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EFFECT OF LABETALOL AND LIGNOCAINE ON HEMODYNAMIC RESPONSE TO LARYNGOSCOPY AND ENDOTRACHEAL INTUBATION

Hanumanla Baby Rani, Chikkam Yamini

Direct laryngoscopy and endotracheal intubation is a noxious stimuli and induce sympathomimetic responses. Although well tolerated in healthy subjects, it may impose life-threatening arrhythmias, left ventricular failure or rupture of cerebral aneurysm in susceptible patients.

***The aim** is to study the effects of intravenous labetalol and lignocaine on haemodynamic responses to laryngoscopy and endotracheal intubation.*

***Materials and methods:** It is a cross-sectional and randomized controlled study with two study groups was planned. 70 patients were randomly assigned to one of two groups: those receiving Labetalol 0.25 mg/kg (n=35) or those receiving lignocaine 1mg/kg (n=35). The parameters assessed are heart rate, systolic BP, diastolic BP and Mean arterial pressure. Baseline parameters were recorded at the time of induction, post-intubation immediately and 1, 3, 5, 10 minutes later.*

***Results:** In the current study, at the time of induction, the mean heart rate was 65.97±5.22 per min in group LB whereas the mean heart rate was 76.66±8.49 per min in group LG which was statistically significant (P value <0.001). There was significantly reduced systolic blood pressure at 1min after intubation, 3min after intubation, 5min after intubation, and 10min after intubation in patients of group LB when compared with patients of group LG (P value <0.05). Significantly reduced diastolic blood pressure at 1 min after intubation, 3 min after intubation, 5 min after intubation, and 10 min after intubation in patients of group LB when compared with patients of group LG (P value <0.05).*

***Conclusions:** It was concluded in the present study that intravenous labetalol of dosage 0.25 mg/kg before laryngoscopy and endotracheal intubation was efficient in attenuating the hemodynamic parameters*

***Keywords:** Labetalol, lignocaine, endotracheal intubation, heart rate, laryngoscopy, sympathomimetic reflexes, hemodynamic parameters, Mallampati airway assessment*

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1. Introduction

Patients who have myocardial ischemia, heart failure, elevated intracranial pressure, or cerebral haemorrhage may experience negative side effects despite the temporary increase in blood pressure and heart rate brought on by laryngoscopy and intubation. Laryngoscopy and intubation procedures are not only limited to the operation room but also for non-operative procedures like fiberoptic bronchoscopy, intubation for aspiration prevention and airway protection in trauma patients, and during mechanical ventilation. It is crucial to lessen the sympathetic reactions induced by any of these procedures during laryngoscopy and tracheal intubation. Sympathetic stimulation from the stress reaction typically causes an increase in blood pressure and heart rate. When the parasympathetic nervous system is activated, bradycardia, coughing, and bronchoconstriction may result [1, 2].

Proprioceptors in the trachea and supraglottic region react to tissue irritation to start the cardiovascular reactions to noxious airway manipulation. These proprioceptors, which are situated near the airway mucosa, are made up of polymodal terminals of unmyelinated nerve fibres, slowly adapting stretch receptors with large-diameter myelinated fibres and mechanoreceptors with small-diameter myelinated fibres. These impulses are transmitted to the brainstem by the vagal and glossopharyngeal afferent neurons, which then activate the sympathetic and parasympathetic nervous systems, resulting in extensive autonomic activation. Bradycardia is the autonomic counterpart of the laryngospasm reaction and is frequently induced during laryngoscopy or intubation in newborns and young children. This reflex, however uncommon in adults, is essentially a monosynaptic reaction to a noxious stimulus in the airway and is caused by an increase in vagal tone in the sinoatrial node [3].

