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Original Research Article

"A Observational study of ease of insertion, hemodynamic changes and postoperative adverse events between classical laryngeal mask airway and i gel in short surgical procedures"

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ABSTRACT

BACKGROUND: Observational study ''Ease of insertion, hemodynamic changes and postoperative adverse events'' between C-LMA and I-Gel in short surgical procedures.

METHODS: Sixty patients of age between 18-50 years of ASA grade I and grade II who were posted for short surgical procedures under general anesthesia were included in the study. Patients were divided into two groups: Group I: I-Gel: n-30 Group II: C-LMA: n-30 .All the patients were induced with propofol 2-3mg/kg.

RESULTS: comparison of ease of insertion and Insertion in first attempt was successful in 93.3% of patients in group I (I-GEL) as compared to 66.7% of Group II (C-LMA). Time required for insertion was 17.73±5.29s for group-I(I-Gel) as compared to 26.33±5.45s of group II(C-LMA) and a higher incidence of postoperative adverse events group II (C-LMA) than in Group I (I-Gel).C-LMA and I-Gel have similar hemodynamic changes.

CONCLUSION: In our study we concluded that I-Gel devices are easy to insert, in less no. Of attempts, requiring less time of insertion and less post-operative adverse events as compare to C-LMA. Classical -LMA and I-Gel have similar hemodynamic.

Keywords; C-LMA- classical laryngeal mask airway**,** SAD- Supraglottic airway devices

1. INTRODUCTION

- Securing the airway during conduction of anaesthesia is one of the important part of ventilation.
- Friedrich Von Esmarch proved that in some cases of airway obstruction, jaw thrust is the life saving procedure .
- Procedures like laryngoscopy and endotracheal intubation causes reflex sympathetic stimulation which results in high levels of catecholamines which in turn causes increase in heart rate, blood pressure, cardiac contractibility, risk of myocardial infarction and ventricular arrhythmias .

AIMS AND OBJECTIVE

- This study was a observational hospital based study with the following objectives

ISSN: 0975-3583,0976-2833 VOL12, ISSUE7, 2021

PRIMARY OBJECTIVE:

- The main aim of this study is to compare the two supraglottic airway devices, Classical LMA and I Gel in short surgical procedures. Besides this -
- To compare the ease of insertion.
- To compare number of attempts.
- To compare hemodynamic changes during insertion & intra-operative period,

SECONDARY OBJECTIVE:

- To compare postoperative adverse events like airway trauma, blood staining of device and incidence of complication like bronchospasm, laryngospasm, sore-throat, vomiting, regurgitation, hoarseness of voice.

2. METHODOLOGY

- **Inclusion Criteria-**
- patients of ASA Grade I and II.
- Age ranging from 18 to 50 years of both genders.
- patients scheduled for short surgical procedures in General Anaesthesia in supine position.
- patients with BMI less than 30kg/m^2
- **Exclusion Criteria-**
- ASA grade III and IV.
- patients with high risk of aspiration(full stomach, Gastroesophageal reflex disease, Pregnancy)
- Mouth Opening<4cm.
- Thyro-mental distance< 3 finger breadth or <6cm in adult
- Difficult Airway or Mallampatti grade III and IV patients.
- BMI more than 30kg/m^2
- Cervical spine disease
- Buccal mucosa carcinoma/Ca. Tongue
- **Sample Size :**
- A total of 60 patients were included in study and divided into two groups(30)
- Group **I** I-Gel :n=30
- Group **II** C-LMA :n =30
- After getting ethical committee clearance from office of the Dean, Gandhi medical College, Sultania road Bhopal Hospital and written informed consent from patients, the study was carried out on 60 patients of ASA grade I and ASA grade II.
- ***Anaesthesia Protocol***: A thorough pre-anaesthetic evaluation was done including taking brief history , general and systemic examination.
- The patients were connected to the multi para-monitor and the pre induction systolic BP, diastolic BP, MAP, heart rate, SPO2 was recorded.
- Inj. Glycopyrolate 0.2mg, inj. Ondensetron 4 mg IV, inj Pentoperezole 40mg iv. Inj. Midazolam 0.05mg/kg.iv , inj. fentanyl 2.5 mcg/kg iv, was given as premedication.
- Preoxygenation with 100 % O2 for 3 min and patients were induced with Inj. Propofol 2-3mg/kg. intravenously.
- Once an adequate depth of anaesthesia was achieved, appropriate size of (as per weight) Classical LMA or I Gel was inserted and connected to the anaesthetia work station after confirming correct placement. Anesthesia was maintained with a mixture

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of Oxygen and Nitrous oxide (40:60%) ,Inhalational agent Sevoflurane and iv paracetamol 1000mg.

