ORIGINAL ARTICLE

A Comparison of Propofol Plus Sevoflurane Versus Propofol alone for Laryngeal Mask Airway Insertion

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ABSTRACT

Aim: To compare efficacy of propofol alone and combination of sevoflurane - propofol for LMA insertion in adults for elective surgery.
Study design: Non probability purposive sampling.
Material and methods: Ninety patients scheduled for surgical procedure were divided in two groups. Patients in group P received propofol and patients in group PS received propofol and sevoflurane for insertion of LMA. Both the groups were compared for efficacy of LMA insertion measuring the attenuation of laryngeal reflexes (full, partial and poor). The efficacy was considered full if the LMA insertion was achieved.
RESULTS: The 'Full' LMA insertion was achieved in 84.5% patients with propofol and in 73.3% patients with propofol and sevoflurane.
Conclusions: There was no statistically significant difference for insertion of LMA between propofol and combination of sevoflurane and propofol. Clinically propofol was more effective.
Keywords: Laryngeal mask airway; insertion; propofol; sevoflurane with propofol

INTRODUCTION

Since 1980, there had many upper airway devices that were developed to maintain the airway. Among those, laryngeal mask airway (LMA) which was introduced by Dr. Archie Brain, a British Anesthesiologist, became the most popular[1].

Laryngeal mask airway is a supraglottic device that is designed to provide and maintain a seal of controlled ventilation around the laryngeal inlet[2,3]. LMA provides a relatively secure hands free airway maintenance in place for a face mask for routine anesthesia among both children and adults[4]. Currently, its use is growing in place of a face mask or tracheal tube during administration of anesthesia.

As the use of LMA has been widely accepted in elective short surgical procedures in which tracheal intubation is not required, [5] difficult airway, cardiac arrest and pre-hospital airway management[6,7,8].

Since the beginning of modern anesthesiology to the end of the 19th century several techniques have been developed for insertion of LMA, the use of which depends upon the situation. So far, several studies have been conducted to conduct an optimal method and pharmacological agent for insertion of LMA. Propofol, thiopentone, etomidate, ketamine and muscle relaxants have been used individually or as mixture in combination as a intravenous agents for insertion of LMA[9,10]. Among these, a popular method of providing anaesthesia for LMA insertion is, the use of intravenous propofol premixed with lidocaine which has advantage of inducing anaesthesia rapidly and depressing air way reflexes. However use of propofol is associated with several adverse effects including pain on injection, apnoea and hypotension[11].

Inhalational agents have also been used for induction of anesthesia and hence for insertion of LMA. Inhalational agents alone are required to induce anesthesia in children who cannot tolerate intravenous (IV) agents or in whom IV access is difficult. However, they are associated with some problems like, longer time for induction and theater pollution[12].

Among the inhalation agents, Sevoflurane is widely used for LMA insertion. It provides better haemodynamic stability and smooth transition to the maintenance phase[13]. Sevoflurane is associated with significantly less incidence of apnoea as compared to propofol[6]. However it is also associated with delayed jaw relaxation and longer time for insertion of LMA[14].

MATERIAL AND METHODS

After approval from ethical committee of Sharif Medical City hospital, ninety ASA I & II patients aged 18-65 years, undergoing surgical procedures under LMA insertion were included. Patients were divided in two equal groups comprising of 45 in each group. In Group P propofol was used while in Group PS both propofol and sevoflurane were used to facilitate LMA insertion. Non Probability purposive method was used for sampling. Inclusion criteria were, day case

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surgical patients undergoing minor surgical procedures like EUA, cystoscopy, hemorrhoidectomy and excision of lump breast. All the emergency surgical procedures**,** patients with improper fasting, Mallampait grade 3 & 4 and the patients sensitive to propofol or sevoflurane were excluded from the study. Ninety patients were selected. Informed consent was taken after explaining risks and benefits to the patients. Data was collected regarding patient demography, ASA status; type of surgical procedures. The patients were randomly allocated by applying random number table to one of two groups.