The more frequent reaction to airway manipulation in adults and adolescents is hypertension and tachycardia, which are mediated by the sympathetic chain

ganglia and cardio accelerator neurons. Norepinephrine is widely released from adrenergic nerve terminals as part of this reaction, and the adrenal medulla also secretes epinephrine. The stimulation of the renin-angiotensin system, which includes the release of renin from the renal juxta glomerular apparatus, which is innervated by -adrenergic nerve terminals, contributes to some of the hypertensive response to endotracheal intubation. Laryngoscopy and endotracheal intubation stimulate the central nervous system in addition to the autonomic nervous system, as shown by increases in electroencephalographic (EEG) activity, cerebral metabolic rate, and cerebral blood flow (CBF) [4]. The rise in CBF may cause high intracranial pressure (ICP) in patients with impaired intracranial compliance, leading to significant neurologic impairment and herniation of brain matter. Various strategies have been employed to minimize the hemodynamic response to laryngoscopy and intubation and are aimed at different levels of reflex arc [5]. To study the effects of intravenous labetalol and intravenous lignocaine on haemodynamic responses to laryngoscopy and endotracheal intubation.

The aim is to study the effects of intravenous labetalol and intravenous lignocaine on haemodynamic responses to laryngoscopy and endotracheal intubation.

Objectives to determine the effects of intravenous labetalol and intravenous lignocaine on the hemodynamic response to laryngoscopy and intubation.

To compare the effects of intravenous labetalol and intravenous lignocaine on the hemodynamic response to laryngoscopy and intubation

2. Methods and materials

It is an institutional-based cross-sectional and randomized controlled study with two study groups was planned, and the study was approved by the institutional ethical committee at Gandhi General Hospital in Secunderabad (IEC/GMC/2020/12/01 dated: 01/12/2020). Informed written consent was obtained from the patients participating in the study. One and a half years, beginning in January 2021 to 2022. This study included 70 patients who provided written consent and met the inclusion and exclusion criteria.

Selected patients were randomly assigned to one of two groups: those receiving Labetalol 0.25 mg/kg (n=35) or those receiving lignocaine 1 mg/kg (n=35).

Inclusion Criteria: Age: 18–50 years of both sexes, ASA grade I and II, BMI <30 kg/m^2, patients undergoing tracheal intubation for elective surgeries with Mallampati airway assessment grade I& II.

Exclusion Criteria: Patients with renal or hepatic dysfunction, two or more intubation attempts**,** allergic to study drugs and pregnancy and lactation.

Patients were divided into two groups using a computer-based random number generator: the Labetalol group (group LB) and the Lignocaine group (LG group)

All patients were secured with 18 G IV lines in the operating room and started on intravenous fluids. Standard monitors were attached. The pulse rate, ETco2, blood pressure, and SpO_2 levels were continuously monitored.

Premedication was given to all patients. Glycopyrrolate 0.2 mg IV, Midazolam 0.02 mg/kg, Fentanyl 2 mcg/kg. Induction was accomplished with Inj. Propofol 2 mg/kg wt.

Then, 2 minutes before intubation, group LB patients received Labetalol 0.25 mg/kg wt, and group LG patients received Lignocaine 1 mg/kg weight intravenously.

Succinylcholine was then administered to aid intubation and ventilation. Following intubation, anaesthesia was maintained with 1 MAC sevoflurane, 60 % nitrous oxide, 40 % oxygen, and intermittent doses of vecuronium.

The parameters assessed are Heart rate, Systolic BP, Diastolic BP and Mean arterial pressure. Baseline parameters were recorded at the time of induction, post-intubation immediately and 1, 3, 5, 10 minutes later.

Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. Data was also represented using appropriate diagrams like bar diagrams, pie diagrams and box plots. Pearson's χ^2 test and ANOVA test were used. Statistical analysis was made with IBM SPSS 20.0 software, and a P value of <0.05 was considered significant.

3. Results

All demographic parameters are comparable in the study, i.e. there is no significance between the 2 groups (Table 1).

