

**TOPICAL LIGNOCAINE AND INTRAVENOUS SODIUM THIOPENTONE FOR INSERTION OF PROSEAL LMA, A COMPARISON WITH PROPOFOL**Mohammad Sadiq Malla<sup>1</sup>, Syed Mohammad Shahid<sup>2</sup>, Sameena Ashraf<sup>3</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT: BACKGROUND AND OBJECTIVE:** Propofol is the most common induction agent for LMA insertion. Sodium thiopentone alone doesn't suppress airway reflexes adequately. So this study was designed to assess whether application of topical lignocaine prior to sodium thiopentone administration would produce LMA insertion conditions as good as propofol. **METHODS:** one hundred patients of either sex in the age range of 16–60 years belonging to ASA I/II scheduled for open cholecystectomy were selected and allocated into one of the two groups. All patients received fentanyl intravenously 3 minutes before induction. Group IP received propofol 2.5mg/kg while as Group IIT received topical lignocaine and intravenous sodium thiopentone. Insertion conditions for Proseal LMA like gagging, coughing and laryngospasm were compared between the two groups. Duration of apnoea was also compared between two groups. **RESULTS:** There was no difference between two groups in gagging, coughing, laryngospasm. Number of attempts of Proseal LMA insertion and oxygen saturation were same between the two groups but the duration of apnoea was more in propofol than in topical lignocaine and sodium thiopentone group. **CONCLUSION:** Topical lignocaine and sodium thiopentone provided same insertion conditions for Proseal LMA as provided by propofol.

**KEYWORDS:** Propofol, Sodium thiopentone, Topical lignocaine, Proseal Laryngeal Mask Airway (pLMA), Fentanyl citrate, Laryngospasm.

**INTRODUCTION:** Many airway devices like facemasks, airways and endotracheal intubation are used for the management of airway. Endotracheal intubation is regarded as a gold standard technique for maintaining airway but this technique needs an expert for intubation and is associated with increased pressure response and postoperative complications like sorethroat.<sup>1</sup> Airway management has been revolutionized with new airway devices.<sup>2</sup> LMA is one of the new supraglottic airway devices used commonly to maintain airway. LMA is an alternative to endotracheal intubation and facemask for spontaneous as well as controlled positive pressure ventilation.<sup>3,4,5</sup> Compared to facemask, it provides better seal in edentulous patients or if the patient has beard. Besides it keeps anesthesiologists hands free, so fatigue is less and remote observation is possible.<sup>2,6</sup> LMA has become popular in airway management during elective anaesthesia and difficult airway situation as well as emergency situation<sup>7</sup>. Proseal LMA is a new Laryngeal Mask Airway with a modified double cuff and an esophageal drainage tube. It forms a more effective seal around and facilitated gastric tube placement for suction. These two features provide protection against aspiration.

Propofol is the most commonly used induction agent for insertion of LMA.<sup>8</sup> In the setting of day care anaesthesia with its emphasis on early ambulation, newer induction agent propofol with its short elimination<sup>9</sup> and rapid clearance was introduced. Comparison has therefore been made between propofol and other induction agents including sodium thiopentone for insertion of Proseal

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LMA.<sup>9</sup> These studies showed propofol to be a better agent causing less gagging, coughing and laryngospasm when compared to sodium thiopentone alone because latter doesn't suppress airway response to the same extent as the former. The present study was designed to assess whether application of topical lignocaine to pharynx prior to sodium thiopentone would allow insertion of Proseal LMA as easily as following propofol administration. This single blind prospective randomized study evaluated conditions obtained with topical lignocaine and sodium thiopentone for Proseal LMA insertion and compared them with propofol administration.

**MATERIAL AND METHODS:** With the approval of Hospital ethics Committee and informed consent of the patient, one hundred patients of either sex in the age range of 16 – 60 years belonging to ASA I/II scheduled for open cholecystectomy were selected and Proseal LMA was used for this study. Patients with gross obesity, severe hypertension, severe diabetes, ischemic heart diseases and history of allergy to thiopentone, lignocaine and propofol were excluded from this study. Patients were randomly allocated to one of the two groups.

**Group-I (P):** 50 patients received injection propofol 1% in the dose of 2.5mg/kg body weight intravenously over 30 seconds as induction agent.

**Group-II (T):** 50 patients received topical lignocaine (4sprays of lignocaine10%-out of 4 sprays of lignocaine, two were applied to each side of posterior pharynx).After 3minutes, these received intravenous sodium thiopentone (2.5%) in the dose of 5mg/kg body weight over 30 seconds as induction agent Multichannel monitor was attached and baseline parameters were recorded. 3 minutes before induction all patients received injection fentanyl 1µg/kg body weight intravenously. During these 3minutes patients were pre-oxygenated with 100% oxygen. Size of Proseal LMA was determined as per the weight of the patient. Once the patient was induced with one of the two techniques mentioned above, appropriate sized Proseal LMA was inserted by one of the anaesthesiologist who did not know the type induction techniques employed. The same anaesthesiologist noted the presence (grade I) or absence (grade 0) of coughing and laryngospasm while as gagging if occurred was graded as<sup>8</sup>;

