

Dexmedetomidine and Clonidine on Induction, Hemodynamic and Cardiovascular Parameters for Intubation in General Anesthesia Cases a Comparative Study

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I. Aims And Objectives Of The Study:

The study was undertaken to compare the effects of Dexmedetomidine and Clonidine in attenuating hemodynamic response to laryngoscopy and intubation. This study was done in 90 patients divided into 3 groups

- To observe the variations in sympathetic response to laryngoscopy and intubation.
- To study effectiveness of
 - a) Dexmedetomidine 1mcg /kg bolus administration 10 minutes before laryngoscopy and intubation and
 - b) Clonidine 0.5mcg/kg administered 10 minutes before laryngoscopy and intubation in attenuating the sympathetic response.
 - c) And comparison of Dexmedetomidine and Clonidine in suppressing pressor response to intubation.

II. Patients & Methods Design:

This study “**comparison of effect of single dose dexmedetomidine and clonidine on induction, hemodynamic and cardiovascular parameters for intubation in general anesthesia cases**” was carried out after obtaining ethical committee clearance as well as written informed consent from all patients. 90 patients in the age group 20-50yrs of either sex, belonging to asa grade i or ii scheduled for elective surgical procedures under general anaesthesia were included.

Materials-

Dexmedetomidine (DEXMETOMID- 100µg/ml- 2ml ampoule)

Clonidine (CLONEON-150µg/ml-1ml ampoule)

Normal saline (100ml)

Inclusion criteria:

1. Patients aged between 20-50yrs
2. Patients of either sex
3. Patients with ASA grade I & II
4. Patients scheduled for elective surgical procedure under general anaesthesia.

Exclusion criteria:

1. Unwilling patients,
2. Emergency surgeries,
3. Anticipated difficult intubation,
4. Patients SBP >140 mm of Hg and DBP <90mm of Hg,
5. Patients with ASA grading of 3 and 4.

Pre-Anaesthetic Evaluation:

On the day prior to surgery pre anaesthetic evaluation was done and detailed history of cardiovascular system, respiratory system, central nervous system, drug therapy and drug allergy was taken. A thorough clinical examination of the patient was performed including General Physical Examination & systemic examination. Airway assessment was done by Mallampati grading to anticipate the possibility of difficult intubation.

All patients were explained about the anaesthetic technique & **written informed consent taken**. Patients were kept NPO for 8hrs prior to surgery.

Routine investigation done. {Hb %, BT, CT, Blood grouping, Urine analysis, ECG, BUN, Serum creatinine, & Fasting blood sugar}. No specific investigations were required pertaining to the study.

Pre - Medication:

All patients were given tablet Diazepam 5mg orally at bed time on the previous night of surgery.

Technique of anaesthesia/Procedure:

90 patients aged between 20 to 50 yrs. belonging to ASA grade I & II were randomly divided into 3 groups in a double blind manner, each group consists of 30 patients

1. **Group Ns-** Received Plain Normal Saline
2. **Group D-** Received 1mcg/Kg Of IV Dexmedetomidine 10 Min Before Laryngoscopy And Intubation
3. **Group C-**received 0.5mcg/kg of Clonidine 10 min before laryngoscopy and intubation

On the day of surgery, Anaesthesia machine and circuits were checked, resuscitation equipments were kept ready. After confirmation of NPO status patients were shifted to the operating room & connected to multichannel monitor Basal systolic blood pressure (SBP), diastolic blood pressure (DBP), Mean arterial pressure (MAP), heart rate and SpO2 (T0) were recorded after 5 min of settling in the OR. Rhythm monitoring from a continuous visual display of ECG along with continuous monitoring of the vital parameters were done.

An Intravenous line was secured with 18G cannula & preloading with 500ml of Ringer lactate done over 30 min for all patients. Following this, Group NS [Saline group] patients received 100ml normal saline infused over 10 mins. Group D [Dexmedetomidine group] patients received Intravenous Dexmedetomidine 1µg per kg in 100ml normal saline infused over 10 mins. Group C [Clonidine group] patients received Intravenous Clonidine 0.5 µg per kg in 100ml normal saline infused over 10 mins. Prior to induction, InjGlycopyrrolate 0.2mg, Inj Ondansetron 4mg, & Inj. Ranitidine 50mg were administered IV.

All patients were pre- Oxygenated for 3 mins&Anaesthesia induced with 5mg/kg Thiopentone sodium (2.5%).After successful trial ventilation with 100% oxygen, Succinyl choline 2 mg / kg given to facilitate laryngoscopy & intubation. Oxygenation continued by positive pressure mask ventilation using Dragger anaesthesia work station. Maintained with 50% O2 and 50% N2O.

After conforming relaxation, using laryngoscope with a Macintosh blade intubation was done with well lubricated, appropriate sized cuffed, disposable oralendotracheal tube by an experienced anaesthesiologist.

