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The I-Gel Versus Proseal Laryngeal Mask Airway

KEYWORDS

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AIMS AND OBJECTIVES OF STUDY

AIM

The main aim of this study was to compare the efficacy of I-Gel with theProseal LMA in 60 patients of ASA grade I/II posted for elective surgeries lasting <2 hours in dhiraj general hospital in supine position .

OBJECTIVES

The objective of this study was to compare I-gel with proseal LMA under the following parameters –

No. of attempts for insertion of device
Ease of insertion
Time taken for insertion.
Changes in hemodynamic parameters
Postoperative Side effects and complications (if any)

HISTORY AND REVIEW OF LITERATURE

The credit for developing the first extraglottic airway device with peri-laryngeal sealing mechanism is given to Dr Archibald Brain in 1983 and the device was named the Laryngeal Mask Airway (LMA).

LMA was the first device encircling directly laryngeal structures and the end of its bowl was located very close to vocal cords. The success of this device encouraged other inventors that subsequently in 1990s led to invention of other extraglottic airway devices.

Parul Jindal et all (2009)undertook a comparative study to evaluate and compare the hemodynamic changes during insertion of supraglottic devices LMA, SLIPA or IGEL . the results showed that no of intubation attempts were similar among all groups but in LMA group the intubation time was significantly longer (7.68±6.9) sec as compared to IGEL (3.48±1.41) sec and SLIPA (5.68±0.68) sec. he concluded that I-gel Conforms the perilaryngeal anatomy despite the lack of an inflatable cuff, consistently achieves proper positioning for supraglottic ventilation and thus less hemodynamic changes are caused as compared to other devices[21]

Anjan Das et all (April 2008 to July 2009, 2014) studied " I-GEL in ambulatory surgery : A Comparison with LMA-Proseal in Paralyzed Anaesthetized Patients .the results showed no difference in demographical data. Insertion of IGEL was easy as compared to PLMA (IGEL- 90%, PLMA 83.33%), insertion time of IGEL was shorter than PLMA (IGEL 14.9 sec PLMA 20 sec) and was statistically significant. In IGEL hemodynamic parameters were less altered as compared to PLMA and these results were statistically significant. thusit concluded that IGEL is a relatively newer and cheap supraglottic device, easier and quicker to insert, less stressful hemodynamicaly as compared to LMA-Proseal in day care surgery[22].

V Trivedi et all (2009) in his clinical comparative study of evaluation of Proseal LMA v/s I-GEL for ease of insertion and Hemodynamical Stability; mean duration of insertion for i-gel was 9.63±2.23sec while Proseal LMA was 11.73±3.084 sec. in i-gel 28/30 patient required single attempt and 27/30 patients required single attempt for ProsealLma, reflecting no significant difference .mean arterial pressure was significant intra operatively at 5 min, 10 min, 15 min and changes were higher in group Proseal LMA than I-gel. there was no significant difference with respect to mean pulse rate. Igel is a better alternative than PLMA in controlled ventillation and to secure airway in difficult airway management as compared to proseallma as it is easier to insert and produces less hemodynamic changes. [23]

MATERIAL & METHODS

This study was conducted at Dhiraj General Hospital in Department of Anaesthesiology in 2013-2015. 60 patients of ASA-I and II of American Society of Anesthesiologists' ,posted for general and orthopaedic elective surgeries lasting less than 2 hours were included in the study. All the patients participating in the study were explained clearly about the purpose and nature of the study in the language they could understand. They were included in the study only after obtaining a written informed consent . The study was retrospective and interventional in nature.

INCLUSION CRITERIA:

ASA physical status I and II.

Age between 18 to 50 years of both sexes and weight 30 to 70 kg.

posted for elective surgery < 2 hours

posted for surgery requiring supine position only

mouth opening -malampatti grade I/II

Pre-operative examination The patient was visited and pre-operative assessment was done.

Patients were randomly divided into 2 groups of 30 each:

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Group L(30 patients) for proseal LMA insertion.

Group I (30 patients) for I-gel insertion.

PROCEDURE: Informed written consent was taken from the patient. On the day of surgery, the patient was brought to the pre anaesthetic room and base line vital parameters (pulse, blood pressure, respiratory rate, SpO_2 and temperature) were recorded.

Patient was shifted to OT. An IV line was secured with 18 gauge vasofix, a slow infusion of lactated Ringer's solution was started. All resuscitation equipments were kept ready.

Standard monitors were connected and the pre-induction systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), oxygen saturation (SpO_2) were recorded.

Premedication
The patients were premedicated with

Inj. ondansetron 4mg
Inj Glycopyrolate 0.2 mg
Inj. midazolam 0.1-0.2 mg/kg
Inj.fentanyl 1microgram/kg, just before induction .

Induction
Patient will be preoxygenated for 3-5 minutes, induced with propofol 2-3 mg/kg. followed by scoline 1-2mg/kg and IPPV wih 100% oxygen on bag and mask. After adequate relaxation either I-GEL or PROSEAL LMA was inserted according to the groups.

Device insertion:
In group L :the LMA-PROSEAL was inserted according to the manufacturer's instruction manual according to weight based algorithm :

weight 30-50 kg: -size 3
weight 50–70 kg: size 4.

