ORIGINAL RESEARCH PAPER

Volume-7 | Issue-1 | January-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARISON OF HAEMODYNAMIC EFFECTS OF I.V. ETOMIDATE WITH I.V. PROPOFOL TO LMA (LARYNGEAL MASK AIRWAY) INSERTION

Anaesthesiology

Dr Pulankit Tandel* Resident Doctors, Department of Anaesthesiology, B. J Medical College, Ahmedabad-380016. Gujarat, India *Corresponding Author

Dr Bhavesh Zinzala Resident Doctors, Department of Anaesthesiology, B. J Medical College, Ahmedabad-380016. Gujarat, India

Dr Shweta Narsingani Resident Doctors, Department of Anaesthesiology, B. J Medical College, Ahmedabad-380016. Gujarat, India

ABSTRACT

Randomised blind study was conducted on 60 patients of 18 to 60 years age group of either sex of ASA physical status I or II planned for elective surgery. They were randomly divided in to two groups of 30 patients each, according to the drug received by them. **Group P**: received Propofol 2.5 mg/kg . **Group E**: received Etomidate 0.3mg/kg. After adequate pre oxygenation and pre medication, Induction of anaesthesia was carried out according to the groups using Inj. Propofol 2.5 mg/kg or Inj.Etomidate 0.3mg/kg, Inj. Scoline 2 mg/kg was given as muscle relaxant and LMA was inserted. Vital parameters like heart rate, noninvasive blood pressure, respiratory rate and SpO2 were monitored throughout the surgical procedure. Patients were observed for ease of insertion, attempts and duration of LMA insertion and response to LMA insertion. Patients were also observed for haemodynamic parameters like heart rate, SBP, DBP, MBP, RR, SPO2 at baseline,time of premedication, just before insertion, just after insertion and 1,2,3,4,5,10,15,30,45,60 minutes after LMA insertion.

KEYWORDS

LMA, etomidate, Propofol, haemodynamic effects

INTRODUCTION:

For general anaesthesia, anaesthesiologist has to secure an airway and to provide adequate ventilation to the patient. Management of the airway has come a long way since the development of endotracheal intubation by Macewen in 1880 to the present day usage of sophisticated supra laryngeal devices.. Laryngoscopy and endotracheal intubation require skill and it is associated with reflex sympathetic stimulation, hypertension, tachycardia, myocardial ischemia, depression of myocardial contractility, ventricular arrhythmias and intracranial hypertension. This response can be avoided if supralaryngeal airway devices are used. The LMA is shaped like a large endotracheal tube on the proximal end that connects to an elliptical mask on the distal end. It is designed to sit in the patient's hypopharynx and cover the supraglottic structures, thereby allowing relative isolation of the trachea.

Etomidate is a popular rapid acting inducing agent. Etomidate is a carboxylated imidazole containing compound. It appears to depress CNS function via GABA. Duration of action is intermediate between thiopental and methohexital, and recovery from a single dose is rapid with little residual depression.

Etomidate is characterized by hemodynamic stability, minimal respiratory depression and cerebral protective effects. Its lack of effect on sympathetic nervous system, baroreceptor function and its effect of increased coronary perfusion even in patients with moderate cardiac dysfunction makes it an inducing agent of choice. Undesirable side effects of etomidate that may limit its use include pain on injection, myoclonus and adreno-cortical suppression lasting 4-6 hours following an induction dose.

Propofol is a short-acting, intravenouslyhypnotic/ amnestic. Its uses include the induction and maintenance ofgeneral anesthesia, sedation for mechanically ventilated, and. Inill patients, propofol has been found to be superior tolorazepamin effectiveness and overall cost. Propofol is also used for procedural sedation, for example duringendoscopic. Its use in these settings results in a faster recovery compared tomidazolam. One of propofol's most frequenteffectsis pain on injection, especially in smaller veins, It can be mitigated by pre-treatment withlidocaine. Additional side effects include lowblood pressuretovasodilation, transientapnoeainduction doses, and cerebrovascular effects. Propofol has more pronounced hemodynamic effects relative to many intravenous anesthetic agents.ofpressuredrops of 30% or more are thought to be at least partially due to inhibition of sympathetic nerve activity.can also cause decreasedsystemic vascular resistance, myocardial blood flow, and oxygen consumption, possibly through direct vasodilation.