After confirmation of the tube position by bilateral auscultation for air entry, cuff inflated, and tube fixed, connected to anaesthesia work station. Anaesthesia maintained with N2O, O2, Isoflurane, controlled ventilation with appropriate fresh gas flow. SBP, DBP, MAP, Heart rate, SpO2 were recorded at 1 (T1), 3 (T2), 5 (T3) after laryngoscopy & intubation.

Sequence	SB,DBP,MAP,Heart rate,SpO2Recording
Basal reading when the patient is shifted to OT	T0
At 1 min after intubation	T1
At 3min after intubation	T2
At 5min after intubation	T3

Surgery commenced at the end of 5 min after laryngoscopy & intubation. No form of stimulus was applied during this period. Anaesthesia continued with N2O, O2, Isoflurane, Vecuronium loading dose given & top up doses, analgesics & IV fluids administered based on the requirements.

At the end of surgery, Isoflurane and N2O were discontinued and when respiratory attempts were present, residual neuromuscular blockade was reversed with InjNeostigmine (0.05mg/kg) & Glycopyrrolate (0.01mg/kg). Recovery assessed & extubation done after thorough throat suction. After adequate clinical recovery patients shifted to post anaesthesia care unit, observed for 2 hrs. for Nausea vomiting, Bradycardia, Hypotension, & Sedation. Post-operative follow up for 24hrs was done; side effects if any were treated & recorded.

III. Observations & Results

Statistical analysis:

Descriptive data is presented as Mean ±SD and in percentage. Multiple group comparisons were made by one way ANOVA followed by unpaired t test for pair wise comparison for all the tests a p value of <0.05 was considered for statistical significance.

Table 1- Age Distribution

Case summaries					
GROUP	N=no of patients	MEAN	STANARD DEVIATION	MINIMUM Age in years	MAXIMUM Age in years
Normal saline	30	32.1	8.8	20	50
Dexmedetomidine	30	35.8	9.6	20	50
Clonidine	30	33.4	9.2	20	50

The above table shows age distribution in control study groups. The mean values of age with standard deviations are 32.1 ± 8.8 , 35.8 ± 9.6 , and 33.4 ± 9.2 for normal saline, Dexmedetomidine and Clonidine groups respectively. There is no statistically significant difference between three groups. ($P=0.28$)

Graph 1: Age Distribution

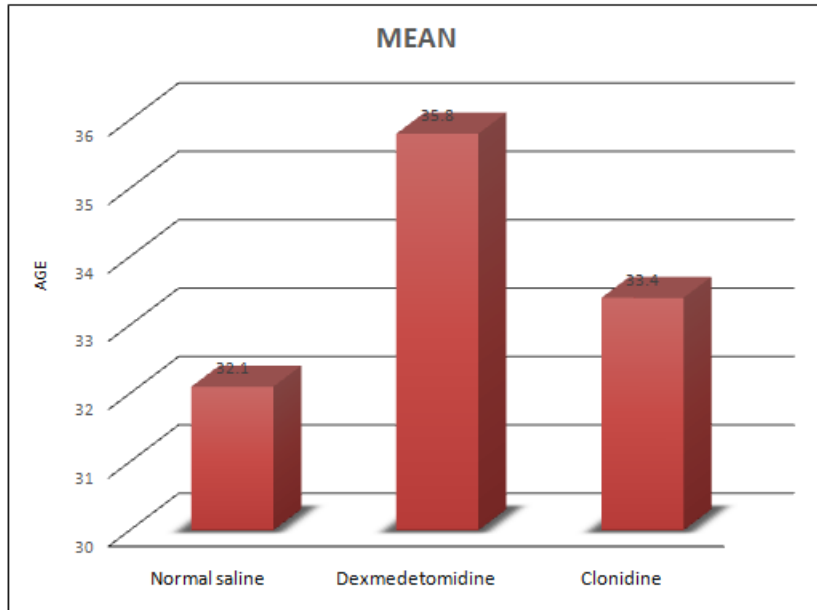


Table -2Sex Distribution

Sex	Normal saline	Dexmedetomidine	Clonidine
Male	14	17	14
Female	16	13	16

- In normal saline group 46% were males and 54% were females.
- Dexmedetomidine group had 56% males and 44% were females.
- Clonidine group contained 46% of male and 54% of female patients.
- There is no statistically significant difference was observed in sex wise distribution of the cases between three groups($p>0.005$).

