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Comparative Study of Propofol and Propofol with Dexmedetomidine for Attenuation of Pressor Response During Laryngoscopy And Intubation

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I. Introduction

General Anaesthesia with Endotracheal intubation with the help of muscle relaxant has most popular procedure in the practice of Anaesthesia. The process of laryngoscope and endotracheal intubation is associated with intense sympathetic activity marked by tachycardia and hypertension.

Normal healthy person tolerate this response, but it is undesirable in patients with systemic hypertension, coronary artery disease and intra cranial aneurysm and may result in deleterious effects like ventricular failure, arrhythmias, myocardial infarction, cerebral haemarrage and rupture of cerebral aneurysm, hence the search for an Ideal agent to attenuate the haemodynamic response. For this Alpha – 2 agonists is used. They are Clonidine and Dexmedetomidine. Dexmedetomidine is highly specific & Selective a_2 adrenoceptor against the study was under taken to evaluate the effect of alpha-2 agonist. Dexmedetomidine as premedicationin attenuating presser response during laryngoscope & Endotracheal intubation.

AIM AND OBJECTIVESAIMS
This randomized prospective study was done to evaluate the efficacy of single premedication dose. I.V Dexmedetomidine in attenuating presser response to laryngoscope and endo tracheal intubation.

OBJECTIVE
To evaluate the efficacy of single premedication dose of intra venous Dexmedetomidine 1 µg/KG Bodyweight in: -
1- Attenuating the pressure response to laryngoscopy and endotracheal intubation.2- Post-anaesthesia recovery characteristics.
3. Side effects if any.

II. Review Of Literature

In 2008, Basar H et al , conducted a randomized prospective double blind controlled study to investigate the haemodynamic, cardiovascular and recovery effects of dexmedetomedine used as single preanaesthetic dose. Patients were randomly divided into two groups to receive 0.5 µg/KG body dexmedetomidine or saline solution in a 10 ml solution by slow I.V push over 60s.

It was conclude that a single dose 0.5 µg/KG body wt. of dexmedetomidine given preoperatively 10 min before induction caused significant sedation, decreased thiopental does and blunted haemodynamic response to intubation with no change in recovery scores.

III. Material And MethodsDesign

This study was carried out at Nalanda Medical College & Hospital, Patna between November 2015 to June 2017. Sixty patients in the age group 20-60yrs of either sex, ASA grade I and Scheduled for elective surgical procedures under general anaesthesia were included after registering with clinical trials registry India.
MATERIALS
Dexmedetomidine (Dexmed- 50 µg/ml of 2ml ampoules)Normal Saline – 100ml
Propofol 1% (100mg per 10ml)

INCLUSION CRITERIA-

1. Patients aged between 20-60yrs.2- patients of both sex
3- patients with ASA grade I
4. patients scheduled for elective operation under General anaesthesia.

EXCLUSION CRITERIA

1. patients with difficult airways
2. patients with hiatus hernia3- Patients with GERD
4. Patients with BMI>30
5- Patients with on antihypertension drugs
6. patients on sedatives, hypnotics& antidepressants
7. H/O cardiovascular, respiratory, hepatic & renal diseases.8- Endocrinal diseases.
9. Malnourished

PRE- ANAESTHETIC MEDICATION

All patients were given tablet diazepam 5mg orally at bed time on the previous night of surgery.TECHNIQUE OF ANAESTHESIA/PROCEDURERS

The patients were selected in two groups.

Group- I- patients were received 100ml of normal saline. It was infused over 15 minutes.

Group – II- Patients were received intravenous Dexmedetomindine 1 µg/kg body wt. in 100ml normal over 15 minutes.

After 5 mint. Of stabilizing period SBP, DBP, MAP, Heart Rate, SPO_2 was recorded.

Prior to induction inj. Glycopyrrolate 0.2 mg, Inj. ondansetron 4mg & inj. Ranitidine 150mg wereAdministered I.V.

All patients were Pre-Oxygenated for 3 minutes and anaesthesia induced with propofol 2mg/kg body wt. vecuronium 0.1mg/kg body wt. to facilitated laryngoscopy & intubation, 100% oxygen continued by positive pressure mask ventilation using closed circuit.

Anaesthesia maintained with 50% O_2 & 50% N_2O at 2 minutes after Induction SBP, DBP, MAP, HR & SPO_2 Was recorded (T2). At 3 minutes after induction using laryngoscope with Macintosh blade oral intubation was done. This was accomplished within 20 sees.

The E. Tube was fixed after confirmation of E. Tube position for bilateral air entry. The E. tube fixed and connected to Boyle's machine with closed circuit. Anaesthesia maintained with 50% O_2 +50% N_2O and 1% Isoflurane. The fresh gas flow was 1.5 lit/m O_2 & 1.5lit/m N_2O.

The SBP, DBP, MAP, HR & SPO_2 were recorded at 1min after intubation (T3), then 3mins (T4), 5mins (T5) and 10 min. after intubation (T6).

Surgery started at the end of 10 mins after laryngoscopy & intubation. No form of Stimulus was applied during this period. After adequate clinical recovery patients shifted to PACU, Observed for 2 min. for Nausea & Vomiting, Barady Cardia, Hypotension and sedation. After assessing the Stewart awakening Score (Steward Score >12) patients shifted to the ward. Post-operative follows up for 24 hrs. was done. Side effects if any were treated & recorded.

MONITORING-

Brady cardia- Defined as HR<60 beats/min Tachycardia- defined as HR> 100 beats/Min

Hypertension – Defined as SBP> 30% of base line valueHypotension- Defined as SBP<30% of base line value.