**Grade 1:** No gagging.

**Grade 2:** Gagging settles spontaneously in less than 30s.

**Grade 3:** Requires a further dose of induction agent.

**Grade 4:** Requires Suxamethonium to allow ventilation.

Any patient not anaesthetized adequately enough to allow an attempt at insertion of Proseal LMA following initial dose of induction agent was graded as "2" and a further dose of induction agent was administered. Number of attempts required for successful insertion of Proseal LMA was recorded. Apnoeic time was also recorded. During this period patients lungs were not manually ventilated neither they received volatile anaesthetic agents nor nitrous oxide. Once the patient starts spontaneous respiration, non-depolarizing muscle relaxant was given and anaesthesia was maintained by oxygen and nitrous oxide (50%; 50%) with isoflourane (0.5-1%). After completion of surgery, neuromuscular block was reversed. Postoperative complications including sore throat were recorded. Statistical analysis; whole data by mean, percentage and standard deviation, other tests used were students ttest, Manyt-Whitney test, chi square, odds ratio.

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**RESULTS:** In our study there were no significant differences between the two groups with respect to age, sex, body weight and ASA status of the patient as shown in table 1 below.

	<b>G I(P)</b>	<b>G II(T)</b>
Age (years)	45 ±9.5	43± 9
Sex (M:F)	82:18	80:20
Body (Weight)	54.8±6.2	53.8±5.7
ASA (I: II)	88:12	88:12

**Table 1: Comparison of demographic parameters between the groups**

Other parameters like gagging, coughing, laryngospasm and number of Proseal LMA insertion attempts were compared between two induction regimens. In Group IP gagging was absent in 34 patients (68%) and present in 16 patients (32%) while in Group IIT gagging was absent in 32 patients (64%) and present in 18 patients (36%). When these results were statistically compared and the result obtained was insignificant ( $P>0.05$ ) as shown in table 2.

<b>Gagging</b>	<b>G-I(P)</b>	<b>G-II(T)</b>
No GO	68%	64%
Yes GI:GII	12:20	20:16

**Table 2: Comparison of gagging between the groups**

In Group IP coughing was absent in 48 patients (96%) and present in 2 patients (4%) while as in Group IIT coughing was absent in 47 patients (94%) and present in 3 patients (6%) when these values were statistically compared and the result obtained was not significant ( $P>0.05$ ). In Group IP Laryngospasm was absent in 49 patients (98%) and present in 1 patient (2%) while as in Group IIT laryngospasm was absent in 49 patients (98%) and present in 1 patient (2%) when these values were statistically compared and the results obtained was insignificant ( $P>0.05$ ).

The mean duration of apnoea in Group IP was  $108 \pm 15.1$  and in Group IIT was  $74.4 \pm 10.1$ . These values were statically compared and the result obtained was significant ( $P<0.05$ ). In Group IP Proseal LMA was inserted in its attempt in 86% of patients and in second attempt in 14% of patients while in Group IIT Proseal LMA was inserted in its attempt in 86% of patients and in second attempt in 14% of patients. These results were statistically compared and found insignificant ( $p>0.05$ ). Intraoperative course of all patients remained uneventful. Oxygen saturation ( $SpO_2$ ) between two groups remained 99-100% and difference between two groups was statistically insignificant. All patients completed the study. Postoperative period patients remained without complications except some patients developed sore throat which was statistically insignificant between two groups ( $p>0.05$ ).

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	G-I(P)	G-II(T)
Coughing GO:GI	96:4	94:6
Laryngospasm GO:GI	98:2	98:2
Apnoea time	108±15.1	74±10.1
No of attempts of P LMA insertion 1:2	86:14	86:14
Intraoperative course	Uneventful	Uneventful

**Table 3: Comparison of different parameters to see ease of insertion for LMA insertion between the groups**

**DISCUSSION:** Insertion of Proseal LMA needs abolition of airway reflexes like gagging, coughing and laryngospasm. This is most commonly achieved by using propofol as an induction agent. But this drug is costlier one and is not available in all countries. Besides this, the drug also causes haemodynamic instability. These things make one to assess and think for an alternative induction agent. Many induction agents have been used for this purpose but the conditions achieved were not satisfactory,<sup>9,10</sup> as compared to propofol. The reason being that propofol suppresses airway reflexes more effectively as compared to sodium thiopentone. Topical lignocaine administered to the posterior oropharynx prior to sodium thiopentone may therefore be expected to produce conditions equal to those of propofol for insertion of LMA.

