

Laryngeal Mask Insertion Using Thiopental and Low Dose Atracurium: A Comparison with Propofol

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Abstract

Introduction: In airway management, comparison of laryngeal mask airway is a new concept. It avoids the hazards of tracheal intubation and at the same time has many advantages over the traditional face mask. **Aims:** The present study was performed to evaluate to laryngeal mask insertion using thiopental sodium and low dose atracurium is comparison with propofol. **Materials and Methods:** A total number of seventy (70) cases ASA I and ASA II Grade were considered in the study and patients were divided into two Groups. Thirty five (35) of them induced with thiopental sodium and low dose of atracurium and the other thirty five (35) patients were induced with propofol for comparison of insertion conditions of LMA. **Results:** Between the Groups, there was no statistical difference with respect to age, weight and sex. Jaw relaxation, insertion conditions are same in both Groups. But incidence of coughing gagging is more in Group I compared with Group II. Total score is good in group compared with Group I. All these parameters are statistically not significant. **Conclusion:** A significantly greater ease of insertion of the LMA was observed and significantly lesser time taken for insertion was observed in patients induced with propofol as compared to thiopental sodium and low dose atracurium.

Keywords: Thiopental; Atracurium; Propofol.

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Introduction

In airway management, a new concept came into picture which is Laryngeal Mask Airway (LMA). Laryngoscopy and intubation, on the other hand, may result in injury to the lips, teeth, gums and soft tissue of the pharynx and laryngeal inlet as well as may lead to post-extubation sore throat. Such complications are avoided in LMA insertion and it does not require laryngoscopy. For the patients,

LMA may be life-saving in complicated intubation cases. In year 1996, LMA and ASA were incorporated together in complicated airway algorithm.¹ Lesser skill requirement and emergence with LMA in situ with smoother transition from anesthesia are the advantages of LMA which has made it more popular among the anesthesiologists. To provide and maintain a seal around the laryngeal inlet for spontaneous ventilation as well for positive pressure ventilation, insertion of this supraglottic device requires sufficient depth of anesthesia and depression of airway

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reflexes to avoid adverse reactions like gagging, coughing, head and limb movements etc. This study had been taken up with an idea of comparing the condition for LMA insertion, by two most widely used intravenous inducing agents, considering the advantages of LMA over face mask and endotracheal intubation.^{2,3} Objective was to design an airway that offers some of the advantages of tracheal intubation while avoiding the need for visualizing the larynx and penetration of the laryngeal opening. So, it avoids the hazards of tracheal intubation and at the same time has many advantages over the traditional face mask. The present study is undertaken to study the efficacy of low dose atracurium and thiopental sodium compared with propofol for insertion of laryngeal mask airway.

Materials and Methods

This study was a prospective comparative study which was approved by Institutional Ethical Committee and a written informed consent was obtained from patients. A total number of seventy adult patients of ASA Grade I and II who were undergoing elective surgical procedures either as daycare or as in-patients were included in this study. Patients of both genders, aged 14–60 year are selected. In the anesthesia room, O₂ Saturation, ECG and Blood pressure monitoring were checked. Patients were randomly allocated into two Groups. Group I: Thiopentone with low dose atracurium, Group II: Propofol. Both Groups received Glycopyrolate and midazolam (0.04 mg/kg) and tramadol (1 mg/kg) prior to induction. After three minutes of pre-oxygenation anesthesia was induced with 2.5 mg/kg propofol (Group II), thiopental Sodium (5 mg/kg) + atracurium (0.05 to 0.1 mg/kg) (Group I), The induction agent was given at a constant rate over 30 seconds. After 30 seconds, one anesthetist, who was unaware of the drug administered, assessed the adequacy of anesthesia (loss of verbal command and eye lash reflex loss). If this was found to be adequate, LMA insertion was attempted using a standard technique. If the anesthesia was inadequate, propofol (0.25 mg/kg) and thiopental sodium (0.5 mg/kg) injection was repeated. Following LMA insertion, anesthesia was injected with 66 N₂O, 33 O₂ and 2–3 isoflurane (or) halothane. Grading was done on a three-point scale using six variables *i.e.*, jaw opening, ease of insertion, coughing, gagging, laryngospasm, airway obstruction, and patient movements. Hemodynamic parameters were evaluated such as pulse rate, blood pressure (systolic, diastolic, mean) were monitored at base line, before pre-meditation, 2 minutes after

