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To Compare The Efficacy of Thiopentone with Laryngeal Spray of 4% Lidocaine and Propofol for Laryngeal Mask Airway (LMA) Insertion.

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Introduction: *Airway management is one of the most important skills in the field of anesthesiology and inability to secure the airway can lead to catastrophic results. Before 1990, only the face mask and the endotracheal tube (ETT) were the available airway devices. Since then several supraglottic airway devices have been developed, of which the laryngeal mask airway (LMA) is the most popular one.* ***Materials and Methods:*** *The study was conducted at Kamineni Institute of Medical Sciences, Narketpally, Nalgonda (Dist), A.P, during the period of October 2011 to September 2013. A prospective randomized double blind study was conducted on 80 patients of ASA I and II between the age group of 18-60 years undergoing various elective minor surgical procedures i.e breast abscess, fibroadenoma of breast, cervical lymphnode excision biopsy, Incisional biopsy of axillary lymphnode, collies reduction, under general anaesthesia. Patients were randomly divided into two groups of 40 each. Group A – Propofol group, Group B – Thiopentone with local anaesthetic spray group.* ***Results:*** *Excellent insertion score was observed in 35(87.5%) and 34(85%) patients in group A and group B respectively. Insertion score was satisfactory in 5(12.5%) patients of group A and 6(15%) patients of group B. None of the patients had poor insertion score in both the groups. The groups were statistically insignificant.* ***Conclusion:*** *In conclusion, we have shown that if 30 mg of topical lignocaine is sprayed onto the posterior pharyngeal wall 3 minutes before induction of anaesthesia with thiopentone, the conditions for insertion of an LMA are equal to those following an equipotent dose of propofol, but with greater haemodynamic stability and significantly less respiratory depression.*

Key words: *Thiopentone, Laryngeal Spray, Lidocaine, Propofol, Laryngeal Mask Airway*

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I. Introduction

Airway management is one of the most important skills in the field of anesthesiology and inability to secure the airway can lead to catastrophic results. Before 1990, only the face mask and the endotracheal tube (ETT) were the available airway devices. Since then several supraglottic airway devices have been developed, of which the laryngeal mask airway (LMA) is the most popular one[1]. The laryngeal mask is a new form of airway (LMA), which is introduced blindly into the hypopharynx to form a seal around the larynx. It has been shown to provide a clear airway and leaves the anaesthesiologist's hands free[2]. In order to introduce LMA during anaesthesia, one requires an induction agent eg; propofol or thiopentone which are the most commonly used induction agents[3]. The insertion of LMA requires the abolition of upper airway reflexes to prevent gagging, coughing and laryngospasm. Propofol depresses airway reflexes more than thiopentone and therefore allows easy insertion of LMA with reduced incidence of gagging, coughing and laryngospasm. Although propofol is the most commonly used induction agent to facilitate the placement of LMA, this drug may not be available for regular use worldwide. A less expensive and equally effective induction technique would be a useful alternative[4]. Thiopentone has been assessed for the insertion of an LMA but produces less satisfactory conditions than propofol. This may be because propofol is more effective at suppressing airway reflexes than thiopentone[5].

Various drugs are used as adjuvants to thiopentone to decrease the incidence of adverse responses to insertion of the LMA like Lidocaine topical or IV, Benzodiazepines like Midazolam, Low dose muscle relaxants like atracurium. Hence, the present study is designed to assess whether the application of lignocaine to the posterior oropharynx prior to the use of thiopentone would allow the insertion of an LMA

Aim: To compare the efficacy of Thiopentone with laryngeal spray of 4% Lidocaine and Propofol for laryngeal mask airway (LMA) insertion.

Objectives: 1. To compare the insertion conditions of Laryngeal Mask Airway
2. To assess LMA insertion condition's

II. Materials and Methods

The study was conducted at Kamineni Institute of Medical Sciences, Narketpally, Nalgonda (Dist), A.P, during the period of October 2011 to September 2013. A prospective randomized double blind study was conducted on 80 patients of ASA I and II between the age group of 18-60 years undergoing various elective minor surgical procedures i.e breast abscess, fibroadenoma of breast, cervical lymphnode excision biopsy, Incisional biopsy of axillary lymphnode, collies reduction, under general anaesthesia. Patients were randomly divided into two groups of 40 each. Group A – Propofol group, Group B – Thiopentone with local anaesthetic spray group

Inclusion criteria: ASA grade I and II, Age 18-60 years, Weight 30-80 kg, Who give informed consent, Scheduled to undergo various elective minor surgical procedure under general anaesthesia.

Exclusion criteria: Risk of gastric aspiration, Smokers, Patients undergoing oral surgeries, . Grossly obese patients, Those with respiratory diseases, ASA grade III and above.

