A CLINICAL STUDY OF INTRAVENOUS DEXMEDETOMIDINE AND INTRAVENOUS CLONIDINE FOR ATTENUATION OF HAEMODYNAMIC RESPONSES TO LARYNGOSCOPY & INTUBATION

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ABSTRACT

INTRODUCTION

The present work is a prospective clinical study comparing the effects of IV dexmedetomidine and IV Clonidine on attenuation of haemodynamic parameters during laryngoscopy and intubation in patients undergoing elective open cholecystectomy operation under general anaesthesia.

MATERIALS & METHODS

The present study was conducted in the Department of Anaesthesiology of Assam Medical College, Dibrugarh for a period of one year from July 2014 to June 2015 on patients undergoing elective open cholecystectomy at operation theatres of Department of General Surgery of Assam Medical College and Hospital, Dibrugarh. They were divided into two groups with 60 cases in each group by matching patient's age, sex and ASA grading. Group D-(dexmedetomidine group); in this group patients received 1 mcg/kg dexmedetomidine IV, 15 mins before laryngoscopy and intubation. Group C-(Clonidine group); all the patients in this group received 1 mcg/kg of Clonidine IV, 15 minutes before laryngoscopy and intubation.

RESULTS

The incidence of bradycardia was more in dexmedetomidine group; however, it was not statistically significant. With the present study Inj. dexmedetomidine at a dose of 1 mcg/kg IV was able to prevent adverse haemodynamic changes better than Inj. Clonidine 1 mcg/kg IV prior to laryngoscopy and intubation during elective surgeries under general anaesthesia.

CONCLUSION

From the findings of this study, we can come to a conclusion that IV bolus dose of dexmedetomidine 1 mcg/kg administered 15 minutes prior to laryngoscopy and intubation can attenuate the sympathetic response to laryngoscopy and intubation without any major side effects of the drug, in otherwise healthy patients undergoing elective surgeries under general anaesthesia.

KEYWORDS

IV Dexmedetomidine, Intravenous Clonidine, Attenuation, Intubation Laryngoscopy, Haemodynamic Response.

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INTRODUCTION: After the introduction of endotracheal anaesthesia in the last quarter of 19th century, endotracheal intubation has become one of the frequently performed procedures in the practice of anaesthesia. Laryngoscopy and intubation involves manipulation of airway and the sensory part of the airway is of great concern during the manipulation. The circulatory responses to laryngeal and tracheal stimulation following laryngoscopy and intubation were documented by Reid and Brace, 1940 and King et al 1951 and interpreted as reflex sympathoadrenal stimulation.[1]

The process of laryngoscopy and intubation are noxious stimuli and therefore constitute a period of extreme haemodynamic stress and is associated with intense sympathetic activity marked by tachycardia and hypertension.[1]

The cardiovascular response is a reflex phenomenon, which is mediated by the Vagus (X) and Glossopharyngeal nerve (IX). Vagus and Glossopharyngeal carry the afferent stimulus from epiglottis and infraglottic region and activate the vasomotor centre to cause a peripheral sympathetic adrenal response to release adrenaline and noradrenaline which causes the effect.[2]

The increase in heart rate and blood pressure are transitory, variable and unpredictable. Normal individuals can tolerate this response but in susceptible individuals, this transient sympathetic response can evoke life threatening conditions.[3] Hence to overcome these undesirable responses, multiple pharmacological and non-pharmacological strategies have been studied to minimise the hemodynamic adverse response by acting at different levels of the reflex arc.

None of these techniques are completely effective, so there has been a focus on the use of α2-adrenergic agonists. These drugs by virtue of their sympatholytic (i.e.

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antihypertensive and negative chronotropic) action, attenuate the hemodynamic response following laryngoscopy and endotracheal intubation. These drugs also have sedative, anxiolytic and analgesic effects, which are an added benefit. Dexmedetomidine is currently used in the ICU for sedation and analgesia in mechanically ventilated patients and produces rapid recovery after discontinuation.

Hence considering the adverse effects associated with laryngoscopy and intubation, dexmedetomidine 1 mcg/kg IV and Clonidine 1 mcg/kg IV have been chosen to find out the effectiveness in suppressing the hemodynamic responses to laryngoscopy and endotracheal intubation.