- The ease of insertion was assessed by The grading of ease of insertion was recorded as

; easy (when assistant help was not required),
difficult(when jaw thrust was needed by assistant)and
very difficult (when jaw thrust and deep rotation or multiple attempt was used for proper device)

- number of attempts and duration of insertion was also assessed.
- Parameter like HR, SBP, DBP, MAP (hemodynamic variables), SpO2 was recorded before supraglottic device insertion,

immediately after insertion then after 1, 3, 5,10 ,15 and 30 min intra-operatively.

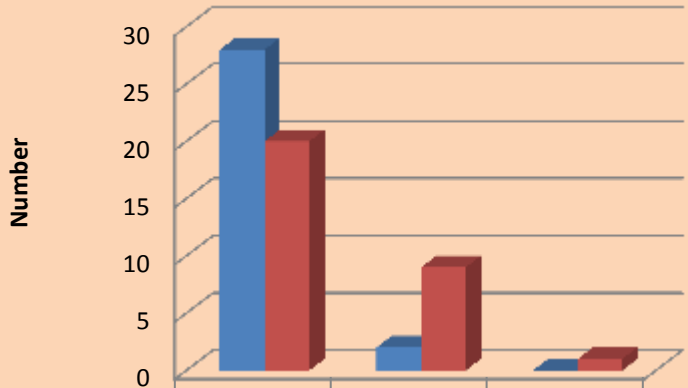
- At the end of surgery, the supraglottic device was removed when protective upper airway reflexes were ret **Postoperative adverse event assessement-**
- All cases were questioned to Airway trauma like Trauma to lip, oral mucosal or pharynx, Blood staining of supraglottic device on removal, Sore throat, Vomiting, Laryngospasm, Bronchospasm, Regurgitation of gastric contents, Hoarseness of voice.
- Verify any of the complications in postoperative room & 6 hrs post operatively.
- Follow up period:All patients were followed up for 6 hrs in post-operative care rooms.
- Statistical details : All the data were performed using SPSS ver. 20 software .Frequency distribution and cross tabulation was used to prepare the table. All observations were analysed using student t-test and chi square test and p-value <0.05 will be considered statistically significant.

3. OBSERVATION & RESULTS:

- Demographic parameters such as age, height, weight, gender, mallampatti grade, and ASA grading were comparable in both the groups.
- comparison of Ease of Insertion & Number of Attempts between group I & II. Insertion was found easy among 28(93.3%) patients in group I & 20(66.7%) patients in group II and was difficult among 2(6.7%) patients in group I and 9(30.0%) patients in group II. Insertion was very difficult among 1(3.3%) patients in group II pt. There was statistically significant difference in Ease of Insertion among group I & II. (P=0.034)
- Insertion was done in single attempt in 28(93.3%) patients of group I & 20(66.7%) patients of group II. Two attempt were required in 1(3.3%) patient of group I and 8(26.7%) patients of group II.
- Three attempts were required among 1(3.3%) patient in group I and 2(6.7%) patients in group II.There was statistically significant difference found in number of attempt of Insertion among group 1 & II (P=0.029)

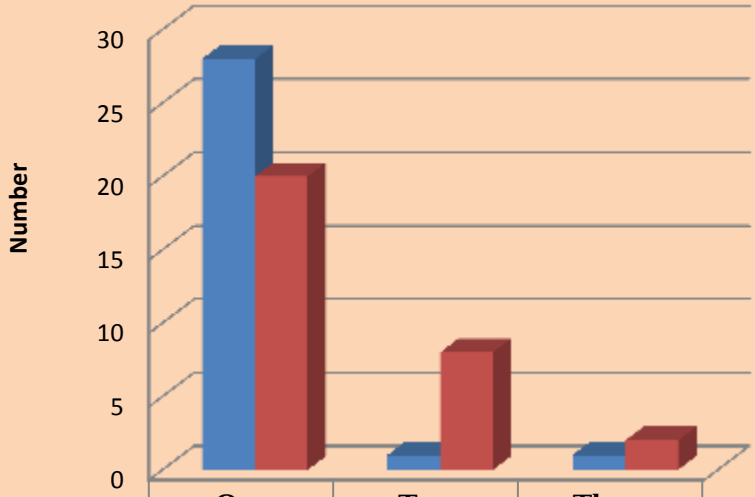
ISSN: 0975-3583,0976-2833 VOL12, ISSUE7, 2021

Graph (1): Comparative evaluation of Easy of Insertion between group I & II.



	Easy	Difficult	Very Difficult
Group I (I-GEL)	28	2	0
Group II (Classical LMA)	20	9	1

Graph (2): Comparative evaluation of Number of Attempts between group I & II.