Graph 2:Sex Distribution

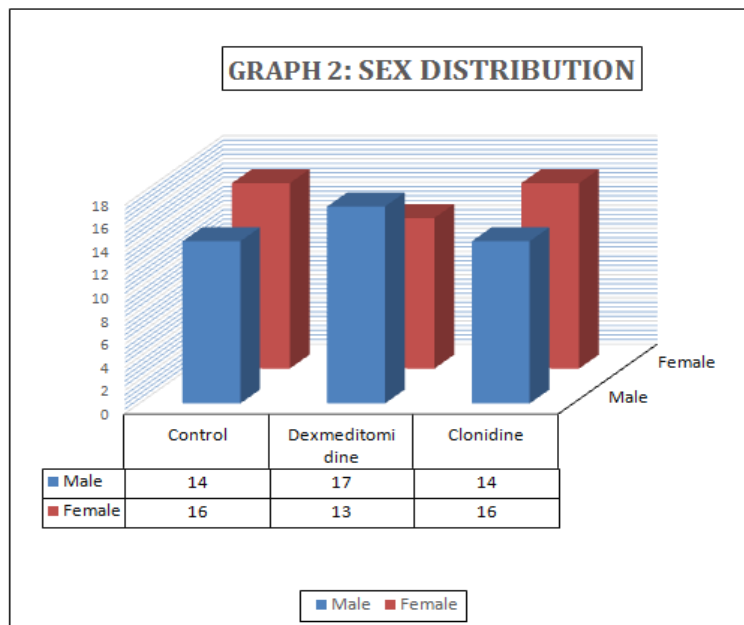
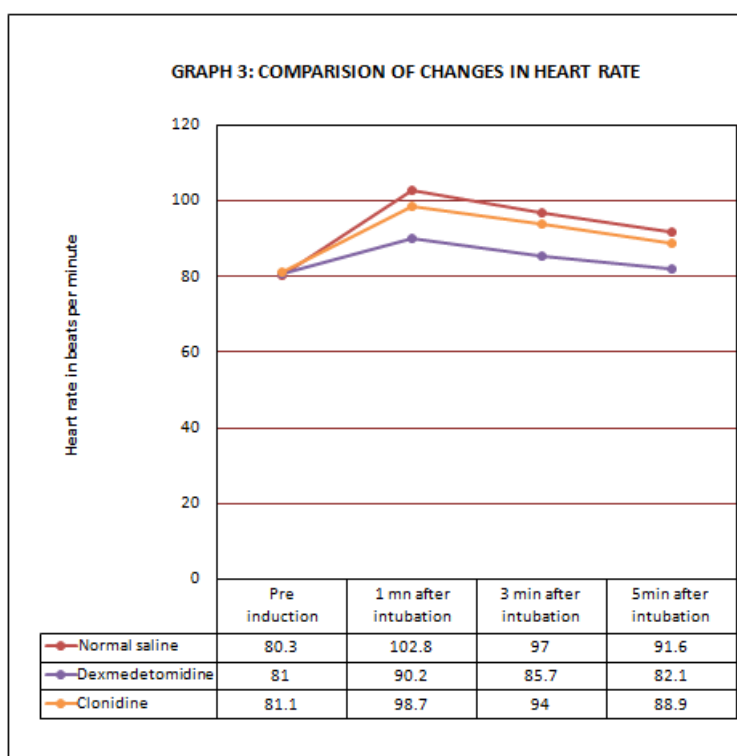


Table 3: Comparison of Changes in Heart Rate

TIME OF ASSESSMENT	CONTROL(NS)		DEXMEDITO MIDINE(D)		CLONIDINE (C)		ANOVA "F"&*P VALUES	Difference between groups**		
	Mean±S.D	%diff	Mean±S.D	%diff	Mean±S.D	%diff		1-2	1-3	2-3
Preinduction	80.3±17.9	-	81 ±20.3	-	81.1±13.1	-	0.94 >0.05	>0.05	>0.05	>0.05
1 min after intubation	102.8±19.6	28	90.2±18.4	11.3	98.7±14.5	21.7	3.34 <0.01	<0.01	>0.05	<0.05
3 min after intubation	97±12.2	20.8	85.7±16.2	5.8	94±12.8	15.9	5.27 <0.01	<0.01	>0.05	<0.05
5 min after intubation	91.6±11.7	14	82.1±15.4	1.3	88.9±14.1	9.6	3.81 <0.01	<0.01	>0.05	<0.05

-ve sign indicate decrease,*
P<0.05, P<0.01 are significant,
P<0.001 is highly significant,
P>0.05 is not significant (NS).



Changes in heart rate assessed at preinduction and at different time intervals from the onset of laryngoscopy and intubation in control & study groups and their comparative statistics are presented in the table. There is no statistically significant difference between the pre induction heart rate between three groups.

Normal saline group:

The mean heart rate in this group before induction of anaesthesia was 80.3±17.9. At one minute from the onset of laryngoscopy and intubation heart rate increased by 28% with mean of 102.8±19.6 and remained at same significantly higher level with 20.8% rise with mean heart rate of 97±12.2 at the end of 3 minutes. A decreasing trend noticed from 5 minutes with mean heart rate of 91.6±11.7 which is 14% higher than preinduction value.

Dexmedetomidine group:

This study group shows the mean heart rate of 81 ±20.3 before induction of anaesthesia. An increase of 11.3% in heart rate was observed at 1 minute from onset of laryngoscopy and intubation, having a mean value ± standard deviation 90.2±18.4. At 3 minutes it decreased to 5.8% (85.7±16.2), Increase was only 1.3% (82.1±15.4) of preinduction level at the end of 5 minutes.