AIM & OBJECTIVES: The aim of the study is to evaluate and compare the efficacy of single premedication dose of dexmedetomidine 1 mcg/kg IV and Clonidine 1 mcg/kg IV. In attenuation of haemodynamic responses to laryngoscopy and endotracheal intubation, and side effects, if any.

MATERIALS & METHODS: It was a prospective clinical study. This study was conducted after the approval from the Institutional Ethics Committee and with written informed consent from each patient after explaining the study procedure to them in their own language.

Inclusion Criteria: Patients aged between 20–50 yrs. of both the sexes. Patients scheduled for elective open cholecystectomy surgeries under general anaesthesia. Patients with ASA grade 1 or 2. Grade 1-Normal Healthy Patients. Grade 2-Patients with Mild Systemic Disease. Mallampati airway assessment of grade 1.

Exclusion Criteria: Unwilling patients, emergency surgeries, anticipated difficult intubation, Patients with ASA grade III or higher. Patients with neurological and other endocrine abnormalities. Patients with renal impairment and hepatic disease. Patients with cardiovascular diseases, diabetes mellitus, asthma COPD, etc. Patients on beta blockers or calcium channel blockers. Patients on psychotropic drugs or history of drug allergies. Patients with language or communication difficulties. Previous records of failed intubation.

Sample Size: A total of 120 adult patients of either sex between the age group of 20 to 50 years of ASA-1 and ASA-2 undergoing elective open cholecystectomy were divided randomly by sequentially numbered opaque sealed envelope method, into two groups of 60 patients each.

Group–D (Dexmedetomidine group) In this group, patients received 1 mcg/kg dexmedetomidine IV in 100 mL 0.9% normal saline given in 10 mins, 15 mins before laryngoscopy and intubation.

Group-C (Clonidine group) All the patients in this group received 1 mcg/kg of Clonidine IV in 100 mL 0.9% normal saline given in 10 mins, 15 minutes before laryngoscopy and intubation.

All pre-anaesthetic evaluation was performed in each patient including detailed history taking, thorough physical examination and routine preoperative investigations. The nature and procedure of the study was explained to the patients. All patients had routine preoperative fasting for 6 hours before surgery.

Investigation:

1. Hb%, TC, DC, and ESR.
2. RBS.
3. Blood urea, serum creatinine & Liver Function Test.
4. ECG.
5. Chest x-ray.

Statistical Analysis: The data were recorded on predesigned and pretested proforma, and was tabulated and master chart was prepared. Demographic data, Heart Rate (HR), systolic BP, diastolic BP and Mean arterial pressure (MAP) were tabulated as Mean ± SD. Statistical significance were tested by Student 't' test and Fisher's exact test wherever applicable using the computer program Graph Pad Instat. Microsoft Word and Excel have been used to generate graphs and tables. p value of less than 0.05 was considered significant.

RESULTS & OBSERVATIONS: The present work is a prospective clinical study comparing the effects of IV Dexmedetomidine and IV Clonidine on attenuation of haemodynamic parameters during laryngoscopy and intubation in patients undergoing elective open cholecystectomy operation under general anaesthesia.

Group	Total numbers
Group D	60
Group C	60

Table 1: Showing count distribution

Age group (in years)	Dexmedetomidine (Group–D)		Clonidine (Group–C)	
	n	%	n	%
20—30	34	56.67	33	55.00
31—40	25	41.67	26	43.33
41—50	1	1.67	1	1.67
Total	**60**	**100.00**	**60**	**100.00**

Table 2: Showing age distribution

	Age (Mean±SD)	P Value
GROUP D	29.13±6.51	0.9060
GROUP C	29.27±6.45	

Table 3: Showing age comparison

The mean age of patients in group D was 29.13±6.51 years and in group C it was 29.27±6.45 years with a p value more than 0.05 and hence both the groups were comparable in relation to age distribution.

Sex	Dexmedetomidine (Group–D)		Clonidine (Group–C)	
	n	%	n	%
Male	29	48.33	29	48.33
Female	31	51.67	31	51.67
Total	**60**	**100.00**	**60**	**100.00**

Table 4: Showing sex distribution

In Group D, 48.33% were males and 51.67% were females and in Group C, 48.33% were males and 51.67% were females. Hence, both the groups were comparable in relation to sex distribution.