	One	Two	Three
Group I (I-GEL)	28	1	1
Group II (Classical LMA)	20	8	2

Comparison of Time of Insertion between group I & II. Mean time of insertion was significantly higher in group II patients as compared to group I patients. It was 17.73±5.29 Seconds & 26.33±5.45seconds among group I & II respectively. Statistically significant

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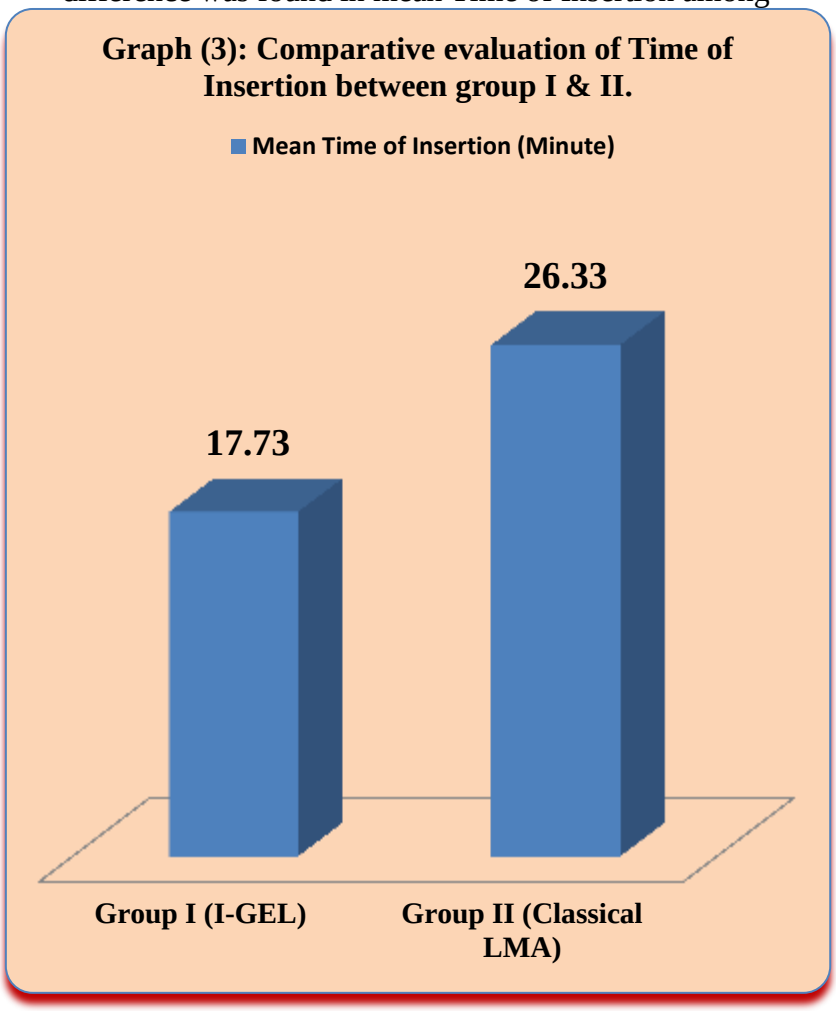
difference was found in mean Time of Insertion among

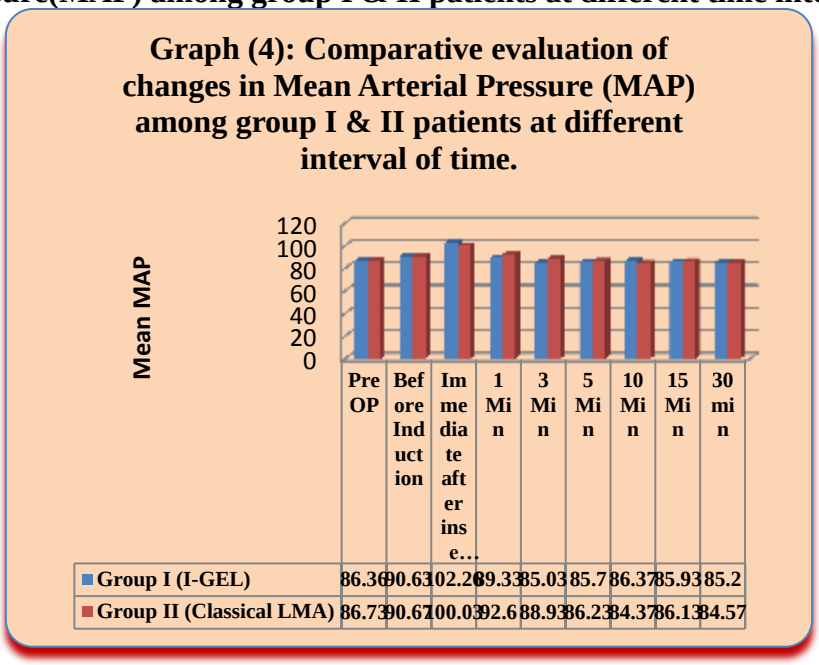


Group I & II.
(P=0.001)