None of the patient was premedicated. Patients included in both the groups were pre-oxygenated with 100% oxygen for 3minutes. Patients in group PS received induction with propofol 1.5 mg/kg intravenously premixed with lidocaine given over 30 seconds along with sevoflurane with 8% dial concentration in a 2:1 of nitrous oxide to oxygen and fresh gas flow of 6 liter/min.

The start of induction was taken as the patient completed a single vital capacity breath .The patient were asked to open the eyes after 10 seconds .Failure to do so was taken as loss of consciousness. Thirty seconds after completion of propofol induction, ease of mouth opening was assessed, (possible or impossible). If mouth opening was impossible, attempts were repeated up to 04 times. In between attempts oxygen was delivered to patients. Each attempt preceded by propofol bolus 0.5mg/kg.

Patients in group P received induction with propofol 3 mg/kg intravenously premixed with lidocaine given over 30 seconds, rest of the steps were as mentioned above for the PS group. Failure of insertion of LMA after 04 times was rescued with succinylcholine 25 mg intravenously. Non invasive arterial blood pressure, O_2 saturation and heart rate were recorded every minute for 05 minutes as both propofol and sevoflurane cause hypotension and apnea so these parameters were monitored. An independent observer recorded the time to loss of eye lash reflex alongwith jaw relaxation. Efficacy was considered if there was full LMA insertion (loss of eye lashes along with jaw relaxation).

RESULTS

Data was analyzed using SPSS (version 10). Statistical analysis involved was mean and standard deviation and were calculated for age and weight. Frequency and percentage was calculated for gender and LMA insertion classification (full, partial and poor). The two groups were compared for efficacy using chi-square test. P≤0.05 was considered significant. The patients were compared for age, gender, weight and ASA classification. No statistical significance was found between the two groups (Table 1).

Patients were assessed for the insertion of LMA. In group P, full insertion was achieved in 38(84.4%) patients, partial insertion was noticed among 5(11.1%) patients and poor insertion was observed in 2(4.4%) patients (Fig.1). In group PS, there were 33(73.3%) patients in whom Full LMA insertion was achieved. In 8(17.8%) patients, partial and in 4(8.9%) patients poor insertion was noticed (Fig.2). The status of LMA insertion was not found statistically significantly different between the two groups (Table 2).

Table 1

	Group P	**Group PS**	**p-value**
Mean age/ yrs (SD)	35.67 + 9.08	34.58+9.62	>0.05
Mean weigh/kg (SD)	54.42 +5.05	64.61+4.04	>0.05
Mean height / cm	156.61+6.51	153.03+5.11	
	54.42 +5.05	64.61+4.04	
	54.42 +5.05	64.61+4.04	

Fig. 1: Distribution of patients by classification of LMA insertion in group P (n=45)

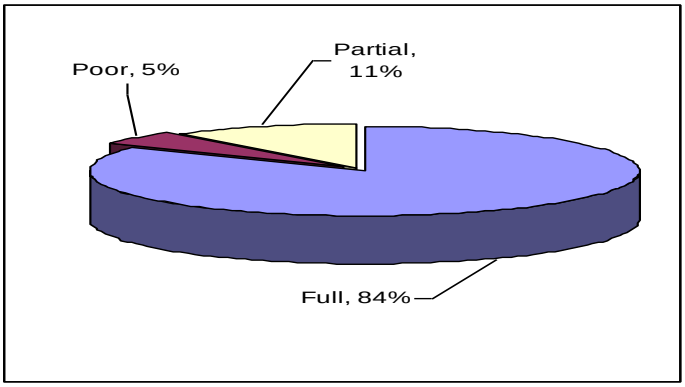

Fig. 2: Distribution of patients by Classification of LMA insertion in group PS (n=45)