Weight Group (Kg)	Dexmedetomidine (Group–D)		Clonidine (Group–C)	
	n	%	n	%
40-50	19	31.67	10	16.67
51-60	22	36.67	28	46.67
61-70	19	31.67	22	36.67
Total	**60**	**100.00**	**60**	**100.00**

Table 5: Showing weight distribution

Group	Weight (Kg) Mean±SD	P Value
Group D	56.81±8.89	0.2501
Group C	58.56±7.56	

Table 6: Showing weight comparison

The mean weight of patients in Group D was 56.81±8.89 kg and in Group C was 58.56±7.56 kg with p value of more than 0.05 which is not significant and hence both the groups were comparable.

Group	ASA I	Percentage	ASA II	Percentage	P value
Group D	29	48.33	31	51.00	0.5312
Group C	27	45	33	51.66	
Total	**56**	**46.66**	**64**	**51.33**	

Table 7: Showing ASA physical status of patients

From the above table, 46.66% belonged to ASA 1 and 51.33% belonged to ASA 2 physical status. In group D 48.33% were of ASA 1 in comparison to 45% in Group C. Patients having ASA 2 comprised of 51.0% in Group D and 51.66% in Group C. The p value is 0.5312 and hence, both the groups were comparable with respect to ASA physical status.

Tables Showing Haemodynamic Parameters:

Time interval	HR (Mean±SD)	SBP (Mean±SD)	DBP (Mean±SD)	MAP (Mean±SD)
TI	81.01±10.10	122.26±9.81	76.28±9.56	91.61±8.46
T2	71.02±10.60	113.22±9.81	68.43±9.85	83.36±9.31
T3	80.40±11.70	123.05±8.83	74.93±10.37	90.97±8.03
T4	77.8±10.53	118.26±9.98	69.06±9.67	85±47±8.60
T5	75.73±9.69	115.35±8.64	64.33±7.89	81.34±6.84
T6	75.2±10.25	115.11±8.48	63.00±8.22	80.37±7.10
T7	75.3±10.61	114.35±9.12	71.23±7.67	85.61±6.91

Table 8: Group D: Dexmedetomidine

Time interval	HR (Mean±SD)	SBP (Mean±SD)	DBP (Mean±SD)	MAP (Mean±SD)
T1	77.95±7.38	119.50±8.47	79.2±7.33	92.63±6.35
T2	74.22±5.93	109.31±9.19	78.96±6.96	89.08±6.19
T3	86.06±7.50	126.4±8.97	87.96±6.93	100.78±6.91
T4	83.03±8.01	122.1±10.46	86.13±6.74	98.12±6.97
T5	81.23±7.07	118.83±10.03	83.3±7.61	95.19±7.68
T6	78.56±6.88	119.06±10.52	81.1±7.51	93.76±7.51
T7	78.68±6.47	118.48±12.24	81.2±8.01	93.63±7.55

Table 9: Group C: Clonidine

Time interval	Group D (Mean±SD)	Group C (Mean±SD)	P value	Significance
T1	81.01±10.10	77.95±7.38	0.0606	NS
T2	71.02±10.60	74.22±5.93	0.0378	S
T3	80.40±11.70	86.06±7.50	0.0020	S
T4	77.8±10.53	83.03±8.01	0.0027	S
T5	75.73±9.69	81.23±7.07	0.0006	S
T6	75.2±10.25	78.56±6.88	0.0371	S
T7	75.3±10.61	78.68±6.47	0.0373	S

Table 10: Comparison between intraoperative heart rate (per minute) changes

The table shows intraoperative heart rate changes of patients at various intervals of the procedure. In Group D, the changes were found at lower level as compared to Group C except for baseline reading where it was statistically insignificant.

The maximum rise in HR immediately after intubation in Group C was 11.85/min. whereas in Group D it was only 09.37/min. which was significant. The intra-group variation of heart rate was found to be more stable in Group D than that of Group C which showed wide range of variation during the whole intra-operative period.

