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EVALUATING THE EFFECT OF INTRAVENOUS LIGNOCAINE ON IMPROVING THE CONDITION FOR LARYNGEAL MASK AIR WAY PLACEMENT UNDER THIOPENTONE ANAESTHESIA

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ABSTRACT

Objective: To find out whether intravenous lignocaine improves the condition for Laryngeal Mask Airway (LMA) placement under thiopentone anaesthesia.

Design: A prospective study.

Place and duration of Study: Combined Military Hospital, Peshawar.

Patients and Methods: 100 ASA I and II patients were selected and were randomly divided into two groups. Group-I patients received saline while group-II pts received 1.5 mg /kg of lignocaine prior to induction with thiopentone sodium. Three variables, (Jaw opening, Coughing and ease of placement of LMA) were evaluated.

Conclusion: Study showed that lignocaine facilitated first attempt LMA placement in 60% of the patients, accompanied by ease of jaw opening in 58% and devoid of coughing in 62% of the patients. This shows that lignocaine significantly reduces the laryngospasm which occurs during LMA placement under thiopentone anaesthesia, due to its ability to suppress the upper airway reflexes. Therefore, it is concluded that intravenous lignocaine gives better results than normal saline.

Keywords: Lignocaine, thiopentone sodium, laryngeal mask airway

INTRODUCTION

LMA is a relatively new solution to the problem of airway management. Dr. Archibald Brain, a London Anaesthesiologist, designed its prototype in 1981. The device was first presented for clinical use in 1988. Since then it has rapidly established itself as a reliable mode of maintenance of airway, in routine as well as in difficult circumstances [1-4].

Almost all induction agents have been used for insertion of LMA, but coughing and gagging make placement of LMA difficult under I.V thiopentone alone [5], as it appears to depress the laryngeal reflexes to a lesser extent than other areas of CNS. The haemodynamic responses occurring due to coughing and bronchospasm during placement of LMA under thiopentone anaesthesia could be devastating in certain cases such as hypertension and Ischemic heart disease patients [6].

A number of techniques have been used to attenuate the haemodynamic responses occurring during pharyngeal instrumentation including deepening of anaesthesia with volatile agents, narcotics, beta blockers, nitropruside and lignocaine [7]. Lignocaine because of its ability to suppress upper airway reflexes has been used by many to attenuate the pharyngeal responses to intubations. Intravenous lignocaine 1-2mg/kg body wt. has been used for the depression of laryngeal and tracheal reflexes.

The objective of study was to assess whether intravenous lignocaine facilitates the placement of LMA under thiopentone sodium anaesthesia.

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PATIENTS AND METHODS

A double blind, prospective study of two groups was conducted to assess the action of intravenous lignocaine on suppression of upper airway reflexes for LMA placement. After approval of the study by the ethical committee of Combined Military Hospital Peshawar, 100 ASA I and II patients of either sex were selected and divided into two groups.

Group-I patients were given 2-4ml of normal saline while Group-II patients were given 1.5mg/kg of lignocaine 2% preservative free intravenously 90–120 seconds prior to induction. A senior Anaesthesiologist, blind to the patients grouping was present, observing the LMA placement and scoring the variables.

The statistical analysis was done using the statistical package for social sciences (SPSS Ver 10.0). Data of variables are presented as mean +/- standard deviation. Chi-square test is applied and statistical significance has been assumed when p value < 0.05.

RESULTS

Group – I: (n = 50) received I/V 3-4 ml of normal saline which served as control.

(34.6 + 9.8 yrs, 67.8 + 10.2 kg)

Group – II: (n = 50) received I/V lignocaine 1.5 mg/kg body wt. 2-3 min before induction. (35 + 10.1 yrs, 66.2 + 9.4 kg)

Following three variables were evaluated and recorded. (table):

- Jaw opening
- Cough reflex
- Ease of LMA placement

Results showed that the difference between two groups in Jaw opening is statistically insignificant ($p>0.05$). But the difference in cough reflex ($p<0.05$) and ease of placement ($p<0.05$) is statistically significant. It is clear from the tables that lignocaine showed better results than normal saline.

DISCUSSION

Laryngeal mask airway has rapidly secured its place in anaesthesia practice since its introduction in 1988. It has gained reputation all over the world and has established itself as a reliable mode of maintenance of airway in routine as well as in difficult circumstances. Its use has steadily increased in day care cases and up to 30 – 36 % of all day case surgery is being performed using LMA in UK [8].

Almost all induction agents have been successfully used for insertion of LMA, coughing, gagging and inadequate jaw relaxation makes placement of LMA difficult under intravenous thiopentone alone. Intravenous lignocaine has been used widely to attenuate the haemodynamic response to tracheal intubations and reflex bronchoconstriction due to instrumentation of the airway. The objective of my study was to assess whether intravenous lignocaine facilitates the placement of LMA under thiopentone sodium.