This study is designed to compare the haemodynamic effects of IV Etomidate with IV Propofol to LMA insertion.

MATERIALS AND METHOD-

After obtaining institutional ethical committee approval and written informed valid consent, a study of 60 patients of either sex, ASA-I/II in the age group of 18-60 years was conducted in Civil hospital, Ahmedabad.

STUDY DESIGN:

A **Randomized, Prospective and Double-Blind Comparative** study was done. 60 patients were divided into two equal groups.

Group P: received Propofol 2.5 mg/kg
Group E: received Etomidate 0.3mg/kg

Pre-operative evaluation was carried out a day before the surgery.
A thorough history was taken, and a detailed examination carried out.

Patients subjected to routine and relevant investigations like Random blood sugar, CBC, renal and liver function tests, Chest X-Ray, 12 lead ECG.

The procedure was explained to the patient and written informed consent taken.

Patient was taken inside the operation theatre. Intravenous line was secured, and patients were pre-medicated with Inj. Glycopyrrolate 0.004mg/kg IV and Inj.Ondansetron 0.15 mg/kg IV and Inj. Fentanyl 2 mcg/kg. ECG, SpO2, NIBP were applied. baseline Pulse rate, Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), Mean Arterial blood Pressure (MBP) and SpO2 were recorded.

The patients were pre-oxygenated for 3 mins using 100% oxygen with Bain's circuit. Induction of anaesthesia was carried out according to the groups using Inj. Propofol 2.5 mg/kg or Inj.Etomidate 0.3mg/kg, Inj. Scoline 2 mg/kg was given as muscle relaxant and LMA was inserted. Proper placement of device checked by 1) With IPPV-Chest Expansion 2)No audible sound on IPPV(Major Leak 3)No gastric insufflations 4)Presence of EtCO2 square wave forms 5)SpO2

Ease of insertion, Number of insertion attempts, Each attempt duration

(time from picking up the device until attaching it to the breathing system in minutes), Failed attempts (removal of device from mouth before reinsertion with or without change of device, Manipulation required (gentle pushing/pulling/chin lift/jaw thrust/head extension/ neck flexion, Changeover to other devices noted (ET Tube)

Response to LMA insertion -Hiccup, Laryngospasm, Any excitatory phenomenon head/limb movements/muscle twitching

Anaesthesia was maintained by using 50% oxygen, 50% nitrous oxide, Isoflurane / Sevoflurane and/or intravenous Inj. Vecuronium Bromide 0.08mg/kg or intravenous inj.Atracurium 0.5mg/kg.

Patients were observed for following haemodynamic changes at the time of premedication, just before induction and just after LMA insertion,1,2,3,4,5,10,15,30,45,60 minutes after LMA insertion.

1) Pulse 2) Blood pressure (SBP, DBP, MBP) 3) EtCO2 4) SpO2 On completion of surgery, Neuro muscular blockade was reversed using intravenous Inj.Glycopyrrolate 0.008 mg/kg and Inj. Neostigmine 0.05mg/kg .Postoperatively complication like Cough / breath holding / laryngeal spasm /presence of blood on devices / lip or dental injuries noted.

RESULTS-

TABLE 1 DEMOGRAPHIC DATA

Variables	GROUP E (n=30)	GROUP P (n=30)	P VALUE
Age in years (Mean ± SD)	27.77 ± 10.08	31.83+10.69	0.1356
Weight in kg (Mean ± SD)	53.16 ± 4.99	54.66 ± 5.24	0.2609
Sex ratio (M: F)	14: 16	14 : 16	

- As per Table–1, Both groups were comparable in respect to Age, Sex and Weight. There was no statistically significant (p>0.05) difference between both gropus.