Pre -Anaesthetic Evaluation:

Patients were visited on the previous day of surgery and the procedure was explained to them. A detailed medical history was taken and systematic examinations were carried out and relevant investigations (complete blood picture, bleeding time, clotting time, blood sugar, serum creatinine, serum electrolytes, blood urea, ECG and chest X-ray) were advised. An informed valid written consent was taken from all the patients. Nil per oral status was maintained for all the patients for 8 hours.

Anaesthetic Technique :

On arrival at the operation theatre, patient connected to multi para meter and baseline vital data were recorded using pulse oximeter (for O_2 saturation), ECG and Non Invasive Blood Pressure. An intravenous line was secured and the patient's Both groups received Inj.glycopyrrolate (0.2mg) IV, Inj.midazolam (0.05mg/kg) IV and Inj. pentazocin (0.3mg/kg) IV prior to induction.

All patients were preoxygenated for 3 minutes. In group A after preoxygenation anaesthesia was induced with propofol 2.5 mg/kg IV. In group B , the patients were given 3 sprays of 4% lignocaine to the posterior oropharynx before preoxygenation and anaesthesia was induced with thiopentone 5 mg/kg IV. Loss of eyelash reflex was considered as the end point of induction in both groups. An appropriate size of LMA was introduced using standard technique by an experienced anaesthesiologists blinded to the dose and type of induction agent. He stayed outside the anaesthetic room during the initial induction period and was called after the loss of eyelash reflex for the insertion of the LMA. The cuff was inflated with the recommended volume of air. Proper placement was assured by observing bag movements and auscultating chest for bilateral equal air entry. Following LMA insertion, anaesthesia was maintained with nitrous oxide in oxygen along with halothane with the patient breathing spontaneously. The anaesthesiologist who performed the LMA insertion also graded the LMA insertion conditions accordingly to[6]

Mouth opening	-	3= Full, 2= Partial, 1= Nil,
Coughing	-	3= Nil, 2= Mild, 1= Severe
Gagging	-	3= Nil, 2= Mild, 1= Severe
Laryngospasm	-	3= Nil, 2= Mild, 1= Severe
Limb movements	-	3= Nil, 2= Mild, 1= Severe
Ease of insertion	-	3= Easy, 2= Difficult, 1= Impossible

The six variables, three point scores were then summed to give an overall insertion condition score[7].

Total score Insertion condition

18	Excellent
16-17	Satisfactory
<16	Poor

Statistical Analysis: Data were entered in MS Excel and analyzed in SPSS V19. Descriptive statistics were represented with percentages. Independent t-test, Chi square test and Fisher's exact test were applied to find significance between the groups. $p<0.05$ was considered statistically significant.

III. Results

The mean age in group A was 34.80 ± 9.67 years and in group B was 34.1 ± 8.71 years.

Average age between two groups was not showing significance.

Group A had 19 male patients which constituted (47.5%) and 21 female patients making up for (52.5%), whereas group B had 16 male patients (45%) and 24 female patients (55%). The gender distribution in the two groups was not significant.

Mean weight was (54.32±9.23) in group A and (51.75±8.64) in group B, which was not significant

Mouth opening was graded as Full in 37(92.5%) in group A and 36(90%) in group B patients while 3(7.5%) patients in group A and 4(10%) patients in group B showed partial grade of mouth opening. None of the patient showed Nil grade of mouth opening. It was not significant

In group A none of the patients had coughing of any grade. In group B Nil response was observed in 39(97.5%) patients and mild grade of coughing in 1(2.5%) patient. The response was found to be statistically insignificant.

Nil response was observed in 38(95%) of patients in both the groups and 2(5%) patients in both the groups showed mild grade of gagging. None of the patients showed severe grade of gagging. It was not significant.

None of the patients developed laryngospasm in both the groups.

According to above table 37(92.5%) patients in group A and 38(95%) patients in group B showed Nil response with respect to limb movements. Mild limb movements were present in 3(7.5%) and 2(5%) patients of group A and group B respectively. None of the patients had severe limb movements in both the groups. It was not significant.

In group A 39 (97.5%) patients and 38(95%) patients in group B had easy insertion of LMA. Difficulty in insertion was observed in 1(2.5%) patient in group A and 2(5%) patients in group B. None of the patient came in to the impossible category in both the groups. The ease of insertion when compared amongst the groups shows statistically insignificant difference. Excellent insertion score was observed in 35(87.5%) and 34(85%) patients in group A and group B respectively. Insertion score was satisfactory in 5(12.5%) patients of group A and 6(15%) patients of group B. None of the patients had poor insertion score in both the groups. The groups were statistically insignificant.

IV. Discussion

'A' of an Anaesthesiologist reminds him of its most responsible works of providing a secure and an adequate 'A' and 'B' of cardiopulmonary resuscitation. 'A' is an airway, 'B' stands for breathing. Although endotracheal intubation has a long history of the most widely accepted techniques in anaesthetic practice, it is not without complications, most of which arise from the need to visualize and penetrate the laryngeal opening[8]. Increasing emphasis on day care anaesthesia has led to a greater use of the laryngeal mask airway in place of the facemask and in some cases to tracheal intubation during anaesthesia[9].

