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Research Paper

Comparative Study of Intravenous Bolus Dose of Esmolol and Lignocaine for Attenuation of Hemodynamic Response to Laryngoscopy And Endotracheal Intubation

Medical Science

KEYWORDS : Atrial Fibrillation, Rheumatic Valvular Heart Disease, Mitral Stenosis, Mitral,Regurgitation, Aortic Regurgitation Aortic Stenosis

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ABSTRACT

Aim:

To compare Esmolol and Liganocaine for:

1. Attenuating the stress response to laryngoscopy and endotracheal intubation.

2. Possible side effects and probable complication during perioperative period.

Material & Method:

50 patients of ASA physical status I or II aged between 20-40 years of either sex were selected for this study who were scheduled for elective surgeries under general anesthesia and divided into two groups (each group containing 25 patients).

Group – I : Lignocaine hydrochloride group: Here patients received preservative free injection Lignocaine, 1.5 mg/kg IV bolus of 2% solution 3 min prior to intubation.

Group – II : Esmolol group: Here patients received preservative free injection Esmolol 1.5 mg/kg IV bolus of 1% solution 3 min prior to intubation

Results & summary:

Changes in mean pulse rate and MBP was significant after intubation and intraoperatively with mean pulse rate, MBP being higher in group-I than group- II. Esmolol provides better protection in patients with cardiovascular or cerebrovascular disease in routine noncardiac surgery against hyperadrenergic response to laryngoscopy and endotracheal intubation. In situation where opioid analgesics are contraindicated, Esmolol would appear to be the drug of choice in maintaining hemodynamic stability during laryngoscopy and intubation.

Conclusion:

After study we conclude that Esmolol was more potent in case of hemodynamic stability during intubation.

INTRODUCTION:

The study is done to find out a safe, comfortable, cheap and effective

Mean to attenuate stress and sympathetic response to laryngoscopy and Endotracheal intubation

Aims were as follows:

1. To study the effectiveness of intravenous bolus doses of injection Lignocaine hydrochloride and injection Esmolol in attenuating the stress response to laryngoscopy and endotracheal intubation.
2. To ascertain the effectiveness of Lignocaine hydrochloride and Esmolol in suppressing sympathetic response.

MATERIALS AND METHODS:

Following approval from institutional review board, this prospective double blind study was carried out on randomly selected 50 patients of ASA grade 1 and 2, aged between 20 to 40 yrs, scheduled for elective surgery requiring general anesthesia with endotracheal intubation.

(A) Anesthetic protocol:

(1) Preoperative preparation:

All patients were fasted overnight and sedated with Tab. Alprazolam 0.25mg orally at bed time. Vital signs noted in the preoperative room were considered as baseline values.

(2) Premedication:

On the day of surgery in preoperative room – SBP, DBP and pulse rate were recorded and Injection Glycopyrrolate 0.004 mg/kg intramuscularly were given 30 min prior to induction. On entering the operation theater, IV line secured with 18 G cannula and pulse oximeter, non-invasive BP, ECG monitor were applied. Heart rate, SBP, DBP and MAP were recorded and injection Midazolam 0.02 mg/kg was given intravenously and IV infusion of ringer lactate was started.

(3) Study groups:

Patients were randomaly divided into two groups and each group consisted of 25 patients.

Group – I : Lignocaine hydrochloride group: Here patients received preservative free injection Lignocaine, 1.5 mg/kg IV bolus of 2% solution 3 min prior to intubation.

Group – II : Esmolol group: Here patients received preservative free injection Esmolol 1.5 mg/kg IV bolus of 1% solution 3 min prior to intubation

(4) Anesthetic technique:

All patients were preoxygenated with 100 % oxygen by mask for 3 min before induction. Precalculated dose of Lignocaine and Esmolol were given intravenously slowly in group 1 and 2 respectively.

Induction was achieved with injection Thiopentone sodium 5 mg/kg (2.5 % solution) and injection Vecuronium bromide 0.1 mg/kg intravenously to facilitate intubation.

IPPV was given with 100% oxygen. Laryngoscopy and intubation was done after 3 mins of study drug using standard Macintosh blade. Oral intubation was done with appropriate sized disposable high volume low pressure portex cuffed endotracheal tube within 15 to 20 sec. (Not more than 30 sec).

All the patients were ventilated with Bain's circuit and anesthesia was maintained with O_2 (33%), N2O (67%), Isoflurane (0.5-1.0%) & injection Vecuronium bromide.

At the end of surgery anesthesia was reversed with injection

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Neostigmine 0.05 mg/kg and injection Glycopyrollate 0.004 mg/kg intravenously.

(5) Monitoring:
Intraoperative vitals were monitored using ECG, pulse oximeter, NIBP and capnography. HR, SBP, DBP and MAP were recorded in all patients – 30 min before induction, after pre medication, after study drug, at intubation and for every 1 min, 3 min, 5 min, 7 min after intubation during which no stimulus was given to the patients.