Table 1

Demographic profile in the present study

Age (years)	Group LB		Group LG	
	N	%	n	%
1	2	3	4	5
18–20	4	11.4	5	14.3
21–30	7	20.0	11	31.4
31–40	8	22.9	9	25.7
41–50	16	45.7	10	28.6
Total	35	100.0	35	100.0
Mean±SD	31.46±10.35 years		32.77±9.41 years	
Minimum	18 years		20 years	
Maximum	48 years		46 years	
P value	0.580			
Gender distribution				
Male	22	62.9	19	54.3

Continuation of the Table 1

1	2	3	4	5
Female	13	37.1	16	45.7
Total	35	100.0	35	100.0
P value	0.467			
ASA				
I	29	82.9	30	85.7
II	6	17.1	5	14.3
Total	35	100.0	35	100.0
P value	0.743			
Height (cm)	161.60	5.70	159.54	4.27
P value	0.092			
Weight (kg)	58.49	6.17	56.17	5.52
P value	0.103			
BMI (kg/m^2)	22.33	1.36	21.99	1.62
P value	0.907			

In the current study, 77.1 % of patients had a modified Mallampati score of class I and 22.9 % of patients had a modified Mallampati score of class II in group LB whereas 74.3 % of patients had a modified Mallampati score of class I, and 25.7 % of patients had modified Mallampati score of class II. There was no statistical significance (P=0.780).

The mean duration of laryngoscopy in patients of group LB was 14.89±1.83 sec, whereas the mean duration of laryngoscopy in patients of group LG was 15.57 3.49 sec. there was no statistical difference (P=0.307) (Table 2).

The mean heart rate, systolic blood pressure(SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP) and SPO_2 in patients of group LB and group LG were statistically not significant (Table 3). In the current study, at the time of induction, the mean heart rate was 65.97±5.22 per min in group LB whereas the mean heart rate was 76.66±8.49 per min in group LG which was statistically significant (P<0.001) (Table 4).

Table 2

Modified Mallampati Score in the present study

MMS	Group LB	Group LG		Group LG
	N	%	N	%
Class I	27	77.1	26	74.3
Class II	8	22.9	9	25.7
Total	35	100.0	35	100.0
P value (*difference between groups in some cases statistically*)	0.780			
Duration of laryngoscopy (sec)	14.89	1.83	15.57	3.49
P value (*difference between groups in mean statistically*)	0.307			

Table 3

Baseline hemodynamic parameters:

Baseline parameters	Group LB		Group LG		P value
	Mean	SD	Mean	SD	
Heart rate	85.63	8.58	88.11	10.21	0.274
SBP	119.51	8.28	121.11	10.96	0.493
DBP	79.03	6.55	81.17	6.64	0.178
MAP	92.31	6.09	94.34	7.31	0.211

Table 4

Comparison of baseline hemodynamic parameters at the time of induction

At the time of induction	Group LB		Group LG		P value
	Mean	SD	Mean	SD	
Heart rate	65.97	5.22	76.66	8.49	<0.0001
SBP	118.06	8.99	115.89	8.89	0.313
DBP	76.40	7.32	76.31	6.15	0.958
MAP	90.17	6.95	88.06	6.54	0.195

In the current study, heart rate was recorded before intubation, 1 min after intubation, 3 min after intubation, 5 min after intubation, and 10 min after intubation. The mean heart rate was significantly reduced in patients of group LB when compared with patients of group LG (P value <0.05) (Table 5).

Mean systolic blood pressure was comparable in patients among the study groups before intubation (P=0.346).

There was significantly reduced systolic blood pressure at 1min after intubation, 3min after intubation, 5min after intubation, and 10 min after intubation in patients of group LB when compared with patients of group LG (P<0.05) (Table 6).

Mean diastolic blood pressure was comparable in patients among the study groups before intubation (P=0.675). There was significantly reduced diastolic blood pressure at 1 min after intubation, 3 min after intubation, 5 min after intubation, and 10 min after intubation in patients of group LB when compared with patients of group LG (P<0.05) (Table 7).

Mean arterial blood pressure was comparable in patients among the study groups before intubation (P=0.345). There was significantly reduced mean arterial pressure at 1 min after intubation, 3 min after intubation, 5 min after intubation and 10 min after intubation in patients of group LB when compared with patients of group LG (P<0.05) (Table 8).