Clonidine group:

The mean pre induction heart rate in this group of patient`s was 81.1±13.1 .there was 21.7% increase in heart rate (98.7±14.5) noticed at the end of 1 minute from the onset of laryngoscopy and intubation. An increase in heart rate was 15.9% (94±12.8) observed at 3 minutes. Increase at the end of 5 minutes was 9.6% (88.9±14.1) of pre induction level.

One way ANOVA study showed significant variations in heart rate before and after induction and at the intervals if 1, 3,5 minutes from the onset of laryngoscopy and intubation(P<0.01).

The difference in heart rate between normal saline and Dexmedetomidine group remain statistically significant at all times of assessment (P<0.01).

There is no significant difference between normal saline and Clonidine groups (P>0.05).

There is a significant difference between Dexmedetomidine and Clonidine groups (P<0.05).

The maximum increase in heart rate is 28% in normal saline and 21.7%in Clonidine group. Attenuation of heart rate by Clonidine when compared with control group is not significant (P>0.05).

Increase in heart rate remain clinically significant till the end of 5 minutes in normal saline and in Clonidine groups. There is no statistically significant difference between the pre induction heart rate between three groups.

Table 4: Comparison of Changes in Systolic BloodPressure

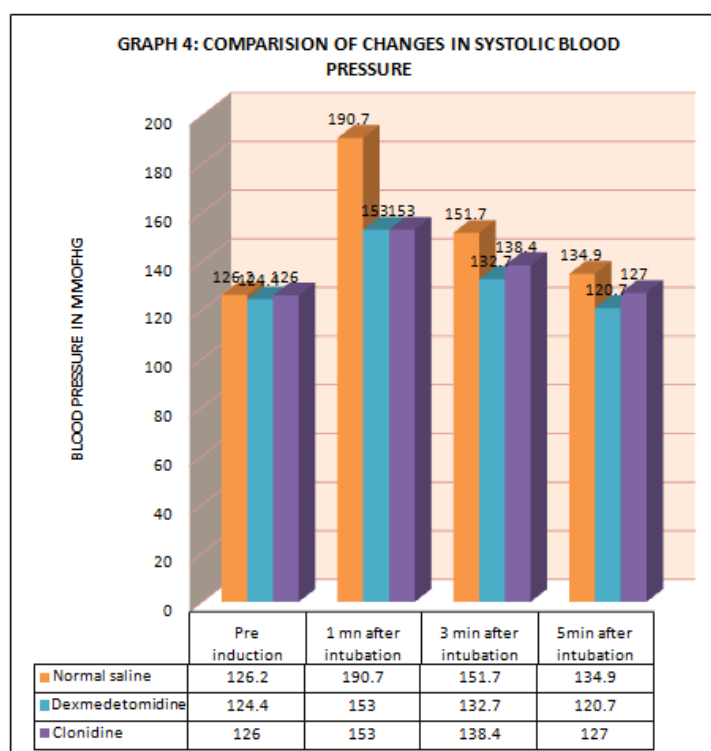
Time Of Assessment	Control(Ns)		Dexmedito Midine(D)		Clonidine (C)		Anova "F"&*P Values	Difference Between Groups**		
	Mean +S.D	%Dif f	Mean +S.D	%Diff	Mean +S.D	%Diff		1-2	1-3	2-3
Pre Induction	126.2±11	-	124.4±24.3	-	126±11.7	-	0.1 >0.05	>0.05	>0.05	>0.05
1min After Intubation	190.7±30.4	51.1	153±21	22.9	153±29.3	21.4	3.7 <0.05	<0.05	<0.05	>0.05
3min After Intubation	151.7±19.2	20.2	132.7±32.5	6.7	138.4±14.2	9.8	5.24 <0.01	<0.01	<0.01	>0.05
5min After Intubation	134.9±14.7	6.8	120.7±15.1	-2.9	127±13	0.007	7.37 <0.005	<0.01	<0.05	>0.05

-ve sign indicate decrease than basal value,

P<0.05, P<0.01 are significant,

P<0.001 is highly significant,

P>0.05 is not significant (NS).



The Changes in systolic blood pressure assessed at preinduction and at different time intervals from the onset of laryngoscopy and intubation in control & study groups and their comparative statistics are presented in the table.

There was no statistically significant difference between the preinduction systolic blood pressures between three groups.

Normal saline group:

The mean systolic blood pressure in this group before induction of anaesthesia was 126.2±11. At one minute from the onset of laryngoscopy and intubation systolic blood pressure increased by 51.1% with mean systolic blood pressure of 190.7±30.4 and remained at same significantly higher level above basal value with 20.2% (mean of 151.7±19.2) at the end of 3 minutes. At 5 minutes mean systolic blood pressure was 134.9±14.7 which is 6.8% higher than preinduction value.

