LMA, the S-LMA boasts a more attractive appearance. S-LMA's airway tube, in contrast to the P- LMA's flexible airway tube, is more stiff and shaped like a human body. Simple and risk-free installation results from the organization of the materials. Perhaps if researchers had more experience working with the S-LMA, they would have been able to complete the procedure in less time.

Both the S-LMA and the P-LMA were reported to have a 93% success rate by Hosten et al[12]. With S-LMA, insertion of an airway device took significantly less time than with P-LMA (12.5 ± 4.1 s vs. 15.6 ± 6.0 s; P = 0.02) in 60 patients who underwent laparoscopic cholecystectomy. Both S-LMA and P-LMA were tested for safety and potential applications by Seet et al in a clinical trial[13]. It was found that the S-LMA had a larger success rate on the first try than the P-LMA did in 99 adult patients who did not have paralysis (98 percent vs. 88 percent, respectively).

Following general anesthesia, a meta-analysis of 29 randomized prospective clinical trials found that using a laryngeal mask airway (LMA) resulted in considerably fewer incidences of hoarseness, coughing, and laryngospasm than did using an endotracheal tube (ET) [14]. A 60 cmH2O intracuff pressure was used in Hermite and colleagues' study to compare two supraglottic airway devices (the LMA-S and the Laryngeal Mask Airway Unique [LMA-U]). They found no significant differences in postoperative sore throat between the LMA-S and other airway devices[15]. Barreira et al. compared the LMA-S approach to the ETT method in their research[16]. ETT patients with cuff pressures ranging between 25 and 30 cmH2O had considerably greater rates of sore throats, the researchers reported in their study.

CONCLUSION

The supreme laryngeal mask airway was found to be more effective for patients undergoing general anesthesia than the proseal laryngeal mask airway, according to this study. The ultimate laryngeal mask airway is therefore recommended for patients undergoing surgery under general anesthesia. This will assist prevent issues from arising in the future.

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