Table 5

Comparison of heart rate in present study

Heart rate	Group LB		Group LG		P value
	Mean	SD	Mean	SD	
Before intubation	73.43	4.17	83.40	6.71	<0.001
After intubation					
1 min	76.03	5.60	96.37	11.18	<0.001
3 min	74.26	5.55	92.49	11.38	<0.001
5 min	72.23	5.93	87.20	9.55	<0.001
10 min	70.80	4.93	83.11	7.48	<0.001

Table 6

Systolic blood pressure in the present study

SBP	Group LB		Group LG		P value
	Mean	SD	Mean	SD	
Before intubation	112.83	8.23	111.14	6.54	0.346
After intubation					
1 min	118.77	7.12	131.11	8.62	<0.001
3 min	116.57	7.51	127.83	7.95	<0.001
5 min	114.20	7.48	125.09	8.11	<0.001
10 min	111.60	7.29	121.60	7.52	<0.001

Table 7

Diastolic blood pressure in the present study

DBP	Group LB		Group LG		P value
	Mean	SD	Mean	SD	
Before intubation	73.14	6.69	73.80	6.36	0.675
After intubation					
1 min	79.66	5.31	88.40	5.93	<0.001
3 min	76.29	4.75	87.09	6.22	<0.001
5 min	74.63	4.12	84.46	5.96	<0.001
10 min	73.60	3.34	80.77	4.38	<0.001

Table 8

Comparison of mean arterial pressure

MAP	Group LB		Group LG		P value
	Mean	SD	Mean	SD	
Before intubation	86.57	6.59	85.09	6.46	0.345
After intubation					
1 min	92.80	5.37	102.89	6.44	<0.001
3 min	89.80	4.84	100.57	6.42	<0.001
5 min	87.77	4.51	97.74	6.17	<0.001
10 min	86.54	3.74	94.31	5.07	<0.001

4. Discussion

Hence current study was done to compare the effects of intravenous labetalol and intravenous lignocaine in attenuating hemodynamic stress response due to laryngoscope and endotracheal intubation. In the current study, the majority of patients (45.7 %) belong to the age group of 41 to 50 years, followed by 22.9 % of patients belonging to the age group of 31 to 40 years, 20 % of patients belonging to the age group of 21 to 30 years and 11.4 % of patients belong to age group of 11 to 20 years with mean age of 31.46±10.35 years and minimum age of 18 years and maximum age of 48 years in group LB. The majority of patients (31.4 %) belong to the age group of 21 to 30 years, followed by 28.6 % of patients belonging to the age group of 41 to 50 years, 25.7 % of patients belonging to the age group of 31 to 40 years, and 14.3 % of patients belong to age group of 11 to 20 years with mean age of 32.77±9.41 years and minimum age of 18 years and maximum age of 46 years (p>0.05). A study by Kumar R et al. [6] showed that the mean age of the patients in group L1 was 42.0±10.0 years, the mean age of the patients in group L2 was 41.0±12.0 years, and the mean age of the patients in group C was 42.0±12.0 years.

A study by Ekta R et al. [7] showed that the mean age of the patients in group E was 41.12±10.23 years, the mean age of the patients in group LB was 42.32± ±10.63 years, and the mean age of the patients in group LG was 39.4±8.27 years which was statistically not significant (P value 0.57).

A study by Kaladhar S et al. [8] showed that the mean age of the patients of group LB was 34.6 years, and the mean age of the patients of group LG was 36.1 years. A study done by Kiran KH et al. [9] showed that the mean age of the patients in group LG was 40.38± ±7.25 years, the mean age of the patients in group LB was 43.8±9.24 years, and the mean age of the patients in group E was 42.56±8.71 years.

In the current study, 62.9 % of patients were males and 37.1 % of patients were females in group LB whereas 54.3 % of patients were males, and 45.7 % of patients were females in group LG. There was no statistical significance (P value 0.467). A study done by Kumar R et al. [6] showed that 72 % of patients were males and 28 % of patients were females in group L1, 76 % of patients were males, and 24 % of patients were females in group L2, and 72 % of patients were males and 24 % of patients were females in group C.