SBP (mmHg)	Group D (Mean±SD)	Group C (Mean±SD)	P value	Significance
T1	122.26±9.81	119.5±8.47	0.1017	NS
T2	113.22±9.81	109.31±9.19	0.0261	S
T3	123.05±8.83	126.4±8.97	0.0414	S
T4	118.26±9.98	122.1±10.46	0.0419	S
T5	115.35±8.64	118.83±10.03	0.0440	S
T6	115.11±8.48	119.06±10.52	0.0254	S
T7	114.35+9.12	118.48±12.24	0.0382	S

Table 11: Comparison between systolic blood pressure changes in Group D and Group C

The above table shows intraoperative systolic blood pressure changes of patients of Group D which were found to be significantly lower level as compared to Group C at various intraoperative periods of the procedure except for the preoperative level.

The maximum rise in SBP immediately after intubation was 17.09 mmHg and 9.83 mmHg in Group C and D respectively. This signifies that dexmedetomidine effectively obtunded the rise in SBP as compared to Clonidine. The SBP were found to be more stable in Group D than Group C during intra-operative period.

DBP (mmHg)	Group D (Mean±SD)	Group C (Mean±SD)	P value	Significance
T1	76.28±9.59	79.2±7.33	0.0639	NS
T2	68.43±9.85	78.96±6.96	0.0001	S
T3	74.93±10.37	87.96±6.93	0.0001	S
T4	69.06±9.67	86.13±6.74	0.0001	S
T5	64.33±7.89	83.36±7.61	0.0001	S
T6	63.00±8.22	81.10±7.51	0.0001	S
T7	71.23±7.67	81.20±8.01	0.0001	S

Table 12: Comparison between diastolic blood pressure changes in Group D and Group C

The table indicates that intraoperative diastolic blood pressure changes of Group D patients were at significantly lower level as compared to Group C at various intraoperative periods of the procedure except for baseline level.

The DBP difference was maximum immediately after and prior to intubation which was found to be 9 mmHg and 6.5 mmHg for Group C and D respectively. This shows that hemodynamic effects maintained better in Group D during laryngoscopy and intubation.

DBP (mmHg)	Group D (Mean±SD)	Group C (Mean±SD)	P value	Significance
T1	91.61±8.46	92.63±6.35	0.4566	NS
T2	83.36±9.31	89.08±6.19	0.0001	S
T3	90.97±8.03	100.78±6.91	0.0001	S
T4	85.47±8.60	98.12±6.97	0.0001	S
T5	81.34±6.84	95.19±7.68	0.0001	S
T6	80.37±7.10	93.76±7.51	0.0001	S
T7	85.61±6.91	93.63±7.55	0.0001	S

Table 13: Comparison between mean arterial pressure changes in Group D and Group C

Finally, the above table shows that mean arterial pressure changes of Group D patients were at significantly at lower level as compared to Group C at various intraoperative periods of the procedure.

The MAP difference was maximum immediately after and laryngoscopy and intubation which was 7.61 mmHg in case of Group D, and 11.7 mmHg in case of Group C. This shows that hemodynamic effects was maintained better in Group D during laryngoscopy and intubation.

Adverse Effects:

Group	Bradycardia		p value
	Count	Percent	
Dexmedetomidine	6	10%	0.1140
Clonidine	1	2%	
Total	**60**	**60**	

Table 14: Showing adverse effect

Bradycardia was noticed in 6 patients in dexmedetomidine group, and in 1 patient in Clonidine group, which was treated with inj. Atropine. But was not statistically significant.

DISCUSSION: Laryngoscopy and tracheal intubation are considered as the most critical events during administration of general anaesthesia. The process of laryngoscopy and tracheal intubation provoke transient, but marked sympathoadrenal response manifesting as hypertension and tachycardia.[1]

Normal individuals can tolerate this transient but marked sympathoadrenal response manifesting as hypertension and tachycardia well, but in patients with cardiovascular compromise like hypertension, ischaemic heart disease, cerebrovascular disease and in patients with intracranial aneurysms even these transient changes in haemodynamics can result in potentially harmful effects like left ventricular failure, pulmonary oedema, myocardial ischemia, ventricular dysrhythmias and cerebral haemorrhage.[3] This is by far the most important indication for attenuation of haemodynamic response to laryngoscopy and tracheal intubation.[4]

Several attempts have been made to block the peripheral sensory receptors and afferent input by topical application of local anaesthetics (LA).[5,6] It has also been tried to block the central mechanisms of integration of sensory input by using intravenous (IV) fentanyl, morphine, etc. The efferent pathway and effector sites have been blocked by using IV lignocaine,[5] β-blockers,[7] calcium-chanel blocker.[8,9,10,] Vasodilators (sodium nitroprusside, nitrogycerin),[11,12] magnesium sulphate, etc. Other methods attempted at reducing the sympathoadrenal response include minimising mechanical stimuli of laryngoscopy by blind nasal intubation and reducing time of laryngoscopy to <15 seconds.

