Section: Anesthesia

Original Research Article

COMPARATIVE EVALUATION OF TOPICAL AND INTRAVENOUS LIGNOCAINE FOR INSERTION OF LARYNGEAL MASK AIRWAY WITH PROPOFOL

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Abstract

Background: Aims: The aim of this randomized prospective study is to compare the efficacy of topical and intravenous Lignocaine for the insertion of laryngeal mask airway, with Propofol. **Materials and Methods:** It is randomized prospective study in 60 un-premedicated patients between the ages 16 and 45 years, including both the sexes, ASA Grade 1 and 2 who were undergoing elective surgeries. Group I: (n=30) Patients receiving 1.5 mg/kg IV Lignocaine over 30 seconds (30 seconds prior to injection Propofol). Group II: (n=30) Patients receiving 40 mg lignocaine aerosol given topically (4 sprays of lignocaine 10% spray, 10mg/ spray, used 3 minutes prior to injection propofol at interval 30 sec each). **Result:** 2 groups are demographically identical. Ease of insertion was excellent in 20 (66.7%) patients in group 1 and 25 (83.3%) patients in group 2. Poor conditions for insertion were seen in 3 (10%) patients in group 1 and 2 (6.7%) patients in group 2. Mean Heart rate in both the groups increased significantly post induction at 30 seconds and decreased thereafter at 1, 2 and 3 minutes. At 3 minutes heart rate reached similar to baseline. Mean SBP in both the groups decreased significantly post induction at 30 seconds and decreased thereafter at 1, 2 and 3 minutes. At 3 minutes SBP reached similar to baseline. Mean DBP in both the groups decreased significantly post induction at 30 seconds and increased thereafter at 1, 2 and 3 minutes. At 3 minutes DBP reached similar to baseline. **Conclusion:** Topical Lignocaine prior to Propofol induction provides excellent conditions for LMA insertion without the use of neuromuscular blockages.

INTRODUCTION

Airway management is one of the most important skills in the field of anaesthesiology and inability to secure the airway can lead to cataclysmic results. Before 1990, only face mask and the endotracheal tube (ETT) were the available airway devices. Since then, several supraglottic airway devices have been developed, among which the laryngeal mask airway (LMA), which was introduced in 1991, is the most popular and widely used device.[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 anaesthesiologists hands free.[2] The laryngeal mask airway has been widely used as an alternative to the face mask and oropharyngeal airway, and in some cases, to tracheal intubation, especially for ambulatory anaesthesia as it is less invasive compared to endotracheal intubation and causes less postoperative discomfort.2 Traditionally, LMA insertion is done with the help of NM blocking drugs which cause full skeletal muscle relaxation. The use of succinylcholine is associated with unpleasant muscle pains and it is particularly desirable to avoid this in day care anesthesia. LMA insertion has been revolutionized with the development of induction agents like propofol and ultra-short acting opioids like remifentanyl which provide excellent conditions for LMA insertion.[3] Among induction agents, propofol is often used to facilitate LMA insertion because it depresses airway reflexes effectively and makes early recoverypossible.4 A propofol dose ranging from 2.5 to 3 mg/kg-1 is recommended for LMA insertion, but insertion of the device is not always smooth in unpremedicated patients. Larger doses of propofol carry the risk of cardiorespiratory depression. Furthermore, it has been shown that propofol, when used as an induction agent, provides better LMA insertion conditions than thiopental,

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because it better relaxes the jaw and has a greater depressant effect on airway reflexes.2,3 Patient response to LMA insertion during propofol induction, however, depends on many factors, such as the method of administration used dose, speed of injection, and the use of adjuvant drugs such time elapsed after propofol administration, and propofol plasma and effect-site concentrations at the time of LMA insertion.[5] In an effort to improve the insertion conditions without increasing the dose of propofol, short-acting opioids, muscle relaxants, or midazolam may be co-administered with propofol to facilitate LMA insertion. Intravenous lidocaine is known to suppress cough reflexes and reduce cardiovascular responses associated with tracheal intubation. Its use prior to induction has been reported to improve LMA insertion conditions, but not to reduce propofol requirements. Compared with lidocaine 1.5 mg.kg-1 iv, the spraying of topical lidocaine 40 mg over the posterior pharyngeal wall has been shown to result in fewer airway incidents and LMA insertion failures in patients receiving thiopental as the induction agent. The finding led us to hypothesize that the application of topical lidocaine might effectively reduce the dose of propofol required for smooth LMA insertion. In the previous studies, Lidocaine has been used both topically and intravenously to reduce cardiovascular responses, coughing, and bucking associated with tracheal intubation, because of its dose-dependent cough-suppressing effect. 3,4These studies reported contradicting results. Therefore, the present study was undertaken to compare topical lignocaine and intravenous lignocaine for insertion of laryngeal mask airway with propofol.