Dexmedetomidine group:

This study group shows the mean systolic blood pressure of 124.4±24.3 before induction of anaesthesia. An increase of 22.9% in systolic blood pressure was observed at 1 minute from onset of laryngoscopy and intubation, having a mean value ± standard deviation 153±21. At 3 minutes increase was only 6.7% (132.7±32.5) It was further decreased to -2.9% (120.7±15.1) of preinduction level at the end of 5 minutes.

Clonidine group:

The mean systolic blood pressure before pre induction in this group of patients was 126±11.7. There was 21.4% increase in systolic blood pressure (153±29.3) noticed at the end of 1 minute from the onset of laryngoscopy and intubation. The increase was only 9.8% (138.4±14.2) observed at 3 minutes. It was 0.007% (127±13) at the end of 5 minutes compared to pre induction level.

One way ANOVA study shows a statistically significant difference among all the groups at subsequent assessments (P<0.001 and P<0.01).

Attenuation of rise in systolic blood pressure is significant in Dexmedetomidine group with in 1 minute with P<0.05 and in 3 & 5 minutes with P<0.01 in comparison to control group.

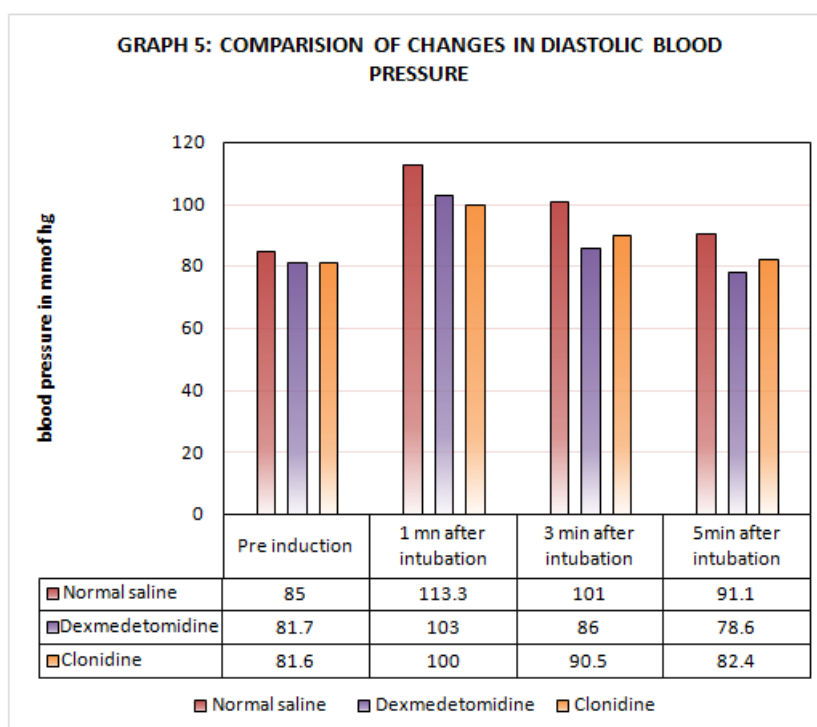
Also with Clonidine group statistically significant attenuation in comparison with control group seen in 1 minute P<0.05, in 3 minutes P<0.01 and in 5 minutes p<0.05. It returned to base line in both Dexmedetomidine and Clonidine groups in 5 minutes than normal saline group.

But there is no statistically significant difference between Dexmedetomidine and Clonidine groups (P>0.05).

Table 5: Comparison of Changes in Diastolic Blood Pressure

Time Of Assessment	Control(Ns)		Dexmedit Midine(D)		Clonidine (C)		Anova "F"&*P Values	Difference Between Groups**		
	Mean +S.D	%Diff	Mean +S.D	%Diff	Mean +S.D	%Diff		1-2	1-3	2-3
Pre Induction	85±10.3	-	81.7±9	-	81.6±8.9	-	1.19 >0.05	>0.05	>0.05	>0.05
1 Min After Intubation	113.3±19	33.6	103±24.5	26	100±17.5	22.5	3.5 <0.05	<0.05	<0.01	>0.05
3 Min After Intubation	101±18.2	18.8	86±15.1	5.2	90.5±11.7	10.9	7.4 <0.001	<0.001	<0.01	>0.05
5 Min after Intubation	91.1±13.2	7.1	78.6±13.1	-3.7	82.4±9.2	0.9	8.4 <0.001	<0.001	<0.01	>0.05

-ve sign indicate decrease,
P<0.05, P<0.01 are significant,
P<0.001 is highly significant,
P>0.05 is not significant (NS).



The Changes in Diastolic blood pressure assessed at preinduction and at different time intervals from the onset of laryngoscopy and intubation in control study groups and their comparative statistics are presented in the table. There was no statistically significant difference between the pre induction diastolic blood pressures between three groups

Normal saline group:

The mean Diastolic blood pressure in this group before induction of anaesthesia was 85 ± 8.9 . At one minute from the onset of laryngoscopy and intubation Diastolic blood pressure increased by 22.5% with mean diastolic blood pressure of 100 ± 17.5 and increase was only 18.8% rise with mean of 101 ± 18.2 at the end of 3 minutes. At 5 minutes mean systolic blood pressure (91.1 ± 13.2) which was 7.1% higher than preinduction value.