In our study Incidence of gagging between two groups was statistically insignificant ( $p>0.05$ ). Some patients in both groups which showed gagging received further dose of same induction agent. Gagging occurred in a small number of patients in both groups due to inadequate suppression of airway reflexes. Insertion of Proseal LMA caused stimulation of pharynx under lighter planes of anaesthesia which resulted in gagging. C. R. Seavell, et al<sup>8</sup> in 1996 and M. S. Chan<sup>11</sup> 1993 carried a similar study and found that incidence of gagging was same in both groups. However our results are not in accordance with Patrick and Scanlon et al<sup>9</sup> 1993 who did not use topical lignocaine and found incidence of gagging more in thiopentone group as compared to propofol group. Coughing was absent in most of the patients in both the groups. However, incidence of coughing in Group IP was 4% and in Group IIT was 6%, which was statistically insignificant. Our study is in accordance with the study of C. R. Seavell et al<sup>8</sup> in 1996. Patrick and Scanlon<sup>9</sup> showed similar results in their study. Our results are not in accordance with N. Mackenzie<sup>12</sup> in 1985 who found higher incidence of coughing in thiopentone group as compared to propofol. This was because of inadequate suppression of airway reflexes. Laryngospasm was almost absent in both the groups except one in each group, which got relieved of its own after sometime. Our results are similar to C. R. Seavell et al<sup>8</sup> study.

Duration of apnoea was more in propofol Group (108sec) as compared to Thiopentone Group (74 sec) and difference between two groups was statistically significant. C. R. Seavell et al<sup>8</sup> found a mean duration of apnoea of 103sec in propofol group as compared to 65.4sec in thiopentone group. Propofol is a potent respiratory depressant. Proseal LMA was inserted in both groups on the 1<sup>st</sup> attempt in most of patients. 7 patients out of 50 in each group needed 2<sup>nd</sup> attempt for successful insertion of LMA. C. R. Seavell<sup>8</sup> found that LMA was inserted in 1<sup>st</sup> attempt in all patients successfully. Only 5 out of 44 in propofol group and 4 out of 46 in Thiopentone group needed 2<sup>nd</sup> attempt for insertion of LMA. No patient had a fall in oxygen saturation while inserting pLMA. The finding of less respiratory depression with thiopentone is well documented. Topical lignocaine suppresses airway

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reflexes as well cardiovascular responses. The dose of lignocaine that we employed was 40mg which is well below the toxic dose.

**CONCLUSION:** In conclusion, we have shown that if 40mg of topical lignocaine is sprayed onto posterior pharyngeal wall 3minute before induction of anaesthesia with thiopentone, the conditions for insertion of Proseal LMA are equal to those following an equipotent dose of propofol but with less apnoea and significantly less respiratory depression.

### BIBLIOGRAPHY:

1. Giriesh P. Joshi, Yoshmiinagaki, Paul F. White, Lissa Taylor Kennedy, Linda I. Wat, Clifford Gevirtz, John. M. McCrany. Use of laryngeal mask airway as an alternative to the tracheal tube during ambulatory anaesthesia. *Anaesthesia Analgesia*, 1997; 85, 573-7.
2. A.I.J Brain, T.D Mcghee, A. Thomas, M. A. W. Abusaad, J. A. Bushmal. The Laryngeal Mask Airway-Development and Preliminary trials of a new type airway. *Anaesthesia*, 1985; 40, 356-361.
3. A.I.J Brain the Laryngeal Mask –a new concept in airway management *Br. J. Anaesthesia* 1983, 55; 801-805.
4. Joseph A. Fisher, Chodambaram Ananthnarayn Gerald Edelist. Role of the laryngeal mask airway management. *Canadian Journal Anaesthesia*, 1992; 39(1) 1-3.
5. Pramood P. Bapat, and and Chandy Verghese. Laryngeal Mask Airway and the incidence of regurgitation during gynaecological laproscopies. *Anaesth Analg* 1997; 85; 139-43.
6. Ian Smith, Paul F. White. Use of Laryngeal Mask Airway as an alternative to a facemask during out-patient Arthroscopy. *Anaesthesiology*, 77; 850-855, 1992.
7. Bimla Sharma, P.M.Baily. LMA in present day anaesthesia *Journal of Anesthesiology Clinic Pharmacology* 2007, 23(1); 5-15.
8. C. R. Seavell, T. M. Cook. Topical lignocaine and sodium thiopentone for the insertion of LMA, a comparison with propofol. *Anaesthesia* 1996; 51, 699-701.
9. Patrick Scanlon, Michael Carey, Micheal Power. Patient response to Laryngeal Mask Airway insertion after induction with Propofol or Thiopentone. *Canadian J. Anaesthesia* 1993, 40(9); 816-8.
10. Brown. J. W, Patel, Ellis F.R Comparison of propofol and sodium thiopentone for Laryngeal Mask Airway insertion. *European Jour. Anaesthesiology* 1986 vol. 3, 11-14.
11. M. S. Chan, K. S. Mui, A. F. Khan. Insertion of LMA, Thiopentone with topical lignocaine. *Anaesthesia and intensive care*. Vol. 21. No1 February 1993.
12. N. Meckenzie, I. S. Grant. Comparison of the new emulsion formulation with methohexitone and thiopentone for induction pf anaesthesia in day cases. *Br. J. Anaesthesia* 1985, 57; 725-731.

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