MATERIALS AND METHODS

The present study is designed as a randomized prospective study. The study was approved by Institutional ethical committee of Gandhi Medical College, Secunderabad. The study subjects were 60 un-premedicated patients between the ages 16 and 45 years, including both the sexes, ASA Grade 1 and 2 who were undergoing elective surgeries.

Inclusion Criteria

Patients aged between 16 and 45 years, belonging to ASA grade I or II scheduled for elective surgeries.

Exclusion Criteria

Allergy to any of the drugs used in the study, Patient's with anticipated difficult airway, Patient's with a history of coronary artery disease, hypertension, endocrinal disorder, metabolic disease, respiratory disease.

Patients with a history of coronary artery disease, hypertension, endocrinal disorder, metabolic disease, respiratory disease, allergic history or anticipated difficult airway were excluded from the study. Study subjects were then randomly allocated into two groups:

Group I: (n=30) Patients receiving 1.5 mg/kg IV Lignocaine over 30 seconds (30 seconds prior to injection Propofol).

Group II: (n=30) Patients receiving 40 mg lignocaine aerosol given topically (4 sprays of lignocaine 10% spray, 10mg/ spray, used 3 minutes prior to injection propofol at interval 30 sec each).

Written and well informed consent was taken prior to the onset on the study. In all the patients, a detailed pre-anaesthetic examination was conducted with routine investigations for urine, haemoglobin%, TLC, blood urea, blood sugar and serum electrolytes. Baseline chest X-ray and ECG were also taken.

After shifting the patient to operation theatre, IV line was set up and basic monitors were applied. After stabilizing the subject for 5 minutes, basic parameters were recorded. In Group I after preoxygenation with 100% oxygen for 3 minutes, IV lignocaine 1.5mg/kg over 30 seconds was given followed by inj. propofol 2mg/kg. LMA insertion was attempted by using standard technique.

In Group II after preoxygenation with 100% oxygen for 3 minutes lignocaine aerosol was spread to posterior pharyngeal wall, and its either sides (total 4 sprays, 10mg/spray) followed by inj. Propofol 2mg/kg and LMA insertion after 30 seconds of propofol and conditions for LMA insertion and vital parameters were recorded.

Grades of gagging

Grade 0- No Gagging,

Grade 1- Gagging settled within 30 seconds,

Grade 2-a further dose of induction agent required,

Grade3 -Suxamethonium was required

ECG, NIBP, SPO2 and ETCO2 were recorded according to pre-scheduled time periods as described below:

T0 Base line reading

T1 Thirty seconds after induction with Propofol, post LMA insertion

T2 One minute

T3 Two minutes

T4 Three minutes

Patient's lungs were not manually ventilated and they did not receive volatile agents or nitrous oxide before the first set of readings was taken post LMA insertion. During recording of second and third minute patients were started on nitrous oxide (66% in O2) and vecuronium in dose of 0.1mg/kg after proper LMA confirmation. Further anaesthesia was maintained with standard protocol for general anaesthesia as per surgery. Continuous monitoring of ECG, HR, BP, SPO2, ETCO2 were done at every 5 minute intervals. Statistical analysis was performed using paired t-test. Categorical data was analyzed using chi-square test. A p-value of <0.05 was accepted as statistically significant.

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RESULTS

Table 1: Age and gender distribution of patients

Age Distribution	Group 1	Group 2	Total
16-25 Years	6 (20%)	5(13.3%)	11
26-35 Years	17 (56.7%)	8 (26.7%)	25
36-45 Years	7 (23.3%)	18 (60%)	25
Total	30 (100%)	30 (100%)	60
Gender			
Male	21 (70%)	22 (73.3%)	43
Female	9 (30%)	8 (26.7%)	17

Out of 60 patients, majority of patients in group 1 were 26-35-year-old (56.7%), while in group 2, most of the patients were in the 36-45-year age group (60%). This result was statistically significant ($p \leq 0.05$). Shows that the number of males was higher in both Group 1 and group 2 (70% and 73.3%) compared to females. But this finding was not statistically significant. Thus 2 groups are identical with respect to gender. Hence the 2 groups are demographically identical.