(6) Complications:
An observation was made related to adverse effects of the drugs and anesthesia related problems and were attended to appropriately.

(7) Statistical analysis:
Descriptive data of both groups were compared by unpaired "t" test. For all the tests "p" value of less than 0.05 was considered for statistical significance..

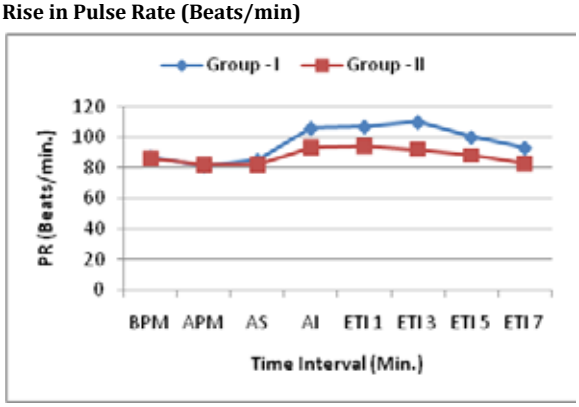
OBSERVATION AND RESULTS:
This study is for comparing efficacy of Lignocaine and Esmolol (ultra short acting B1 blocker) in attenuating the stress response to laryngoscopy and endotracheal intubation.

Both group were consisting of 25 patients, each selected at random.

Rise in Pulse Rate (Beats/min)

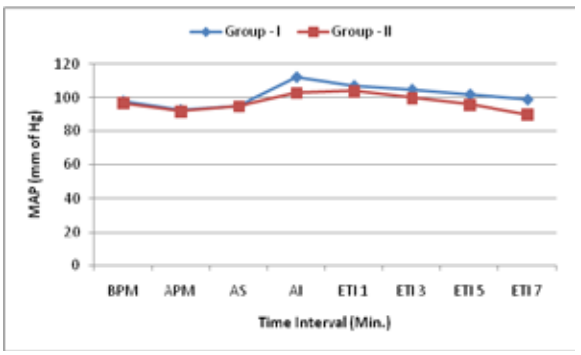
Recording Interval	Group – I		Group – II	
	Beats/Min	%	Beats/min	%
BPM	87 ± 10	-	86 ± 14	-
APM	81 ± 10	2	82 ± 13	-
AS	85 ± 10	2	82 ± 12	2
AI	106 ± 17	32	93 ± 12	14
ETI 1	107 ± 16	33	94 ± 12	13
ETI 3	110 ± 16	11	92 ± 12	11
ETI 5	100 ± 17	24	88 ± 11	7
ETI 7	93 ± 13	15	83 ± 10	2

Rise in Pulse Rate (Beats/min)



Recording Interval	Group – I		Group – II	
	mm of Hg	%	mm of Hg	%
BPM	98 ± 6	-	97 ± 6	-
APM	93 ± 8	-	92 ± 7	-
AS	95 ± 5	2	95 ± 6	3
AI	112 ± 5	16	103 ± 7	12
ETI 1	107 ± 6	15	104 ± 8	13
ETI 3	105 ± 7	13	100 ± 7	9
ETI 5	102 ± 7	10	96 ± 8	4
ETI 7	99 ± 8	7	90 ± 7	-

Rise in Mean Arterial Pressure (mm of Hg)



CONCLUSION:
A comparative study of intravenous bolus doses of Lignocaine Hydrochloride and Esmolol for attenuating hemodynamic response to laryngoscopy and endotracheal intubation was carried out.

From this study, it was concluded that Esmolol was better as compared to Lignocaine in attenuation of pressure response to laryngoscopy and endotracheal intubation by suppressing sympathoadrenal reflex activity.

We conclude the following:

(1) The pulse rate and blood pressure rise was more in patients of Lignocaine group as compared to Esmolol.
(2) Lignocaine hydrochloride 1.5 mg/kg used 3 minute prior to induction, failed to attenuate the hemodynamic response.
(3) Esmolol 1.5 mg/kg, 3 minute prior to induction resulted in attenuation of hemodynamic response. It provides consistent and reliable protection against increase in both pulse rate and systolic arterial pressure.
(4) No adverse effect of Lignocaine or Esmolol were found with the studied dosage.
(5) Esmolol provides better protection in patients with cardiovascular or cerebrovascular disease in routine noncardiac surgery against hyperadrenergic response to laryngoscopy and endotracheal intubation. In situation where opioid analgesics are contraindicated, Esmolol would appear to be the drug of choice in maintaining hemodynamic stability during laryngoscopy and intubation.

Thus, Esmolol is safe and effective in attenuation of hemodynamic response to laryngoscopy and intubation without significant side effects.

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