A double blind prospective study of 100 ASA I and II patients of either sex was carried out after approval. The patients were randomly divided into two groups. Group-I patients were given intravenous saline, while group-II patients received 1.5 mg/kg of lignocaine 2% prior to induction with a sleep dose of thiopentone (4 mg/kg)

Following three variables were observed:

- Jaw opening
- Cough reflex
- Ease of placement of LMA

The results of present study showed that intravenous lignocaine facilitate first attempt LMA placement in 60% of the patients accompanied by easy jaw opening in 58% of patients and devoid of cough in 62% of the patients ($P<0.05$)

Although studies have been done on all inducing agents for LMA placement, propofol is regarded by most anesthesiologists as the

drug of choice for induction of anaesthesia [9]. This phenol derivative has no effect on bronchial muscle tone and laryngospasm is particularly uncommon. The suppression of laryngeal reflexes results in a low incidence of coughing or laryngospasm when a laryngeal mask airway is introduced. The presser response to tracheal intubations is attenuated to a greater degree by propofol then thiopentone [10].

However, there have been reports of severe bradycardias and asystoles during or shortly after administration of propofol [11]. In healthy patients, arterial pressure decreases to a greater degree after induction of anaesthesia with propofol than with thiopentone, the reduction results predominantly from vasodilatation although there is a slight negative inotropic effect. In some patients, large decreases (>40%) (MAP 18+/- 1.4 mmHg) occurs [12-13]. Unless the drug is given very slowly, cardiovascular depression following bolus dose of propofol is greater than that associated with a bolus dose of barbiturate and is likely to cause profound hypotension in hypovolaemic or untreated hypertensive patients and in those with cardiac disease [14].

A number of techniques have been used to attenuate the haemodynamic responses occurring during pharyngeal instrumentation and intubations, such as deepening of anaesthesia with volatile agents [15], narcotic boluses (fentanil), beta blockers, nitropruside, calcium channel blockers, and lignocaine.

Lignocaine because of its ability to suppress the upper airway reflexes has been used by many to attenuate the pharyngeal response to intubations. Cocaine was the first agent to be used to suppress the laryngeal reflexes in general anaesthesia by Rosenberng in 1895 [16], and by Magill, to aid intubations in 1928 [17].

I/V lignocaine have been found to be effective in suppressing haemodynamic responses to laryngoscopy and intubations. Davidson and Gillespia (1993) studied effects

Table: Three variables; jaw opening, coughing and ease of placement.

Group	Jaw opening		
	Easy	Medium	Difficult
I-sal	15(30%)	15(30 %)	20(40 %)
Ii-lig	29(58 %)	11(22 %)	10(20 %)

P-value = 0.14

Group	Coughing		
	No cough	Slight	Gagging
I-sal	8(16 %)	19(10 %)	23(46 %)
Ii-lig	31(62 %)	16(32 %)	3(6 %)

P-value = 0.000002

Group	Ease of placement		
	Attempt	Attempts	Not placed
I-sal	10(20%)	20(40 %)	20(40 %)
Ii-lig	30(60 %)	13(26 %)	7(14 %)

P-value = 0.0033

of I/V lignocaine in 60 patients. They found that lignocaine I mg/kg I/V when administrated 2 min before induction improved intubation conditions from 20% to 79% [18].

Intravenous lignocaine is of great help in suppressing airway reflexes due to intubations of trachea in asthmatics. Lignocaine 1.5 mg/kg I/V, immediately before intubation is useful in preventing reflex bronchospasm due to instrumentation of the airway. Yokioka et al (1985) studied the effect of lignocaine in different doses to suppress the cough reflex during tracheal intubation. They found that administration of I/V lignocaine 1 mg/kg, 2 min before intubation significantly suppress cough reflex [19].

Lignocaine has been used for the depression of laryngeal and tracheal reflexes during intubation and extubation. It is commonly used to reduce the increase in intracranial pressure caused by laryngoscopy [20].

Lignocaine is of great help in reducing the haemodynamic responses to laryngoscopy and intubation in open globe injuries. It not only attenuates the increases in intraocular pressure due to intubation, but also has the effect on succinylcholine induced increases in IOP [21].

Lignocaine has been used to decrease the upper airway responses to extubation in ENT cases for a comfortable and smooth recovery. Its use has been increasing to suppress the postoperative cough and laryngospasm in tonsil surgery [22].

Muhammad Maroof and Colleagues and Paracha carried out similar studies on 40 patients. 20 patients were given saline while the other 20 got intravenous lignocaine before placement of LMA. The results were similar to my study with slight variation in the percentage of the variables [23-24].

A 4-10% incidence has been reported for failure to insert the LMA in first attempt. A similar number of patients may require readjustment of the device to get perfect seal. In my study, this percentage was a bit higher, but it was definitely better than the saline group. This number drops sharply with more experience, and some workers even report 100% success rate. The failure to correctly place LMA may be due to palatopharyngeal webs, down folding of the epiglottis, a size too small or too large and reduced mobility at the temporomandibular joint.

This was also noted in the study that coughing and gagging in the saline group occurred almost in 80% of the patient which is quite significant. Reaction to insertion may take several forms varying from slight swallowing movements to complete rejection. Swallowing is initiated by stimulation of numerous receptors in the membrane of the pharynx and larynx especially on the laryngeal aspect of the epiglottis. At the same there is reflex closure of the glottis. This reflex explains why premature insertion of LMA is often associated with complete inability to inflate lungs until the glottic sphincter relaxes normally after about 20 seconds.

Another important observation in the study was that the percentage of cough suppression with lignocaine was significantly more than the other variables (62%), which show that lignocaine has airway sedation property and ability to suppress the upper airway reflexes.

CONCLUSION

In this study three variables are studied i.e Jaw opening, Cough reflex, Ease of placement of LMA. On the basis of observations we can conclude that intravenous Lignocaine gives better results than normal saline.

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