Table 2: Distribution of patients in relation to incidence of coughing

Coughing	Group 1	Group 2
None	27 (90%)	29 (96.7%)
Mild	3 (10%)	1 (3.3%)
Moderate	0	0
Severe	0	0
Total	30 (100%)	30 (100%)

In Group 1, 27 (90%) patients had no coughing and 10% had mild grade of coughing, while in Group 2, 29 (96.7%) patients had no coughing response and only 1 (3.3%) patient had mild grade of coughing. This observation was found to be statistically significant (p=0.03).

Table 3: Distribution of patients in relation to incidence of gagging

Gagging	Group 1	Group 2
Absent	23 (76.7%)	27 (90%)
<30 sec	3 (10%)	2 (6.7%)
Propofol required	4 (13.3%)	1(3.3%)
Succinyl choline required	0 (0%)	0 (0%)
Total	30 (100%)	30 (100%)

In Group 1, 23 (76.7%) patients had no gaggig and 3 patients (10%) had gagging for <3sec, while in Group 2, 27 (90%) had no gagging response and only 2 (6.7%) patients had gagging for <3sec, while 4 patients (13.3%) in group 1 and 1 patient (3.3%) in group 2 required propofol. This observation was found to be statistically significant (p=<0.001).

Table 4: Distribution of patients in relation to incidence of Laryngospasm

Laryngospasm	Group 1	Group 2
None	27 (90%)	29 (96.7%)
Mild	3 (10%)	1 (3.3%)
Moderate	0 (0%)	0 (0%)
Severe	0 (0%)	0 (0%)
Total	30 (100%)	30 (100%)

p=0.04

27 (90%) patients in Group 1, and 29 (96.7%) patients in group 2 had no laryngospasm, while 3 (10%) patients in group 1 and 1 (3.3%) patient in group 2 had mild laryngospasm. This observation was found to be statistically significant (p=0.04).

Table 5: Distribution of patients according to Ease of insertion

Ease of Insertion	Group 1	Group 2
Excellent	20 (66.7%)	25 (83.3%)
Good	5 (16.7%)	3 (10%)
Poor	3 (10%)	2 (6.7%)
Unacceptable	2 (6.7%)	0 (0%)
Total	30 (100%)	30 (100%)

p=0.02

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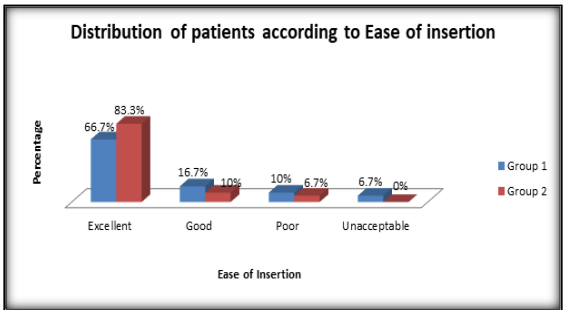

Figure 1: Distribution of patients according to Ease of insertion

Ease of insertion was excellent in 20 (66.7%) patients in group 1 and 25 (83.3%) patients in group 2. Poor conditions for insertion were seen in 3 (10%) patients in group 1 and 2 (6.7%) patients in group 2. This observation was found to be statistically significant (p=0.02).

Table 6: Comparison of Airway condition parameters

Parameter	Group 1	Group 2	P-Value	Inference
Incidence of coughing	10%	3.3%	0.03	Significant
Incidence of gagging	23.3%	10%	<0.001	Significant
Incidence of Laryngospasm	10%	3.3%	0.04	Significant
Ease of insertion	83.4%	93.3%	0.02	Significant
No. of attempts	1.23	1.06	<0.001	Significant

24 (80%) patients in group 1 and 28 (93.3%) patients in group 2 required one attempt, while 5 (16.7%) patients in group 1 and 2 (6.7%) in group 2 required 2 attempts. Only 1 (3.3%) patients in group 1 and none in group 2 required more than 2 attempts. This observation was found to be statistically significant (p<0.001).