A study by Ekta R et al. [7] showed that 60 % of patients were males and 40 % of patients were females in group E, 56 % of patients were males and 44 % of patients were females in group LB and 52 % of patients were males and 48 % of patients were females in group LG which was statistically not significant (P value 0.08).

A study by Atit K et al. [10] showed that 36 % of patients were males and 64 % of patients were females in group 1, 44 % of patients were males and 56 % of patients were females in group 2, and 24 % of patients were males and 76 % of patients were females in group 3 where there was no statistical significance (P value 0.327). A study done by Kaladhar S et al. [8] showed that 52 % of patients were males and 48 % of patients were females in group LB whereas 52 % of patients were males and 48 % of patients were females in group LG.

A study by Kiran KH et al. [9] showed that 56.7 % of patients were males and 43.3 % of patients were females in group LG, 63.3 % of patients were males and 36.7 % of patients were females in group LB and 53.3 % of patients were males and 46.7 % of patients were females in group E.

In the current study, 82.9 % of patients belong to ASA grade I and 17.1 % of patients belong to ASA grade II in group LB, whereas 85.7 % of patients belong to ASA grade I and 14.3 % of patients belong to ASA grade II in group LG. There was no statistical significance (P value 0.743).

In the current study, the mean weight of the patients in group LB was 58.49±6.17 kg, and the mean weight of the patients in group LG was 56.17±5.52 kg. There was no statistical significance (P value 0.103). A study done by Kumar R et al. [6] showed that the mean weight of the patients in group L1 was 52.0±10.0 kg, the mean weight of the patients in group L2 was 51.0± ±11.0 kg, and the mean weight of the patients in group C was 50.0±11.0 kg. A study done by Ekta R et al. [7] showed that the mean weight of the patients in group E was 58.08±6.62 kg, the mean weight of the patients in group LB was 61.48±9.35 kg, and the mean weight of the patients in group LG was 61.76±6.71 kg which was statistically not significant (P value 0.73).

A study by Atit K et al. [10] showed that the mean weight of the patients in group 1 was 56.6±6.81 kg, the mean weight of the patients in group 2 was 55.88±8.45k g, and the mean weight of the patients in group 3 was 57.64±5.64 kg where there was no statistical significance (P value 0.677). A study by Kaladhar S et al. [8] showed that the mean weight of the patients in group LB was 57.7 kg, and the mean weight of the patients in group LG was 56.4 kg. A study by Kiran KH et al. [9] showed that the mean weight of the patients in group LG was 62.41±7.32 kg, the mean weight of the patients in group LB was 63.63±8.11 kg, and the mean weight of the patients in group E was 60.74±6.92 kg.

In the current study, the mean height of the patients in group LB was 161.6±5.7 cm, and the mean height of the patients in group LG was 159.54±4.27 cm. There was no statistical significance (P=0.092).

A study by Kumar R et al. [6] showed that the mean height of the patients in group L1 was 155.0± ±10.0 cm, the mean height of the patients in group L2 was 156.0±12.0 cm, and the mean height of the patients in group C was 154.0±11.0 cm.

In the current study, the mean BMI of the patients in group LB was 22.33±1.36 kg/m^2, and the mean BMI of the patients in group LG was 21.99±1.62 kg/m^2. There was no statistical significance (P = 0.907).

In the current study, 77.1 % of patients had a modified Mallampati score of class I and 22.9 % of patients had a modified Mallampati score of class II in group LB whereas 74.3 % of patients had a modified Mallampati score of class I and 25.7 % of patients had modified Mallampati score of class II. There was no statistical significance (P = 0.780).

In the current study, the mean duration of laryngoscopy in patients of group LB was 14.89 ± 1.83 sec, whereas the mean duration of laryngoscopy in patients of group LG was 15.57 ± 3.49 sec.

There was no statistical significance (P=0.307).

The mean systolic blood pressure, mean diastolic blood pressure and mean arterial blood pressure in group LG which was statistically not significant (P=0.211). A study by Kumar R et al. [6] showed that the mean heart rate in patients of group L1 was 82.44±6.3, and the mean heart rate in patients of the group was not statistically significant during baseline (P>0.05). The mean systolic blood pressure and mean diastolic blood in patients of group L1 and group L2, and group C were not statistically significant (P>0.05). Our study is in coincidence with studies of Ekta R et al. [7] Kaladhar S et al. [8], and Kiran KH et al. [9].