Dexmedetomidine is a highly selective α2 receptor agonist with an α2:α1 specificity of 1620:1.[13] The major sedative, hypnotic and antinociceptive effects of dexmedetomidine are attributed to its agonism of the presynaptic α2 adrenergic receptors in the locus coeruleus, which inhibits the release of norepinephrine terminating the propagation of pain signals and inhibits sympathetic activity, thus decreasing the BP & HR. Clonidine hydrochloride is an imidazoline derivative. It is a centrally acting adrenergic agonist that lowers blood pressure by decreasing basal sympathetic nervous system activity. It acts by selective stimulation post synaptic adrenergic receptors in the central nervous system, more specifically the nucleus solitarii of the medulla oblongata and reduction in catecholamine levels. This causes inhibition of basal efferent vasoconstrictor effects on the peripheral and renal vasculature.[14]

Hence, this study was undertaken to evaluate the efficacy of IV dexmedetomidine and IV clonidine in maintaining haemodynamic stability by reduction of laryngoscopy and intubation stress response in 120 patients undergoing open cholecystectomy surgeries under general anaesthesia at Assam Medical College & Hospital. The patients were divided into two groups viz. Group D receiving Inj. dexmedetomidine 1 mg/kg and Group C receiving Inj. Clonidine 1 mcg/kg.

In this study, 48.33% were males and 51.65% were females in Group D and 48.33% were males and 51.67 % were females in Group C. Hence, both the groups had compatible sex distribution. Most of the patients (group D 56.67% and group C 55%) in both the groups were aged between 20-30 years. The mean age of patients in Group D was 29.13±6.51 years and in Group C was 29.30±6.45 years with a p value more than 0.05 and hence both the groups were comparable. The mean weight of patients in Group D was 56.82±8.88 kg and in Group C was 58.55±7.56 kg with p value of more than 0.05 which is not significant and hence both the groups were comparable. In the whole study, 84.67% belonged to ASA 1 and 23% were having ASA 2 physical status. In Group, D 48.33% were of ASA 1 as compared to 45.0% in Group C. Patients having ASA 2 comprised 31.0% in Group D and 33.0% in Group C. The p value was 0.5312 and hence, both the groups were comparable with respect to ASA physical status.

Hence, all the demographic parameters were comparable in both the groups.

In another study, Anish Sharma NG[15] in 2014 conducted a study on premedication with IV dexmedetomidine vs IV Clonidine in attenuating the pressor responses during laryngoscopy and endotracheal intubation. In this study, 60 patients in the age group 20-40 years of either sex belonging to ASA grade 1 & 2 were randomly divided into 2 groups, each consists of 30 each. Group 1-dexmedetomidine, group 2 Clonidine. SBP, DBP, MAP, HR, SpO2 were recorded at 1 min. (T3), 3 min. (T4), 5 min. (T5) & 10 min. (T6) after laryngoscopy & intubation. They found that on an average HR decreased by 10-12 beats (T1) in both groups, maximum decrease in dexmedetomidine group was 30 beats and in Clonidine group 25 beats. At T3 (at 1 min. after intubation) maximum increase in HR in dexmedetomidine group was 18 beats/min. and in Clonidine group was 25 beats/min. at T4 (3 min. after intubation). Maximum increase in HR was 16 beats/min. in dexmedetomidine group and 22 beats/min. in Clonidine group. HR responses to intubation was higher in Clonidine group when compared to dexmedetomidine group which was statistically significant ($p<0.001$). On an average SBP, DBP, and MAP decreased by 18-22 mmHg, 14-18 mmHg, 14-16 mmHg respectively (T1) in both groups. There was slight increase in BP at intubation (T3) in both the groups (on an average SBP, DBP and MAP increased by 8-10 mmHg, 4-5 mmHg respectively), but it remained below the pre-induction values. At T4, T5, T6, BP displayed a downward trend and that was comparable in both the groups. HR, SBP, DBP, MAP returned to pre-induction values by 10 mins. of intubation.