Table 7: Haemodynamic Parameters

Parameter	Group 1					Group 2					P-Value	Inference
	Base line	30 Sec	1Min	2min	3min	Base line	30 Sec	1Min	2min	3min		
Heart rate	87.9	97.6	92.9	89.8	88.1	85.6	95.5	91.3	89.8	86.8	>0.05	Insignificant
SBP	128	117	128	127	127	128	119	125	125	125	>0.05	Insignificant
DBP	81.93	72.73	79.63	78.97	77.80	76.63	71.67	77.47	76.50	75.23	>0.05	Insignificant
MAP	97.10	87.93	95.10	94.73	93.89	94.47	87.57	92.70	91.00	92.87	>0.05	Insignificant

Mean Heart rate in both the groups increased significantly post induction at 30 seconds and decreased thereafter at 1, 2 and 3 minutes. At 3 minutes heart rate reached similar to baseline. These findings were not significant (p>0.05). Mean SBP in both the groups decreased significantly post induction at 30 seconds and decreased thereafter at 1, 2 and 3 minutes. At 3 minutes SBP reached similar to baseline. These findings were significant (p<0.05). Mean DBP in both the groups decreased significantly post induction at 30 seconds and increased thereafter at 1, 2 and 3 minutes. At 3 minutes DBP reached similar to baseline. These findings were not significant (p>0.05). MAP in both the groups decreased significantly post induction at 30 seconds and increased thereafter at 1, 2 and 3 minutes. At 3 minutes MAP reached similar to baseline. These findings were not significant (p>0.05).

DISCUSSION

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. The laryngeal mask airway (LMA) has been used successfully as both a ventilatory device and a conduit for tracheal intubation.[6] To avoid gagging, coughing and laryngospasm, the LMA insertion requires the suppression of upper airway reflexes. Various IV induction agents were used for LMA insertion.[5] For the injection of an LMA, thiopentone has been tried but produces conditions less satisfactory than propofol.[2,4] Propofol is known to effectively suppress both pharyngeal and laryngeal reflexes than thiopentone. However, studies indicate a 38 - 60 percent occurrence of inadequate insertion with normal induction doses of propofol (2 - 3 mg / kg) associated with side effects such as swallowing, gagging, coughing, limb movement and haemodynamic instability if an excess dose of propofol is used. It has been shown that lignocaine suppresses cough and is reliant on the dosage. When used topically or intravenously, lignocaine often decreases the cardiovascular response to tracheal intubation and LMA insertion.[7] The hemodynamic responses to LMA insertion are negligible which rarely requires intervention. Topical lignocaine has a therapeutic effect for 20 - 40 minutes and by the time of recovery its local anaesthetic activity would be abolished. In this study, we compared the airway conditions for LMA insertion provided by topical lignocaine or IV lignocaine before induction with propofol and haemodynamics before insertion and for 3 min after insertion in both the groups. Both groups were comparable with regards to mean age, gender distribution, body weight and surgical