Dexmedetomidine group:

This study group shows the mean Diastolic blood pressure of 81.7 ± 9 before induction of Anaesthesia. An increase of 26% in Diastolic blood pressure was observed at 1 minute from onset of laryngoscopy and intubation, having a mean value \pm standard deviation 103 ± 24.5 . At 3 minutes it was only 5.2% (86 ± 15.1) compared to pre induction value, It was further decreased to -3.7% (78.6 ± 13.1) of preinduction level observed at the end of 5 minutes.

Clonidine group:

The mean Diastolic blood pressure before pre induction in this group of patients was 81.6 ± 8.9 . There was 22.5% increase in diastolic blood pressure (100 ± 17.5) at the end of 1 minute from the onset of laryngoscopy and intubation. It was 10.99% (90.5 ± 11.7) at 3 minutes and it was 0.9% (82.4 ± 9.2) at the end of 5 minutes compared to pre induction level.

One way ANOVA test shows a statistically significant difference among all the groups ($P < 0.05$ and $P < 0.001$).

Attenuation of rise in diastolic blood pressure is significant in Dexmedetomidine group compared to normal saline group at 1 minute with P value of < 0.05 and at 3 & 5 minutes $P < 0.001$.

Also with Clonidine group significant attenuation compared to control group seen at 1 minute $P < 0.05$ and at 3 & 5 minutes $P < 0.01$.

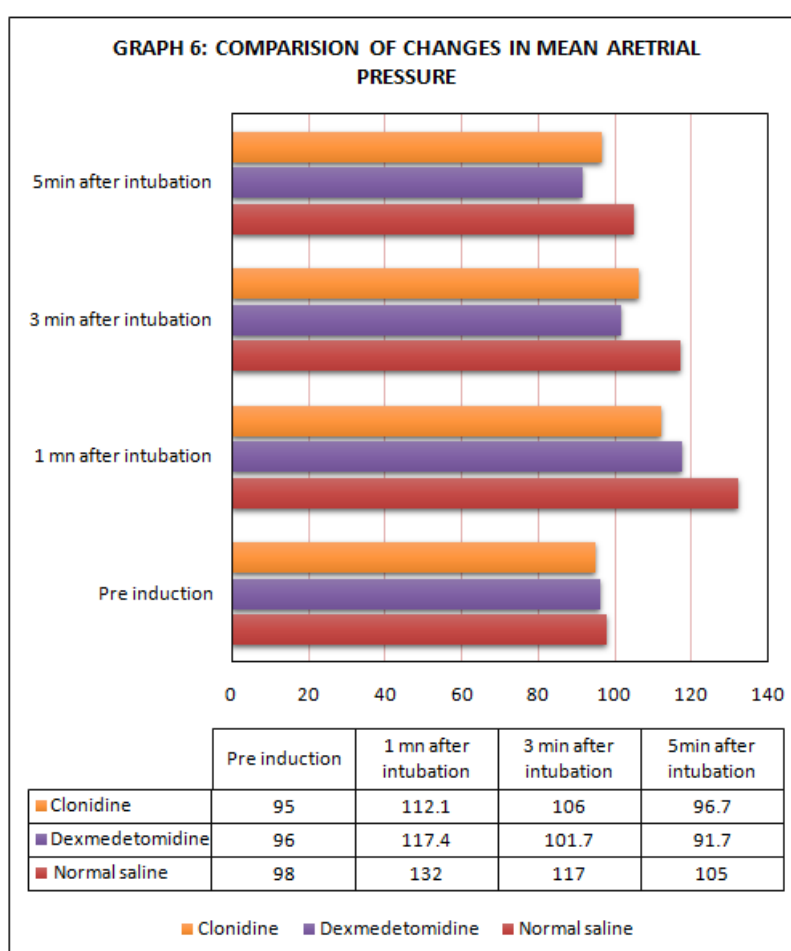
It returned to base line in both Dexmedetomidine and Clonidine groups at 5 minutes compared to normal saline group.

But there is no statistically significant difference between Dexmedetomidine and Clonidine groups ($P > 0.05$).

Table 6: Comparison of Changes in Mean Arterial Blood Pressure

Time Of Assessment	Control(Ns)		Dexmedito Midine(D)		Clonidine (C)		Anova "F" & *P Values	Difference Between Groups**		
	Mean ±S.D	%Diff	Mean ±S.D	%Diff	Mean ±S.D	%Diff		1-2	1-3	2-3
Pre Induction	98±9.5	-	96±9.5	-	95±9.8	-	0.7 >0.05	>0.05	>0.05	>0.05
1 Min After Intubation	132±21	34.6	117.4±22	22.3	112.1±26.5	18	5.9 <0.005	<0.01	<0.01	>0.05
3 Min After Intubation	117±18.5	19.4	101.7±16.3	5.9	106±11.8	11.5	7.4 <0.005	<0.01	<0.05	>0.05
5 Min After Intubation	105.2±12.3	7.1	91.7±14.1	-4.5	96.7±9.3	7.1	9.5 <0.005	<0.01	<0.01	>0.05

-ve sign indicate decrease,*
P<0.05, P<0.01 are significant,
P<0.001 is highly significant,
P>0.05 is not significant (NS).