The LMA cuff will be inflated with 20 ml; 30 ml for size 3; 4 respectively as recommended by the manufacturer. [16]

In group I :the I-gel size 3, 4 was inserted according to the manufacturer's instructions. dependent on patient weight

weight 50 kg: i-gel size 3
weight50–90 kg: size 4.

ProsealLMA and I-gel were thus inserted as per the manufacturers recommended instructions and connected to the anaesthetic machine after confirming correct placement by observing chest movement and auscultation of breath sound and checking for any audible leak if present.

If it is not possible to insert the device or ventilate through it at first time, two attempts of insertion were allowed. If placements fail after two attempts, the case was excluded form the study and the airway was maintained through other airway device as suitable and this case was considered as a failed attempt.[17]

Maintenance of anesthesia
Patient was maintained on controlled mechanical ventilation with 50% oxygen, 50% nitrous oxide (N_2O) Inhalational agent(sevoflurane 2-3%)and dose of non depolarizing muscle relaxant (atracuruium loading dose -0.5mg/kg and maintainence dose 0.1mg/kg) was given as clinically needed during anaesthesia.

Reversal and removal of the device
Adequate oral suctioning was done. Pt was reversed by giving reversal in form of inj.glycopyrollate (0.008mg/kg) and inj. neostigmine (0.05 mg/kg) then the device was gently removed after the patient regains consciousness and responded to verbal command add about recovery score .

During the study the patients were monitored for following parameteres :
No of attempts of insertion (Proseal LMA or I-GEL)1/2/ failure to insertmore than 60 seconds was not allowed for single attempt

Time taken for insertion : was calculated by taking into account the time interval between picking up the device and securing an effective airway after connecting to the anesthetic machine and check ventilation

Ease of insertion of device : it was calculated by ease of insertion score

3 Insertion at first attempt without any tactile resistance
2 Insertion at first attempt with tactile resistance
1 Insertion successful at second attempt
0 Insertion failed at second attempt
Hemodynamic parameters:All patients were monitored continuously for following

parameters:
Heart rate (HR)

Systolic, diastolic blood pressure (SBP,DBP)
Percentage oxygen saturation.(SPO2)these were recorded prior to insertion of the device (baseline)after induction after insertion at 1, 5, 10, and 15 minutes Thereafter, monitoring was done at 15-minute intervals till the end of surgery

Postoperative Incidence of airway complications caused by insertion of devices like

Observing presence of blood on the I-gel or proseal LMA,
Lip or dental injury, Post removal cough, Dysphagia , dysphonia , Arrhythmia

Sore throat ,nausea / vomiting,were recorded and reassessed within 24 hours

Result
The patients studied across the group didn't vary much with respect to age, sex, weight, height and ASA classification (p value >0.05) non-significant.

In group L 20/30 (66.6%) patients required single attempt and 10/30 (33.3%) patients required second attempt as compared to group I in which 27/30 (90%) patients required single attempt for insertion of device and 3/30 (10%) patients required second attempt. the p value was highly significant (p= 0.03).

The ease of insertion score in GROUP L -36.6 %(11/30) patients - score 3, 30% (9/30) patients - score 2 and remaining 33.3% (10/30) patients - score 1. As compared to

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GROUP I -73.3% (22/30) patients - score 3, 16.6% (5/30) patients - score 2 and 10% (3/30) patients -score 1.the p value =0.002 which was statistically highly significant

The time of insertion of device in group L was 17.13 seconds as compared to 13.03 seconds in group I.thep value (< 0.0001) statistically highly significant.

The base line hemodynamic parameters were comparable amongst the two groups (p >0.05).the patients in both groups remained hemodynamically stable throughout the surgery.

There was an increase in heart rate from baseline in both groups after induction. However the increase in heart rate in group L was maximum at 5 mins post insertion and in group I it was maximum at 1 min post insertion. The p value (p >0.05) was statistically insignificant throughout.

The systolic blood pressure increased in both groups after induction. The increase in group L was more as compared to group I.there was significant statistical difference in both groups at 5 min 10 min and 15mins post insertion. (p value 0.03 ,0.007 , 0.04 at 5 min 10 min and 15 min respectively)

The diastolic blood pressure increased in both groups after induction.The increase in group L was more as compared to group I.there was statistical significant difference at 5 min, 10 min and 15 min post insertion with p value 0.001, 0.0001,0.0002 respectively

Post-operative complications observed in group L were more as compared to group I.In group L 4/30 (13.3%) patients had complain of sore throat, 5/30 (16.6%)had blood staining of device , 7/30 (23.3%) had dysphagia, lip and tongue injury while in group I 2/30 (6.6%) patients had complain of sore throat and none of the patients had complain of blood staining of device , dysphagia , lip or dental injury .

CONCLUSION

From the present study we conclude that among both supraglottic airway devices I-gel is a preferred alternative over ProSeal LMA as I-Gel offers certain advantages over Proseal LMA such as it requires less no of attempts , easier to insert and requires less time, with lower incidence of pharyngolaryngeal injury. It attenuates the hemodynamic stress response to insertion and produces less hemodynamic changes as compared to ProSeal LMA .Hence I-Gel can be preferably a better alternative over ProSeal LMA for elective surgeries in securing a patent airway , controlled ventillation and produces less side effects and postoperative complications .

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