Author concluded that both Clonidine and dexmedetomidine are effective in attenuating the stress response during laryngoscopy and intubation, but dexmedetomidine was more effective in attenuating the tachycardia response. This was again in favour of our study where dexmedetomidine in a dose of 1 microgram showed better responses in obtunding pressor responses to laryngoscopy and intubation than Clonidine.

Also recently, Sameer et al in 2014[16] did a study to compare the effects of dexmedetomidine (1 µg/kg) and Clonidine (1 µg/kg) on hemodynamic responses to endotracheal intubation, effect on anaesthetic requirements and effect on sedation. In this prospective double blind study, 60 patients scheduled for elective surgeries under general anaesthesia were randomly divided into two groups Group D (Inj. dexmedetomidine dose 1 µg/kg IV) and Group C (Inj. Clonidine dose 1 µg/kg IV). Patients belonging to ASA 1 & ASA 2 of both sexes aged 20-60 years, were included in this comparative randomised study. Pulse, blood pressure, ECG were monitored continuously and recorded before giving the study drug; and after giving the study drug at intubation, then at 1, 3, 5, 10 minutes after intubation. Data were analysed and $p<0.05$ was considered significant.

Dexmedetomidine group had 4.70% rise in heart rate at time of intubation and Clonidine group had 9.59% rise which was statistically significant ($p<0.05$) except during intubation, difference in heart rate between two groups was not significant. ($p>0.05$) Group C had significant rise in SBP and DBP during intubation compared to Group D. Maximum rise in SBP and DBP in Group C was 14.53% and 12.84% respectively whereas in Group D it was 5.55% and 8.90% respectively. Dexmedetomidine group had better sedation than Clonidine group ($p<0.05$).

Authors concluded dexmedetomidine significantly attenuated the sympathetic response of laryngoscopy and intubation as compared to Clonidine. The results of this study matched with our study where we noticed that dexmedetomidine and Clonidine in the same dose in this study was quite effective in attenuating the pressor responses during laryngoscopy and intubation.

Similar findings were found by S. Shanbagavalli, Shivashankar M et al[17] in 2014 who conducted a study to compare IV dexmedetomidine & IV Clonidine in attenuating the pressor responses during laryngoscopy & endotracheal intubation. Total of 60 patients in the age group 20-40 years, belonging to ASA grade 1 & 2 scheduled for elective procedures under GA randomly to receive either dexmedetomidine or Clonidine. Group 1 patients received Clonidine 3 µg/kg in 100 mL NS, 10 min. before induction and group 2 patients received dexmedetomidine 1 µg/kg in 100 mL NS, 10 min. before induction. HR, SBP, DBP, MAP were monitored at T0, T1, T2, T3, T4, T5, T6 respectively. Anaesthesia was maintained, O2, N2O, isoflurane and vecuronium at titrated doses. T0- basal reading when the patient is shifted to OT, T1-5 min. after infusion of dexmedetomidine/Clonidine, T2-at induction(2 min. after sleep dose of thiopentone sodium), T3- 1 min. after intubation, T4-3 min. after intubation, T5-5 min. after

intubation, T6-10 min. after intubation. They found that on an average, HR decreased by 10-12 beats (T1) in both groups. Maximum decrease in HR in dexmedetomidine group was 30 beats and in Clonidine 25 beats. At T3 (1 min. after intubation) maximum increase in heart rate in dexmedetomidine group was 18 beats/min. and in Clonidine group was 25 beats/min. At T4 (3 min. after intubation) maximum increase in HR was 16 beats/min. in dexmedetomidine group and 22 beats/min. in Clonidine group. HR responses to intubation was higher in Clonidine group when compared to dexmedetomidine group which was statistically significant ($p<0.001$). SBP, DBP and MAP decreased by 18-22 mmHg, 14-18 mmHg, 14-16 mmHg respectively (T1) in both the groups. There was slight increase in BP at intubation (T3) in both groups (on an average SBP, DBP and MAP increased by 8-10 mmHg, 6-8 mmHg, 4-5 mmHg respectively) but it remained below the pre-induction values. At T4, T5, T6, BP displayed a downward trend and that was comparable in both groups. HR, SBP, DBP, MAP returned to pre-induction value by 10 min. of intubation.