The Changes in mean arterial pressure assessed at preinduction and at different time intervals from the onset of laryngoscopy and intubation in control study and study groups and their comparative statistics are presented in the table. There was no statistically significant difference between the pre induction mean arterial pressures between three groups

Normal saline group:

The mean mean arterial pressure in this group before induction of anaesthesia was 98±9.5. At one minute from the onset of laryngoscopy and intubation mean arterial pressure increased by 34.6% with value of 132±21, 19.4% rise with value of 117±18.5 at 3 minutes, and at 5 minutes 7.1% rise with value of 105.2±12.3 which is above preinduction value.

Dexmedetomidine group:

This study group shows the mean mean arterial blood pressure of 81.7 ± 9 before induction of anaesthesia. An increase of 22.3% in mean arterial pressure was observed at 1 minute from onset of laryngoscopy and intubation, having a mean value \pm standard deviation 117.4 ± 22 . At 3 minutes it was 5.9% (101.7 ± 16.3) compared to pre induction value, it was decreased to -4.5% (91.7 ± 14.1) of preinduction level at the end of 5 minutes.

Clonidine group:

The mean mean arterial pressure before pre induction in this group of patients was 95 ± 9.8 . There was 18% increase in mean blood pressure (112.1 ± 26.5) at the end of 1 minute from the onset of laryngoscopy and intubation. It was 11.5% (106 ± 11.8) at 3 minutes. It was 7.1% (96.7 ± 9.3) at the end of 5 minutes compared to pre induction level.

One way ANOVA test shows a statistically significant difference among all the groups at subsequent assessments ($P < 0.01$).

Attenuation of rise in mean arterial pressure is significant in Dexmedetomidine group and Clonidine group compared to normal saline group at all times with $P < 0.01$. MAP returned to base line in both Dexmedetomidine and Clonidine groups at 5 minutes compared to normal saline group.

But there is no statistically significant difference between Dexmedetomidine and Clonidine groups. ($P > 0.05$).

IV. Discussion

Demographic criteria

Three groups were comparable and there was no statistically significant difference between the mean ages and sex. In this study optimal age range was 20 to 50 years.

The mean values of age with standard deviations are 32.1 ± 8.8 , 35.8 ± 9.6 , and 33.4 ± 9.2 for normal saline, Dexmedetomidine and Clonidine groups respectively. There are no significant difference between three groups. ($P = 0.28$)

In normal saline group 46% were males and 54% were females. Dexmedetomidine group had 56% males and 44% were females. Clonidine group contained 46% of male and 54% of female patients. No significant difference was observed in sex wise distribution of the cases between three groups ($p > 0.005$).

Heart rate changes:-

The basal mean HR in the present study in Group NS, Group D and Group C were 80.3 bpm, 81 and 81.1 bpm respectively.

At 1 min after intubation in Group NS there was 28% increase in mean HR compared to basal, whereas in Group D there was only 11.3% increase in mean HR compared to basal value this was statistically significant compared to group NS ($P < 0.01$).

whereas in Group C there was 21.7% increase in mean HR compared to basal value which was not statistically significant compared to group NS ($P > 0.05$) but statistically significant compared to Group D ($P < 0.05$).

3 minutes after intubation in Group NS there was 20.8% increase in mean HR compared to basal, whereas in Group D there was only 5.8% increase in mean HR compared to basal value which was statistically significant compared to group 1 ($P < 0.01$).

whereas in Group C there was 15.9% increase in mean HR compared to basal value which was not statistically significant compared to group NS ($P > 0.05$) but statistically significant compared to Group D ($P < 0.05$).

5 minutes after intubation in Group NS there was 14% increase in mean HR compared to basal value which is significant, whereas in Group D there was 1.3% increase in mean HR compared to basal value. This was statistically significant compared to group NS ($P < 0.01$).

whereas in Group C there was 9.6% increase in mean HR compared to basal value which was not statistically significant compared to group NS ($P > 0.05$), not statistically significant from Group D ($P > 0.05$).

Systolic blood pressure changes:-

The basal mean SBP in the present study in Group NS, Group D and Group C were 126.2, 124.4, 124 mm of Hg respectively. 1 min after intubation in Group NS there was 51.1% increase in mean SBP compared to basal, whereas in Group D there was 22.9% increase in mean SBP compared to basal value which was statistically significant compared to group NS ($P < 0.05$). whereas in Group C there was 21.4% increase in mean SBP compared to basal value which was statistically significant compared to group NS ($P < 0.05$) but not statistically significant from Group D ($P > 0.05$).