Hemodynamic changes: comparison of changes in Mean Arterial Pressure(MAP) among group I & II patients at different time interval. Pre operatively Mean Arterial Pressure(MAP) was 86.36±5.7mmHg & 86.73±6.3 mmHg among group I & II patients respectively. It increased gradually and was at peak immediately after insertion then gradually decreases and after 30 minutes it was 85.20±14.7 & 84.57±4.9 mmHg among group I & II patients respectively. There was statistically no significant difference found **in Mean Arterial**

ISSN: 0975-3583,0976-2833 VOL12, ISSUE7, 2021

Pressure(MAP) among group I & II patients at different time interval



- Postoperative adverse effect: postoperative complications among group I & II patients.Out of 60 patients, there was no complication among 27(90.0%) patients in group I & 18(60.0%) patients in group II . Blood stain on device was seen among 2(6.7%) patients in group I & 7(23.3%)patients in group II. Sore Throat was found among 1(3.3%) patient in group I & 5(16.7%) patients in group II . There was significant difference statistically found in incidence of Postoperative Complication among group I & II patients. (P=0.027)

4. DISCUSSION

- Dr .Archie Brain in U.K introduced the first classical LMA in 1989 at London hospital, Whitechapel , which changed the scenario from "cannot intubate, cannot ventilate" to "cannot intubate, and can ventilate.
- The LMA is designed to establish proper and effective seal around the laryngeal inlet with an inflatable cuff. It is a useful advancement in airway management.
- The I-Gel (Intersurgical Ltd, Wokingham, UK)is the most popular novel device which is made up of thermoplastic elasometer which is gel like , transparent and soft which was introduced in 2007 by Dr Muhammed Aslam Nasir for clinical practice but it do not have an inflatable cuff like conventional LMA.
- LMA & i-gel can be used as a good alternative for giving general anaesthesia in short surgical procedures. The present study was done to compare the ease of insertion, hemodynamic changes and post operative adverse events between classical LMA and I Gel in short surgical procedures.
- The present study shows that In group 1 (I-Gel), the ease of insertion of I-Gel was easy to insert than classical LMA .
- Our study suggests I-Gel insertion was more successful in first attempt as compared to first time insertion with C-LMA.
- the present study was similar to A. Rajendran et al., Aadesh Kumar et al.

ISSN: 0975-3583,0976-2833 VOL12, ISSUE7, 2021

- In the present study, the time for insertion of I-Gel (17.73s±5.29.) was shorter as compared to C-LMA (26.33s±5.45s) which was highly significant statistically (p=0.001).
- Similar results were found in studies conducted by Smita R Engineer,et al, DI Kwak MD et al ' Gandhi M et al ,Rajendran et al' Aadesh et al' Dr Apeksha G.Kachhara et al·
- Hemodynamic changes:
- In the present study, there was no statistically significant difference found between I-Gel and C-LMA in terms of heart rate, systolic BP(SBP), diastolic BP(DBP) and mean blood pressure(MAP), and arterial saturation (SpO2),Et- CO2(end tidal CO2).
- Postoperative adverse events
- In the present study, there was statistically significant difference between I-Gel and C-LMA in regard to Postoperative adverse events like sore throat and blood staining of devices is less with I-Gel as compared with C-LMA.
- Similar results were found in studies conducted by Smita R Engineer,et al, Siddiqui AS et al,Gandhi M et al & Aadesh Kumar et al.

5. CONCLUSION

- Classical -LMA and I-Gel are safe and effective during short surgical procedures during general anaesthesia with positive pressure ventilation and spontaneous ventilation in selected patients.
- I-Gel is soft, gel like, transparent and designed to anatomically fit the pharyngeal, laryngeal and perilaryngeal structures without an inflatable cuff because of its non-inflatable seal. I-Gel contains drainage tube to prevent regurgitation and aspiration of gastric contents

In our study we concluded that I-Gel devices are easy to insert ,in less no. of attempts ,requiring less time of insertion and less post operative adverse events as compare to C-LMA . Classical -LMA and I-Gel have similar hemodynamic changes.

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ISSN: 0975-3583,0976-2833 VOL12, ISSUE7, 2021

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