TABLE 2 HEART RATE IN BOTH GROUPS AT DIFFERENT TIME INTERVAL

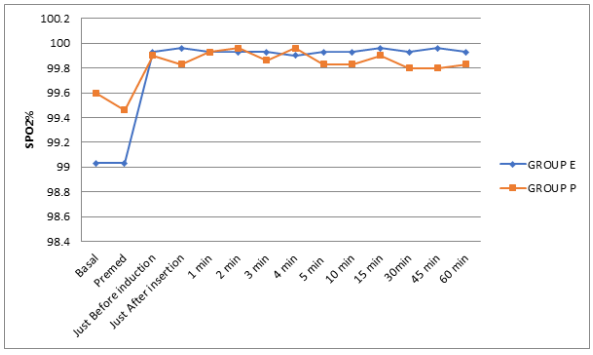
	Group E (Mean±SD)	Group P (Mean±SD)	P value
Basal	84.36±7.91	82.3±8.43	0.3331
Premed	85.43±8	82.9±9.04	0.2557
Just Before induction	84.73±8.68	82±7.94	0.2088
Just After insertion	85.86±8.56	82.06±7.4	0.0710
1 min	85.66±8.09	82±7.87	0.0810
2 min	85.96±8.74	82.2±8.33	0.0934
3 min	85.7±8.42	81.46±8.67	0.0596
4 min	85.2±8.02	81±8.96	0.0607
5 min	85.23±7.41	81.5±9.23	0.0897
10 min	85.03±8.31	81.63±8.87	0.1309
15 min	84.7±8.2	81.43±8.47	0.1341
30 min	84.53±8.63	81.97±8.9	0.2627
45 min	84.43±8.69	80.53±8.25	0.0799
60 min	85.23±8.21	81.03±8.83	0.0614

TABLE 3
COMPARISON OF MEAN ARTERIAL BLOOD PRESSURE-

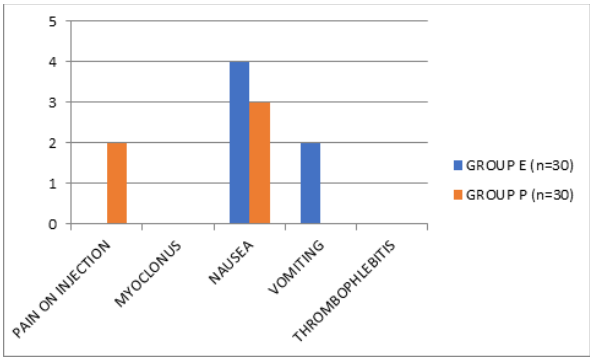
- Table 3 shows mean blood pressure in two different groups at different time interval. There was **a statistically significant (p<0.0001) fall in mean blood pressure in Propofol group** just after insertion of LMA upto 15 minutes (p=0.0015) following insertion was noted compared to Etomidate group.

	Group E (Mean±SD)	Group P (Mean±SD)	P value
Basal	96.36±3.23	96.92±2.83	0.4779
Premed	96.06±3.07	95.42±2.62	0.3887
Just Before induction	95.64±2.76	95.71±2.82	0.9229
Just After insertion	95.47±3.11	92.21±2.57	<0.0001
1 min	95.57±2.83	91.41±2.93	<0.0001
2 min	95.27±2.68	91.48±3.35	<0.0001
3 min	95.12±2.66	91.88±3.35	<0.0001
4 min	96.08±2.6	92.3±2.98	<0.0001
5 min	96.58±2.37	92.97±3.22	<0.0001
10 min	97.12±2.43	93.96±3.23	<0.0001
15 min	97.55±2.84	95.11±2.84	0.0015
30 min	97.15±3.46	95.85±2.72	0.1111
45 min	97.66±3.83	95.74±2.63	0.0274
60 min	97.5±3.81	96.41±2.77	0.2101