giving midazolam, glycopyrolate, tramadol and 3 minutes after LMA insertion monitoring for the purpose of study was stopped when the patient was considered to have reached a state of adequacy in anesthesia and was well settled after insertion of the LMA. Parameters measured were jaw relaxation (young clark and Dundee), insertion conditions [Lund and Stovner], incidence of coughing and gagging (NIMMO), minimum score of 3 was best and maximum of 10 was worst and apnea time which is the time from insertion of LMA until return of first spontaneous breath. After the end of the operation oxygen given, observed for vitals and sore throat.

Results

Table 1: Demographic data

Patient details	Group I	Group II	p - value
Age (years) (mean ± SD)	34.92 ± 13.61	35.96 ± 13.10	0.784
Weight (kg) (mean ± SD)	50.36 ± 6.71	48.52 ± 7.48	0.364
Gender (M/F)	20/15	20/15	

Table 1 shows that there were no statistically significant difference between the groups with respect to age, weight and sex.

Table 2: Ease of LMA insertion

Ease of insertion	Group I	Group II	p-value
Jaw relaxation (mean ± SD)	1.08 ± 0.27	1.00 ± 0.00	0.155
Insertion conditions (mean ± SD)	1.08 ± 0.27	1.00 ± 0.00	0.155
Coughing and gagging (mean ± SD)	1.24 ± 0.44	1.16 ± 0.37	0.48
Total score (mean ± SD)	3.40 ± 0.58	3.16 ± 0.38	0.087

Table 2 shows that jaw relaxation, insertion conditions are same in both groups. But incidence of coughing and gagging is more in Group I compared with Group II. Total score is good in Group compared with Group I. All these parameters are statistically not significant.

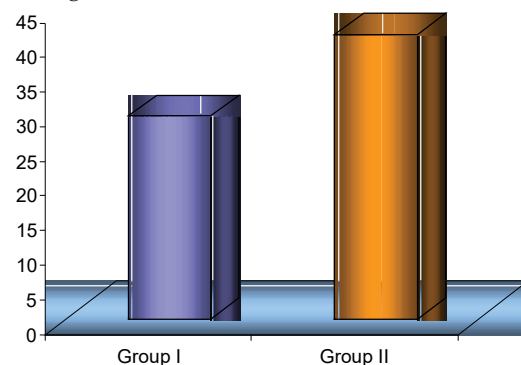


Fig. 1: Apnea time (Sec)

Table 3: Comparison of heart rate between the groups

Groups	Base line	After pre-meditation	During insertion	Post LMA				
				1 min	2 min	3 min	4 min	5 min
Group I (mean ± SD)	91.90 ± 17.41	96.96 ± 19.00	93.96 ± 18.22	93.84 ± 15.88	94.22 ± 15.46	94.68 ± 16.47	93.80 ± 16.02	94.16 ± 12.91
Group II (mean ± SD)	96.30 ± 15.54	96.80 ± 19.34	99.72 ± 19.29	98.12 ± 70.56	97.44 ± 16.92	98.36 ± 17.91	8.80 ± 17.22	98.60 ± 18.40
<i>p</i> -value	0.34	0.97	0.28	0.37	0.49	0.45	0.29	0.32

Table 4: Comparison of mean arterial pressure between the groups

Groups	Base line	After pre-meditation	During insertion	Post LMA				
				1 min	2 min	3 min	4 min	5 min
Group I (mean ± SD)	93.72 ± 9.53	93.72 ± 8.49	94.80 ± 7.61	91.12 ± 8.76	88.52 ± 13.64	85.76 ± 9.93	87.28 ± 9.89	88.92 ± 10.99
Group II (mean ± SD)	92.56 ± 9.20	91.56 ± 9.79	88.54 ± 8.27	88.24 ± 12.44	83.60 ± 9.68	82.28 ± 9.59	82.40 ± 10.11	84.80 ± 10.61
<i>p</i> -value	0.66	0.40	0.0075**	0.34	0.14	0.21	0.09	0.18

Fig. 1 displayed that apnea time is more in Group II compared with Group I. It is statistically significant ($p < 0.00002$).