In the current study, after injecting the study drug, the mean heart rate was 65.97±5.22 per min in group LB whereas the mean heart rate was 76.66±8.49 per min in group LG which was statistically significant (P<0.001). The mean systolic blood pressure was 118.06±8.99 mm of hg in group LB whereas the mean systolic blood pressure was 115.89±8.89 mm of hg in group LG which was statistically not significant (P=0.313). The mean diastolic blood pressure was 76.40±7.32 mm of hg in group LB whereas the mean diastolic blood pressure was 76.31±6.15 mm of hg in group LG which was statistically not significant (P=0.958). The mean arterial blood pressure was 90.17±6.95 mm of hg in group LB whereas the mean arterial blood pressure was 88.06±6.54 mm of hg in group LG which was statistically not significant (P=0.195). The mean SPO^2 in patients of group LB was 99.40±0.49, whereas the mean SPO2 in patients of group LG was 99.60±0.49, which was statistically not significant (P=0.097). Our study is in agreement with studies of Ekta R et al. [7] Kaladhar S et al. [8], Kiran KH et al. [9]

In the current study, the mean heart rate was significantly reduced in patients of group LB compared to patients of group LG (P<0.05). A study done by Kumar R et al. [6] showed that heart rate was observed during intubation, 1 min, 3 min, 5 min and 10 min after intubation. There was a statistically significant attenuation of heart rate among patients of group L2 when compared with patients of group L1 and group C (P<0.05).

A study by Ekta R et al. [7] showed that heart rate was recorded 1min, 3min, 5min, 7 min and 10 min after intubation. There was statistically significant attenuation of heart rate in patients of group LB when compared with patients of group LG and group C (P<0.05). A study by Kaladhar S et al. [8] showed that there was a statistically significant attenuation of heart rate among patients of group LB when compared with patients of group LG (P<0.05). A study by Kiran KH et al. [9, 10] showed that heart rate was recorded during laryngoscope, 1min, 5min and 10min after intubation. There was significant attenuation of heart rate in patients of group LB when compared with patients of group LG and group E (P<0.05).

In the current study, mean systolic blood pressure was comparable in patients among the study groups before intubation (P=0.346). There was significantly reduced systolic blood pressure at 1min after intubation, 3min after intubation, 5 min after intubation, and 10 min after intubation in patients of group LB when compared with patients of group LG (P<0.05).

A study by Kumar R et al. [6] showed that systolic blood pressure was recorded at the time of intubation, 1 min, 3 min, 5 min and 10 min after intubation. Mean systolic pressure was comparable in patients among the study groups L1 and L2 (P>0.05) at the time of intubation and 1 min after intubation. 3 min, 5 min and 10 min after intubation, the mean systolic blood pressure was significantly attenuated in patients of group L2 when compared with patients of group L1 and group C (P<0.05).

A study by Ekta R et al. [7] showed that systolic blood pressure was recorded 1 min, 3 min, 5 min, 7 min and 10 min after intubation. There was statistically significant attenuation of systolic blood pressure in patients of group LB when compared with patients of group LG and group C (P<0.05).

A study by Kaladhar S et al. [8] showed that there was statistically significant attenuation of systolic blood pressure among patients of group LB when compared with patients of group LG (P<0.05).

A study by Kiran KH et al. [9] showed that SBP was recorded during laryngoscope, 1min, 5min and 10min after intubation. There was significant attenuation of SBP in patients of group LB when compared with patients of group LG and group E (P<0.05).

In the current study, diastolic blood pressure was recorded at the time of induction, 1 min after intubation, 3 min after intubation, 5 min after intubation and 10 min after intubation. Mean diastolic blood pressure was comparable in patients among the study groups before intubation (P = 0.675). There was significantly reduced diastolic blood pressure at 1min after intubation, 3min after intubation, 5 min after intubation, and 10 min after intubation in patients of group LB when compared with patients of group LG (P<0.05).