GRAPH 1 SPO2 CHANGES IN BOTH GROUPS AT DIFFERENT TIME INTERVAL



GRAPH 2 COMPLICATIONS IN BOTH GROUPS



DISCUSSION:

The Laryngeal mask was designed primarily as a means of offering some of the advantages of endotracheal intubation while avoiding this fundamental disadvantage, since the vocal cords need be neither visualized nor forced apart. The placement of LMA which resulted in less hemodynamic response compared to placement of an endotracheal tube. Smooth and successful insertion of LMA requires adequate mouth opening with suppressed upper airway reflexes to avoid gagging, coughing and laryngospasm. Etomidate has been shown to provide stable haemodynamic while blunting the response to laryngoscopy for the induction of anaesthesia The usual induction dose of Propofol needed for adequate jaw relaxation and to prevent other complication to LMA insertion was higher and result in hypotension. Etomidate, as a sole induction agent, does not provide adequate jaw relaxation for the insertion of LMA. The numerous methods like prophylactic dexmedetomidine, fentanyl,

succinylcholine, isoflurane used to prevent hypotension and to provide adequate insertion.

We had taken Propofol in the dose of 2.5 mg/kg and Etomiate 0.3mg/kg. In 2012 Hashaam Ghafoor et al10 used etomidate in dose of 0.3 mg/kg and propofol in dose of 3mg/kg In our study we found no statistically significant difference (p>0.05) for gender in both groups (M: F = 14:16). In our study type of surgeries were comparable in both groups, which include breast fibroadenoma excision, chest abscess incision and drainage, axillary lipoma excision.

In our study we found Mean duration of insertion of LMA in Group E was 36.33±2.77 seconds compared to 34.33 ± 2.65 seconds in Group P which was statistically (p=0.0059) significant. The successful insertion of LMA at first attempt was found in 93.3% patients in Group P compared to 80% in Group E. Propofol alone does not provide adequate jaw relaxation for the insertion of LMA. In our study 30%

patients in Group E required manipulation during LMA insertion compared to 10% patients in group P. We found better result than previous study because we have used succinylcholine as muscle relaxant. 1 patient in group E developed hiccup following LMA insertion and 1 patient in group P developed excitatory head movement HEART RATE: we found initial increase in heart rate in both groups then no change in heart rate in etomidate group and fall in heart rate in Propofol group which was not statistically significant ($p>0.05$) at any point of time.

BLOOD PRESSURE: we found fall in systolic and diastolic blood pressure in both groups just after insertion of LMA which was higher in Group P. We found fall in SBP in Group P from just after insertion ($p=0.0012$) LMA upto 15 minutes after insertion ($p=0.0008$) which was statistically significant than group E. Fall in mean blood pressure was noted just after insertion of LMA upto 10 minutes after insertion which was statistically significant ($p<0.0001$) in Group P compared to Group E.

COMPLICATIONS

Laryngospasm was not encountered by us in either study group because we ensured adequate depth of anaesthesia before LMA insertion. Pain on injection seen in two patients in Group P. Pain on injection of propofol occurs in 28-90% of patients. Although the mechanism responsible for the propofol induced venous pain is unknown, it has been suggested that it resulted from activation of the kinin cascade system. Nausea seen in 4 and 3 patients in Group E and Group P respectively.

Myoclonus is one of the most common side effect of Etomidate induction. In a study by Uzun et al 19 2007 found 56% of patients received Etomidate had myoclonus, in our study we had not found myoclonus in a single patient because we used fentanyl as premedication and succinylcholine as muscle relaxant.

CONCLUSION:

To conclude the study, we observed that Etomidate a haemodynamically stable drug having better profile in terms of preventing fall in systolic, diastolic and mean blood pressure compared to propofol following Laryngeal mask airway insertion, however it may not provide the ideal insertion condition even if it is supplemented with fentanyl and succinylcholine.