Table 3 shows that heart rate base line value during insertion, post LMA 1 minute, 2 minutes, 3 minutes, 4 minutes and 5 minutes are more in Group II compared with Group I. It is statistically not significant.

Table 4 shows that mean arterial pressure is less in Group II compared Group I. But more drop of mean arterial pressure during insertion period. But it is statistically not significant.

Discussion

In many studies, intubating conditions for the laryngeal mask airway using thiopental sodium and low dose atracurium were compared with propofol. However, in the present study, it was found that for the same end point of induction, which is the loss of eye lash reflex in both the groups, compared to thiopental sodium and low dose atracurium, LMA insertion conditions were superior with propofol. Kwong Fah Koh *et al.*⁴ observed that there was no difference in insertion conditions between Groups I ($\mu\text{g}/\text{kg}t^{-1}$ fentanyl, $2.5 \mu\text{g}/\text{kg}t^{-1}$ propofol), III ($\mu\text{g}/\text{kg}t^{-1}$ fentanyl, $5 \text{mg}/\text{kg}t^{-1}$ thiopental) and I.V. ($0.05 \text{mg}/\text{kg}t^{-1}$ or $0.1 \text{mg}/\text{kg}t^{-1}$ atracurium) Group II ($\mu\text{g}/\text{kg}t^{-1}$ fentanyl, $5 \mu\text{g}/\text{kg}t^{-1}$ thiopental) produced the worst overall conditions ($p < 0.05$). There were no differences in hemodynamic changes and apnea times between all four Groups where as in the present study, there was no statistical difference with respect to age, weight and sex between the Groups. In both Groups, jaw

relaxation, insertion conditions were same. But incidence of coughing gauging is more in Group I (thiopental sodium and low dose of atracurium) compared with Group II (induced with propofol). Total score is good in Group II compared with Group I. All these parameters are statistically not significant. Ahmeduddin Soomro *et al.*⁵ reported that propofol Group had significantly lower induction time when compared to the sevoflurane Group. LMA insertion was excellent in 93.3% patients of propofol Group and 80% patients in sevoflurane Group. LMA insertion conditions were not statistically significant between Groups (p -values = 0.245). Between groups, mean arterial pressure was observed statistically significant ($p = 0.021$). Both Groups showed significant drop in mean arterial pressure. There was no statistically significant difference in heart rate between groups ($p = 0.09$). Khan P *et al.*⁶ observed that compared to propofol in 26%, thiopentone was associated with an adverse response in 76% of patients ($p < 0.01$). Using thiopentone, head movement, laryngospasm, inadequate jaw relaxation were more common ($p < 0.05$). The quality of anesthesia according to patients was significantly higher in the Propofol Group (Group A, 80%) than in Thiopentone Group (Group B, 30%). In study conducted by Shirish Kumar G C *et al.*⁷ sevoflurane took a longer time for induction and for LMA insertion than propofol. There was no statistically significant difference between the two Groups, with respect to LMA insertion characteristics, heart rate, mean arterial pressure. It is concluded that sevoflurane is associated with good hemodynamic stability and may prove useful incases where propofol is to be avoided. In study conducted by Hickey *et al.*⁸ a significant increase in both arterial

pressure and heart rate followed insertion of either the laryngeal mask or the Guedel airway, with no significant differences between the groups at any time and cardiovascular effects related to LMA insertion were compared with those after insertion of a Guedel oral airway in 103 American society of anesthesiologists Type I and II (ASA Grade I & II) patients scheduled for elective surgical procedures. Ho *et al.*,⁹ reported a mean arterial pressure decrease of 12.6 mm Hg and a mean heart rate increases 5.5 beats/minute in patients induced with 2.5 mg/kg propofol to facilitate insertion of the LMA. In present study, a decrease in mean arterial pressure and increase mean heart rate in propofol (2.5 mg/kg) was observed to facilitate insertion of the LMA.

Conclusion

It was concluded that ease of insertion of the LMA was significantly greater and time taken for insertion was significantly less in patients induced with propofol as compared to thiopental sodium and low dose atracurium.

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