A study by Kumar R et al. [6] showed that diastolic blood pressure was recorded at the time of intubation, 1 min, 3 min, 5 min and 10 min after intubation. Mean diastolic pressure was comparable in patients among the study groups L1 and L2 (P>0.05) at the time of intubation and 1min after intubation. 3 min, 5 min and 10 min after intubation, the mean diastolic blood pressure was significantly attenuated in patients of group L2 when compared with patients of group L1 and group C (P<0.05).

A study by Ekta R et al. [7] showed that diastolic blood pressure was recorded 1min, 3min, 5min, 7min and 10min after intubation. There was no statistically significant difference in mean diastolic blood pressure in patients of the study groups (P>0.05). A study done by Kaladhar S et al. [8] showed that There was statistically significant attenuation of diastolic blood pressure among patients of group LB when compared with patients of group LG (P<0.05). A study by Kiran KH et al. [9] showed that DBP was recorded during laryngoscope, 1min, 5min and 10min after intubation. There was significant attenuation of DBP in patients of group LB when compared with patients of group LG and group E (P<0.05). In the current study, mean arterial pressure was recorded before intubation, 1 min after intubation, 3 min after intubation, 5 min after intubation and 10 min after intubation. Mean arterial blood pressure was comparable

in patients among the study groups before intubation (P=0.345). There was significantly reduced mean arterial pressure at 1 min after intubation, 3 min after intubation, 5 min after intubation and 10 min after intubation in patients of group LB when compared with patients of group LG (P<0.05).

A study by Kumar R et al. [6] showed that mean arterial pressure was recorded at the time of intubation, 1 min, 3 min, 5 min and 10 min after intubation. Mean arterial pressure was comparable in patients among the study groups L1 and L2 (P>0.05) at the time of intubation and 1min after intubation. 3min, 5min and 10 min after intubation, the mean arterial pressure was significantly attenuated in patients of group L2 when compared with patients of group L1 and group C (P<0.05).

A study by Ekta R et al. [7] showed that mean arterial pressure was recorded 1 min, 3 min, 5 min, 7 min and 10 min after intubation. There was statistically significant attenuation of mean arterial pressure in patients of group LB when compared with patients of group LG and group C (P<0.05).

A study by Kaladhar S et al. [8] showed that there was statistically significant attenuation of mean arterial pressure among patients of group LB when compared with patients of group LG (P value <0.05). A study by Kiran KH et al. [9] showed that MAP was recorded during laryngoscope, 1 min, 5 min and 10 min after intubation. There was significant attenuation of MAP in patients of group LB when compared with patients of group LG and group E (P<0.05).

The limitations of the present study were the restricted study population and that we did not include patients that underwent elective surgeries. These items might be important and effective on types of hemodynamic responses in patients. Altogether, we conclude that 0.2 mg/kg labetalol was more effective than 0.1 mg/kg labetalol in providing stabilized hemodynamics during extubation. We recommend that anesthesiologists should pay more attention to the properties of 0.25 mg/kg labetalol.

Prospects for further research. The use of labetalol, as well as research comparing the application of both labetalol and lignocaine for patients with underlying disorders, are, on the other hand, little studied. It is thus necessary to do more research on the use of lignocaine and labetalol as an analgesic and prophylactic measures in patients undergoing intubation.

5. Conclusion

It was concluded in the present study that intravenous labetalol of dosage 0.25 mg/kg before laryngoscopy and endotracheal intubation was efficient in attenuating sympathomimetic responses of heart rate, systolic blood pressure, diastolic blood pressure and mean arterial pressure. Intravenous lignocaine dosage of 1 mg/kg before intubation was not significantly effective in reducing the increase in heart rate and blood pressure, which was due to laryngoscopy and endotracheal intubation. Hence, labetalol may be beneficial for patients undergoing general anaesthesia for stable cardio-vascular responses during endotracheal intubation.

Conflict of interest

The authors declare that there is no conflict of interest in relation to this paper, as well as the published research results, including the financial aspects of conducting the research, obtaining and using its results, as well as any non-financial personal relationships.