3minutes after intubation in Group NS there was 20.2% increase in mean SBP above basal value, whereas in Group D there was 6.7% increase in mean SBP above basal value which was statistically significant compared to group NS($P<0.01$).whereas in Group C there was 9.8%increase in mean SBP compared to basal value, this was statistically significant compared to group NS ($P<0.01$) not statistically significant from Group D ($P>0.05$). 5minutes after intubation in Group NS there was 6.8% increase in mean SBP compared to basal, whereas in Group D there was 2.9% increase in mean SBP compared to basal value which was statistically significant compared to group NS($P<0.01$).whereas in Group C there was 0.007%increase in mean SBP compared to basal value which was statistically significant compared to group NS ($P<0.05$) but not statistically significant from Group D ($P>0.05$).

Diastolic blood pressure changes:-

The basal mean DBP in the present study in Group NS, Group D and Group C were 113.3, 103, 100 mmofHg respectively. 1 min after intubation in Group NS there was 33.6% increase in mean DBP compared to basal, whereas in Group D there was 26% increase in mean DBP compared to basal value which was statistically significant compared to group NS ($P<0.05$).whereas in Group C there was 7.1%increase in mean DBP compared to basal value which was statistically significant compared to group NS ($P<0.001$) but statistically not significant from Group D ($P>0.05$).

3minutes after intubation in Group NS there was 18.8% increase in mean DBP compared to basal, whereas in Group D there was 5.2% increase in mean DBP compared to basal value which was statistically significant compared to group NS($P<0.001$).whereas in Group C there was 10.9%increase in mean DBP compared to basal value which was statistically significant compared to group NS ($P<0.01$) but not statistically significant from Group D ($P>0.05$).

5minutes after intubation in Group NS there was 7.1% increase in mean DBP compared to basal, whereas in Group D there was 3.7% decrease in mean DBP compared to basal value which was statistically significant compared to group NS($P<0.001$).whereas in Group C there was 0.9%increase in mean DBP compared to basal value which was statistically significant compared to group NS ($P<0.01$) but not statistically significant from Group D ($P>0.05$).

Mean arterial blood pressure changes:-

The basal mean MAP in the present study in Group NS, Group D and Group C were 98, 96, 95 mmofHg respectively. 1 min after intubation in Group NS there was 34.6% increase in mean MAP compared to basal, whereas in Group D there was 22.3% increase in mean MAP compared to basal value which was statistically significant compared to group NS ($P<0.01$).whereas in Group C there was 18%increase in mean MAP compared to basal value which was statistically significant compared to group NS ($P<0.01$) but statistically not significant from Group D ($P>0.05$).

3minutes after intubation in Group NS there was 19.4% increase in mean MAP compared to basal, whereas in Group D there was 5.9% increase in mean MAP compared to basal value. This was statistically significant compared to group NS ($P<0.01$).whereas in Group C there was 11.5% increase in mean MAP compared to basal value which was statistically significant compared to group NS ($P<0.05$) but not statistically significant from Group D ($P>0.05$).

5minutes after intubation in Group NS there was 7.1% increase in mean MAP compared to basal, whereas in Group D there was 4.5% increase in mean MAP compared to basal value which was statistically significant compared to group NS ($P<0.01$), in Group C there was 7.1%increase in mean MAP compared to basal value which was statistically significant compared to group NS ($P<0.01$) but not statistically significant from Group D ($P>0.05$).

Side Effects:

In the present study in Dexmedetomidine Group 2 patients had bradycardia intraoperatively which was statistically insignificant. It was immediately corrected with atropine 0.6 mg. In the Clonidine group one patient developed hypotension. It was also statistically insignificant it responded with 500ml of IV ringers lactate administration within 10 minutes. Post operatively in all three groups none of them developed the complications like bradycardia and hypotension.

V. Conclusion

Based on the present clinical comparative study the following conclusion can be made.

In patients with no drugs to attenuate the sympathetic response to laryngoscopy and intubation the maximum rise of heart rate ,systolic, diastolic, mean arterial blood pressures are 28%,51.1%, 33.6%,34.6% respectively when compared with preinduction values.

➤ Dexmedetomidine significantly attenuates the sympathetic response to laryngoscopy and intubation.

- Clonidine also significantly attenuates the sympathetic response.
- Dexmedetomidine is more effective than Clonidine in attenuation in heart rate response to laryngoscopy and intubation.
- There is no statistically significant difference in attenuation of systolic blood pressure, diastolic blood pressure, and mean arterial blood pressure change during laryngoscopy and intubation between Dexmedetomidine and Clonidine groups, though clinical variability is observed.
- IV bolus dose of Dexmedetomidine 1 mcg/kg administered 10 minutes before laryngoscopy and intubation can be recommended to attenuate the sympathetic response to laryngoscopy and intubation without any side effects.

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