Authors came to the conclusion that both Clonidine and dexmedetomidine are effective in attenuating the stress response during laryngoscopy and intubation, but dexmedetomidine was more effective in attenuating the tachycardia response. This was again in favour of our study where dexmedetomidine obtunded better the pressor response of laryngoscopy and intubation than Clonidine.

LIMITATIONS OF THIS STUDY: Present study was done in a small group of 60 patients each in both the groups. All patients belonging to ASA 1 and 2 and most of the patients were from younger age-group. Patients with comorbid conditions like hypertension and diabetes, etc. were not included in the study. Hence, the advantages of using Clonidine or dexmedetomidine in patients having comorbid diseases could not be evaluated. The various drugs used in the present study are known to influence the haemodynamic changes which were not evaluated. The patients, who were put in this study were intubated successfully in the first attempt. Perhaps, the haemodynamic parameters would have shown a different picture in patients with difficult intubation.

Summary: Various pharmacological agents have been used to attenuate this response. Both dexmedetomidine and Clonidine have been found to be effective in attenuating this response and in maintaining hemodynamic stability during laryngoscopy and intubation.

The procedure was explained to the patient. After arrival of the patient to the operating room, ECG and heart rate were monitored continuously and non-invasive recordings of systolic, diastolic and mean arterial pressure at 5 min. intervals was done. A vein was cannulated for intravenous infusion and 150-200 mL of RL was administered before administration of the study drugs. The patient was premedicated with glycopyrrolate (0.2 mg), ondansetron (4 mg), ranitidine (50 mg) and tramadol (1.5 mg/kg). The patient was then pre-oxygenated with 100% oxygen for 3 mins. before induction with a tight fitting face mask. Anaesthesia was induced with Inj. propofol (2 mg/kg) IV and then Inj. succinylcholine was administered at a dose of 1–1.5 mg/kg IV.

Laryngoscopy was done using rigid laryngoscope with standard Macintosh blade and intubation was done with appropriate sized disposable, high volume, low pressure cuffed endotracheal tube. The patients were then ventilated with 66% nitrous oxide and 33%. Oxygen with a tidal volume of 8-10 mL/kg and a rate of 12–15 breaths per minute. For maintenance of relaxation, Inj. atracurium was administered according to body weight (0.5 mg/kg). Increase in blood pressure up to 20% of basal BP was managed by increasing isoflurane concentration and more than 20% of basal BP was managed by titrated nitroglycerin infusion. Systolic blood pressure, diastolic blood pressure, mean arterial pressure, heart rate were recorded at regular predetermined intervals. Any intra-operative or postoperative complications were noted and were managed accordingly.

With the present study, we may summarise that Inj. dexmedetomidine at a dose of 1 mcg/kg IV was able to prevent adverse haemodynamic changes better than Inj. Clonidine 1 mcg/kg IV prior to laryngoscopy and intubation during elective surgeries under general anaesthesia.

CONCLUSION: On the basis of our present clinical comparative study, we can come to a conclusion that Inj. dexmedetomidine 1 mcg/kg IV administered 15 minutes prior to laryngoscopy and intubation was able to prevent adverse haemodynamic changes resulting from laryngoscopy and intubation better than Inj. Clonidine 1 mcg/kg IV administered 15 mins prior to laryngoscopy and intubation during elective surgeries under general anaesthesia. Also, dexmedetomidine maintained a stable haemodynamic profile throughout the whole intra-operative period. Heart rate, systolic blood pressure as well as diastolic blood pressure were better maintained within normal limits by dexmedetomidine.

Dexmedetomidine was found to be more effective than Clonidine in attenuating the sympathetic response to laryngoscopy and intubation.

From the findings of this study, we can come to a conclusion that IV bolus dose of dexmedetomidine 1 mcg/kg administered 15 minutes prior to laryngoscopy and intubation can attenuate the sympathetic response to laryngoscopy and intubation without any major side effects of the drug in otherwise healthy patients undergoing elective surgeries under general anaesthesia.

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