In 1981 Dr Archie Brain began looking at the anatomy of the upper airway and he began the development of the laryngeal mask airway[10]. It was designed primarily as a means of offering some of the advantages of endotracheal intubation while avoiding this fundamental disadvantage, since the vocal cords need be neither visualized nor forced apart[8].

Satisfactory insertion of the LMA requires suppression of airway reflexes. A popular method of providing anaesthesia for LMA insertion is with the use of IV propofol, which has the advantage of inducing anaesthesia rapidly and depressing upper airway reflexes[7]. It is associated with a greater ventilatory depression and longer apnea than is thiopentone. Propofol also causes greater cardiovascular depression than thiopentone during induction of anaesthesia. A cardiorespiratory stable alternative to propofol induction would be advantageous[11].

Thiopentone has been assessed for the insertion of an LMA but produces less satisfactory conditions than propofol. This may be because propofol is more effective at suppressing airway reflexes than thiopentone[5].

Lignocaine, a local anaesthetic in an intravenous or topical form has been widely used for attenuation of response to laryngoscopy. Intravenous lidocaine acts by a direct depressant action on the central nervous system while the topical form acts by anaesthetising peripheral cough receptors in the hypopharynx and trachea in addition to central action after systemic absorption[12].

Mouth Opening: In the present study mouth opening, we observed full mouth opening in 37(92.5%) patients in group A and 36(90%) patients in group B. 3(7.5%) patients in group A and 4(10%) patients in group B showed partial grade of mouth opening. None of the patient showed nil grade of mouth opening. Comparison of mouth opening in accordance with Vandana Talwar et al[6] study.

Coughing: In the present study coughing, the incidence of coughing was comparable in both the groups (A=0(0%) vs B=1(2.5%)). In a study conducted by C.R. Seavell et al[5], coughing was present in one patient in thiopentone group compared to none in propofol group. In a study conducted by Vandana Talwar et al[6] none of the patients developed coughing in both the groups. Comparison of coughing in accordance with C.R. Seavell et al[5] and Vandana Talwar et al[6].

Gagging: In the present study gagging, 2 (5%) patients in each group showed mild grade of gagging which was comparable between the two groups. In a study conducted by S Keerthi Kumar et al[3] 2 (1%) patients in group A and 1(0.5%) patient group B developed gagging which was comparable. Our results correlate with this study.

Laryngospasm: In our study (Table no IX) none of the patients developed laryngospasm in both the groups.

Patrick Scanlon et al[9] reported higher incidence of laryngospasm in thiopentone group (30%) compared to propofol group (9%) which was statistically significant. Our results correlate with this study.

Limb Movement: In our study 37 (92.5%) patients in group A and 38 (95%) patients in group B showed nil response with respect to limb movements. Mild limb movements were present in 3(7.5%) and 2(5%) patients of group A and group B respectively. None of the patients had severe limb movements in both the groups. The incidence was statistically insignificant. In S Keerthi Kumar et al[3] study 3 (1.5%) patients in propofol group and 4 (2%) patients in thiopentone group moved head and limbs during LMA insertion which was comparable between the groups. Patrick Scanlon et al[9] observed higher incidence of limb movements in thiopentone group (35%) compared to propofol group (20%) which was statistically insignificant. Our results correlate with these studies.

Ease of Insertion: In our study ease of insertion was easy in 97.5% of patients in group A and 95% of patients in group B. Difficulty in insertion was observed in 1 (2.5%) patient in group A and 2 (5%) patients in group B which was statistically not significant. In a study Driver. I et al[13] observed that LMA insertion was easy in all the patients in propofol group and none of the patients had difficulty in insertion of LMA. In thiopentone group out of 35 patients, LMA insertion was easy in 33 patients and 2 patients showed some difficulty in insertion of LMA. The results were statistically insignificant. Our results correlate with this study.

Overall Insertion Condition: In our study, excellent insertion score was observed in 35 (87.5%) and 34 (85%) patients in group A and group B respectively. Insertion score was satisfactory in 5 (12.5%) patients of group A and 6 (15%) patients of group B. None of the patients had poor insertion score in both the groups. In S Keerthi Kumar et al[3] study overall successful insertion of LMA was observed in 99% of patients in propofol group and 99.5% in thiopentone group which was comparable. Our results correlate with this study.

V. Conclusion

In conclusion, we have shown that if 30 mg of topical lignocaine is sprayed onto the posterior pharyngeal wall 3 minutes before induction of anaesthesia with thiopentone, the conditions for insertion of an LMA are equal to those following an equipotent dose of propofol, but with greater haemodynamic stability and significantly less respiratory depression.

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