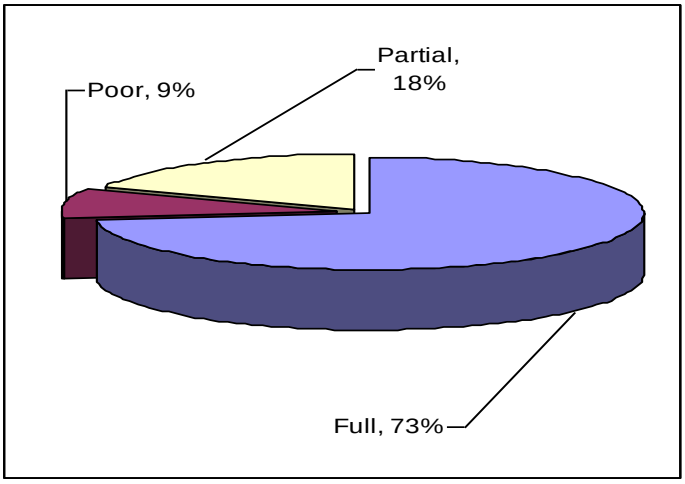

Table 2: Distribution of patients by LMA insertion in both groups (n=90)

LMA Insertion	Group P	Group PS	Total	P value
Full				
Number	38	33	71	**0.197 (NS)**
Group%	84.4%	73.3%	78.9%	
Total %	42.2%	36.7%	78.9%	
Partial				
Number	5	8	13	**0.368 (NS)**
Group %	11.1%	17.8%	14.4%	
Total %	5.6%	8.9%	14.4%	
Poor				
Number	2	4	6	**0.398 (NS)**
Group %	4.4%	8.9%	6.7%	
Total %	2.2%	4.4%	6.7%	
Total				
Number	45	45	90	
Group %	100.0%	100.0%	100.0%	
Total %	50.0%	50.0%	100.0%	

NS: Not significant

DISCUSSION

In literature, there are several studies which have compared the efficacy of propofol with sevoflurane and the results shown by them are different in different settings. In our prospective study we compared the propofol versus combination of propofol and sevoflurane for insertion of LMA in elective surgical procedures. This study is one of the largest studies in this context which included 90 patients. Before that Wajima Z et al, [15] compared the efficacy of propofol and combination of sevoflurane and propofol for anesthesia induction in 50 patients. Siddik-Sayyid SM[16] et al. also compared the efficacy of two techniques among 83 patients. This was a retrospective study while ours study is prospective study.

Various studies have utilized different parameters to assess the efficacy of the two techniques i.e. propofol versus propofol with sevoflurane. The parameters used in our study were very similar to that used by Siddik-Sayyid SM, et al[16] i.e., loss of jaw reflexes and loss of eye lash reflexes. Duration of apnea and cardiovascular stability has also been used. Insertion time, tidal volume breath, complications and cardiovascular instability were also used by Shao et al[17].

When outcomes of insertion of LMA are compared with different studies, our study did not show results in favor of LMA insertion with propofol with sevoflurane. Only 73.3 % patients showed full insertion, where as 84.4% insertion efficacy was achieved among patients with propofol alone. In contrast to our study, the results of study by Siddik-Sayyid et al[16] are in favor of insertion of LMA with sevoflurane with propofol. They concluded a success of insertion in 93.5% patients with use of sevoflurane with propofol as compared to that propofol alone i.e. 61.5%. The insertion rate of LMA was quite lower in either group to that of study by Siddik-Sayyid. It was a maximum of 73.3% in our study, while in that of by Siddik-Sayyid, it was 93.5%.

In a study by Ummenhofer WC, et al, [18] concluded that use of propofol had a relaxant effect on jaw muscles. Rosenberg H, et al, [19] concluded that inhaled anesthetics may cause increased muscle tone. Therefore, results of our study can also be related to that finding as more relaxation of jaw muscles may be helpful in easier and smoother insertion.

This study has certain limitations. This was not a double blind study, as it was not possible because one of the agent is inhalational agent and other is IV drug. Moreover, we did not comment on the experience of the anaesthetist, which may be a possible cause of the lower rate of insertion as compared to other international studies.

Although, the results of this study were not significant, it has favored the use of propofol for insertion of LMA for surgical procedure as compared to that of propofol and sevoflurane. However, still large, multicentre clinical trials are required to assess the efficacy of the both techniques.

CONCLUSION

Although the results were not significant statistically, propofol is comparatively more effective than combination of sevoflurane and propofol for the insertion of LMA .However, multicentre studies for a longer period are required to better estimate of better outcome by the two methods.

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