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procedures. In the present study, no coughing was observed in 27 and 29 patients in group 1 and 2 respectively, while mild coughing was observed in only 1 patient in group 2 and 3 patient in group 1 had mild coughing. Similar result was observed in relation to laryngospasm. Gagging for less than 30 seconds was observed in 3 patients in group 1 and 2 patients in group 2. Propofol was required in 4 patients in group 1, while in group 2 only 1 patient in group 2 needed propofol. None of the patients in either groups had moderate/severe coughing, gagging or laryngospasm. In Group1, the LMA was inserted in first attempt in 24 patients and in second attempt in 5 patients. In Group 2, LMA was inserted in first attempt in 28 patients and in second attempt in 2 patients. Only one patient in group 1 required more than 2 attempts in our study for LMA insertion which indicates the facilitation of ease of insertion by the drugs studied. Number of attempts to pass the LMA in Group 2 compared to Group 1, was also significantly less. This was possibly due to airway reflex suppression by the topical lignocaine applied to the pharyngeal posterior wall. In Group 1, mild laryngospasm occurred in 3 patients compared to 2 patients in group 2. None of the patients in either group had Grade 3 gagging, coughing or laryngospasm during LMA insertion. In the present study, we found that LMA insertion conditions were better when topical lignocaine was sprayed onto the posterior pharyngeal wall (Group 2) with fewer occurrences of gagging and coughing. It provided excellent insertion conditions for LMA and to protect the patient's airway with LMA more efficiently. These findings were consistent with that reported by Cook and Seavell et al8., Ahmed S et al9. In both cases, the baseline heart rate was comparable. The mean heart rate increased significantly ($P < 0.05$) in both groups, post induction (T0 - T1: 9.7 in Group I, 9.9 in Group 2). This rise was similar in both groups ($P<0.05$). Post insertion of LMA in 1 min. Further rise in heart rate (T0 - T2: 5.0 in Group1, 5.7 in Group 2), which was a relative rise in Group II. In both groups at two and three minutes, the heart rate decreased after LMA insertion and achieved a level equal to the baseline. LMA insertion triggers the pressor response which increases HR, SBP and DBP. In a similar study by were reported in the studies done by Ahmed S et al.[9] and Reddy GS et al10 in which it was observed that there was a significant rise in mean heart rate post induction in both groups. At two and three minutes post LMA insertion heart rate remained slightly high from baseline but was not significant. In both classes, there was a reduction in SBP after induction. In individual classes, it was significant ($P < 0.05$) but changes were not significant when compared to both classes. The SBP increased post insertion of LMA in both, however it was not important relative to the baseline. Cook and Seveall et al8. observed that there was no substantial difference in SBP (IV lignocaine VS topical) post LMA insertion lignocaine. Study by Jain N et al9 also reported that, post induction there was a fall in SBP, DBP and MAP in both the groups which was significant in individual groups ($p<0.05$) but when compared in between both groups, changes were not significant. Post insertion of LMA the blood pressure increased but was not significant as compared to baseline in both the groups. There was a substantial decrease in the DBP after induction, ($P < 0.05$) at 30 seconds post insertion of LMA (T0 - T1: 9.3; 4.36 in Group 1 and Group 2 respectively). DBP increased after LMA insertion, but it was non-significant at 2 and 3 minutes post insertion compared to the baseline. Similar result was reported in the study done by Ahmed S et al.[9] that, after LMA insertion DBP increased but was not significant compared to baseline. Jain N et al38 reported that, post induction there was a fall in SBP, DBP and MAP in both the groups which was significant in individual groups but when compared in between both groups, changes were not significant. In the study done by Reddy S et al.[10] there was a substantial decrease in the DBP after induction, ($P < 0.05$) of the individual groups, which was comparable in both groups. DBP increased after LMA insertion, but it was non-significant relative to the baseline. The MAP decreased to a substantial level after induction. In both groups (T0 - T1:9.34+ in group 1, 9.17 and 6.9 in group 2), MAP was increased in both groups, one-minute after insertion of LMA but that was not significant. ($P > 0.05$) (T0 - T2: 2 in group 1 and 1.77 in group 2). Similarly, at 2 and 3 minutes, the change in MAP compared to baseline was not significant ($P > 0.05$) between the two classes. This finding could be a result of attenuated pressor response to LMA and lignocaine. These finding was similar to that of Forest and Wood et al.[11] Similarly, Ahmed S et al.[9] Reddy S et al.[10] reported that even though MAP decreased post induction and increased there after till 3 minutes post insertion, the result was not significant when compared between both groups. In a similar study by Rao H M et al.[12] airway conditions for LMA insertion and haemodynamic stability provided by 2% lignocaine viscous gargling were compared with IV lignocaine given before propofol (and fentanyl) induction. It was observed that, here was a significant fall in SBP, DBP and mean arterial blood pressure, 1 min after insertion of LMA through to 3 min after insertion within each group from baseline values (P value <0.01). Bhandari G et al.[13] conducted a study to assess the efficacy of topical and intravenous lidocaine prior to intravenous thiopentone in providing good conditions for LMA insertion. There was significant increase in heart rate and fall in SBP, DBP and MAP after induction ($p<0.05$). Post LMA insertion heart rate further increased at 1 minute and returned to the baseline rate at 2 and 3 minutes in both the groups. Post LMA insertion the SBP, DBP and MAP at 1, 2 and 3 minutes did not attain significant change from baseline in both the groups. Inter group comparison of heart rate, SBP, DBP and MAP at 1

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min, 2 min and 3 min after LMA insertion showed no difference between the two groups.