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Data availability

Data will be made available on reasonable request.

References

1. Sanjeev, O., Ratnani, E., Singh, A., Tripathi, M., Chourasia, H. (2017). A comparative study of intravenous esmolol, labetalol and lignocaine in low doses for attenuation of sympathomimetic responses to laryngoscopy and endotracheal intubation. Anesthesia: Essays and Researches, 11 (3), 745–750. doi: https://doi.org/10.4103/aer.aer_9_17

2. Kewalramani, A., Partani, S., Sharma, N. P., Sharma, V. (2016). Comparison of labetalol versus dexmedetomidine to assess the haemodynamic responses to laryngoscopy and intubation during induction of general anaesthesia – A prospective, randomized, controlled study. Indian Journal of Clinical Anaesthesia, 3, 512–517.

3. Srivastava, V., Agrawal, S., Gautam, S. K., Ahmed, M., Sharma, S., Kumar, R. (2015). Comparative evaluation of esmolol and dexmedetomidine for attenuation of sympathomimetic response to laryngoscopy and intubation in neurosurgical patients. Journal of Anaesthesiology Clinical Pharmacology, 31 (2), 186–190. doi: https://doi.org/10.4103/0970-9185.155146

4. Talke, P. (2017). The Effect of Tracheal Intubation-Induced Autonomic Response on Photoplethysmography. Anesthesiology Research and Practice, 2017, 1–5. doi: https://doi.org/10.1155/2017/7646541

5. Lakhe, G., Pradhan, S., Dhakal, S. (2021). Hemodynamic Response to Laryngoscopy and Intubation Using McCoy Laryngoscope: A Descriptive Cross-sectional Study. Journal of Nepal Medical Association, 59 (238). doi: https://doi.org/10.31729/jnma.6752

6. Kumar, R., Gandhi, R., Mallick, I., Wadhwa, R., Adlakha, N., Bose, M. (2016). Attenuation of hemodynamic response to laryngoscopy and endotracheal intubation with two different doses of labetalol in hypertensive patients. Egyptian Journal of Anaesthesia, 32 (3), 339–344. doi: https://doi.org/10.1016/j.egja.2016.04.004

7. Sanjeev, O., Ratnani, E., Singh, A., Tripathi, M., Chourasia, H. (2017). A comparative study of intravenous esmolol, labetalol and lignocaine in low doses for attenuation of sympathomimetic responses to laryngoscopy and endotracheal intubation. Anesthesia: Essays and Researches, 11 (3), 745. doi: https://doi.org/10.4103/aer.aer_9_17

8. Korukonda, V., Kaladhar, S. (2020). Attenuation of haemodynamic response to laryngoscopy and endotracheal intubation a comparative study between I.V. labetalol and I.V. lignocaine. Indian Journal of Clinical Anaesthesia, 7 (4), 676–680. doi: https://doi.org/10.18231/j.ijca.2020.121

9. Kiran Kumar, Dr. H. (2019). Comparison of esmolol, labetalol and lignocaine for attenuation of sympathomimetic responses to laryngoscopy and endotracheal intubation. International Journal of Medical and Biomedical Studies, 3 (7). doi: https://doi.org/10.32553/ijmbs.v3i7.415

10. Kumar, A., Mishra, P. K., Shukla, S. (2017). A randomized, controlled study to compare the effects of intravenous labetalol and esmolol on haemodynamic changes during laryngoscopy and intubation. International Journal of Research in Medical Sciences, 5 (9), 4003–4007. doi: https://doi.org/10.18203/2320-6012.ijrms20173971

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Hanumanla Baby Rani*, Professor and HOD, Department of Anesthesia, Gandhi Medical College Musheerabad, Padmarao Nagar, Secunderabad, Telangana, India, 500003

Chikkam Yamini, Post Graduate, Department of Anesthesia, Gandhi Medical College Musheerabad, Padmarao Nagar, Secunderabad, Telangana, India, 500003

***Corresponding author:** Hanumanla Baby Rani, e-mail: ranisarvepalli9@gmail.com*