Limitations

- The major limitation of our study was that, all the age groups received equal dose i.e. 3 sprays of 10% lignocaine, irrespective of their age and weight.
- Plasma levels of lignocaine was not measured in our study.
- The other limitation was that the LMA was inflated with the prescribed volume of air and air leak was checked clinically. No aneroid cuff manometer was used to measure the cuff pressure

CONCLUSION

In conclusion, the current research shows that topical lignocaine when sprayed onto the back of the pharyngeal wall 3 minutes prior to propofol induction, provide excellent conditions for LMA insertion, without administering the neuromuscular blockers. It was observed that in group of topical lignocaine no of attempts for LMA insertion was significantly less. Even after the LMA was introduced, changes were insignificant. In HR, SBP, DBP and MAP. We therefore conclude that greater insertion conditions are provided by topical lignocaine. But with IV lignocaine hemodynamics' stability is the same as topical lignocaine.

REFERENCES

1. Simon LV, Torp KD. Laryngeal Mask Airway. [Updated 2022 Jul 25]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK482184/
2. Gil Gavel, FRCA, Robert WM Walker, FRCA, Laryngospasm in anaesthesia, Continuing Education in Anaesthesia Critical Care & Pain, 2014: Volume 14, Issue 2, Pages 47–51,
3. Zaballos M, Bastida E, Agustí S, Portas M, Jiménez C, López-Gil M. Effect-site concentration of propofol required for LMA-Supreme™ insertion with and without remifentanil: a randomized controlled trial. BMC Anesthesiol. 2015 Oct 6;15:131.
4. Ashay NA, Wasim S, Anil TB. Propofol requirement for insertion of I-gel versus laryngeal mask airway: A comparative dose finding study using Dixon's up-and-down method. J Anaesthesiol Clin Pharmacol. 2015 Jul-Sep;31(3):324-8.
5. Gopinath MV, Ravishankar M, Nag K, Kumar VH, Velraj J, Parthasarathy S. Estimation of effect-site concentration of propofol for laryngeal mask airway insertion using fentanyl or morphine as adjuvant. Indian J Anaesth. 2015 May;59(5):295-9.
6. Dimitriou V, Voyagis GS. Use of the intubating laryngeal mask for airway management and light-guided tracheal intubation in the lateral position. Eur J Anaesthesiol. 2000;17:395–397.
7. Belete E, W/Yahones M, Aweke Z, Dendir G, Mola S, Neme D, Melaku G, Ahmed S, Regasa T, Tesfaye B. Comparison of thiopentone with lidocaine spray vs propofol for laryngeal mask airway insertion at tikur anbessa specialized hospital. A prospective cohort study. Ann Med Surg (Lond). 2021 Jun 2;66:102436.
8. Seavell CR, Cook TM, Cox CM.Topical lignocaine and thiopentone for the insertion of a laryngeal mask airway. Anaesthesia.1996;51:699-701.
9. AhmedS, JainN, SaksenaS.Comparative evaluation of topical and intravenous lignocaine for insertion of laryngeal mask airway with propofol. Int J Adv Med 2018;5:573-7.
10. Reddy, G. Swathi, and Karuna Taksande. "Comparative Evaluation of Topical Lignocaine Versus Intravenous Lignocaine for Laryngeal Mask Airway Insertion in Wardha, Maharashtra." Journal of Evolution of Medical and Dental Sciences, vol. 10, no. 28, 12 July 2021, pp. 2078+. Gale OneFile: Health and Medicine, link.gale.com/apps/doc/A670013091/HRCA?u=anon~49386faf&sid=googleScholar&xid=fa7a0cf2. Accessed 7 Jan. 2023.
11. Wood ML, Forrest ET. The haemodynamic response to the insertion of the laryngeal mask airway: a comparison with laryngoscopy and tracheal intubation. ActaAnaesthesiol Scandinavica.1994;38:510-3.
12. Rao M H, Chaitanya J, Subhadra PJ. Comparative evaluation of 2% lignocaine viscous gargling and intravenous lignocaine for insertion of laryngeal mask airway. J Clin Sci Res 2020;9:31-6
13. Geeta Bhandari, Rajendra K. Singh, Poonam Bhadoria : Comparative Evaluation of Topical and Intravenous Lidocaine for Insertion of Laryngeal Mask Airway with Thiopentone. J Anaesth Clin Pharmacol 2006; 22(4) : 383-386 383.

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