Arrhythmias – any rhythm other than sinus.

STEWARD AWAKENING SCORE-

1. Level of consciousness
   a. Awake oriented- 2
   b. Arousable with minimal stimuli – 1
   c. Responsive only to tactile Stimuli – 0
2. Physical activity
   a. able to move all extremities on command - 2
   b. Weakness in movement – 1
   c. Unable to move voluntarily – 0
3. Haemodynamic Stability
   a. Blood pressure <15% of increase in baseline mean arterial Pressure - 2
   b. Blood pressure 15-30% of increase in baseline mean arterial Pressure -1
   c. Blood Pressure >30% of increase in baseline mean arterial Pressure 0

4. Reparatory stability
a. Able to breathe deeply - 2
b. Tachypynoea with good cough – 1
c. Dyspnoea with weak cough – 0

5. Oxygen Saturation
a. > 90% on room air – 2
b. > 90% on Oxygen Supplementation – 1
c. < 90% on Oxygen Supplementation – 0
6. Post- operative Pain
a. None or mild - 2
b. Moderate to severe pain controlled with intravenous analgesics – 1
c. persistent pain – 0
7. Post- Operative Emetic Symptoms
a. None or mild nausea with vomiting - 2
b. Transient Vomiting - 1
c. Moderate to severe Vomiting – 0

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a. Excellent recovery – 12-14 Scores
b. Satisfactory Recovery -9- 12 Scores
c. < 9 as poor recoveries from general anaesthesia

As per steward awakening score, recording were done once in 15 min. for one hour.

IV. Observations And Results

Table-1

Showing the inter group comparison of mean heart rate (BPM) changes in response to laryngoscopyand intubation between group I and group IIs.

Time	Group I	Group II	P- Value	Remarks
To (basal)	89.1± 11.40	88.1 ± 11.32	0.73	NS
T1 Pre-induction	87.3 ± 11.11	71 ± 10.98	0.000	HS
T 2 Induction	87.1 ± 10.78	70.9 ± 10.88	0.000	HS
T3 (1 min.)	101.3 ± 11.56	80.13 ± 11.29	0.000	HS
T4 (3min)	99.5 ± 11.65	77.8 ± 10.63	0.000	HS
T5 (5min)	95.9 ± 11.04	75.7 ± 9.78	0.000	HS
T6 (10min)	92.4 ± 10.23	75.2 ± 10.40	0.000	HS

($p<0.01$)- Statistically highly significant, ($p<0.05$)- statistically significant, ($p>0.05$) – Statistically Not Significant (NS)

TABLE - 2

Showing inter group comparison of mean systemic blood pressure (in min of hg) changes in response to laryngoscopy & intubation between group I& group II

Time	Group I	Group II	P- Value	Remarks
To (basal)	121 ± 9.49	122 ± 9.83	0.60	NS
T1 Pre-induction	118.6± 8.48	113.2± 10.37	0.03	S
T 2 Induction	119.1± 8.47	112.2± 10.41	0.01	S
T3 (1 min.)	125.7 ± 7.90	113 ± 8.03	0.000	HS
T4 (3min)	122.4 ± 7.58	111.8 ± 8.19	0.000	HS
T5 (5min)	119.5 ± 6.99	111.1 ± 8.49	0.0001	HS
T6 (10min)	118.1 ± 7.19	110.7 ± 7.73	0.0003	HS

($p<0.01$) - Statistically highly significant, ($p<0.05$)- statistically significant, ($p>0.05$) – Statistically Not Significant (NS)

TABEL – 3

DBP

Time	Group I	Group II	P- Value	Remarks
To (basal)	77.4 ± 8.06	76.5 ± 10.35	0.71	NS
T1 Pre-induction	76.2 ± 8.11	68.43 ± 9.94	0.002	HS
T 2 Induction	76.3 ± 7.63	66.8 ± 9.14	0.000	HS
T3 (1 min.)	82.4 ± 5.88	69.3 ± 10.47	0.000	HS
T4 (3min)	78.3 ± 7.13	65.8 ± 8.11	0.000	HS
T5 (5min)	75.8 ± 7.19	64.2 ± 7.79	0.000	HS
T6 (10min)	75.6 ± 7.22	63 ± 8.30	0.000	HS

($p<0.01$) - Statistically highly significant, ($p<0.05$)- statistically significant, ($p>0.05$) – Statistically No Significant (NS)

TABLE – 4

MAP

Time	Group I	Group II	P- Value	Remarks
To (basal)	91.36 ± 8.08	91.46 ± 9.22	0.96	NS
T1 Pre-induction	89.96 ± 7.78	82.63 ± 9.68	0.002	HS
T 2 Induction	90.1 ± 7.46	81.43 ± 8.94	0.0001	HS
T3 (1 min.)	96.3 ± 6.19	83.33 ± 9.19	0.000	HS
T4 (3min)	92.4 ± 6.73	80.56 ± 7.61	0.000	HS
T5 (5min)	89.7 ± 6.45	79.43 ± 7.37	0.000	HS
T6 (10min)	89.2 ± 6.92	78.33 ± 7.63	0.000	HS

($p<0.01$) - Statistically highly significant, ($p<0.05$)- statistically significant, ($p>0.05$) – Statistically No Significant (NS)

V. Discussion

Various authors have used different doses of dexmedetomidine for attenuation of sympathetic response to intubation since most of the authors have found dexmedetomidine effective at the dose of 1µg/kg body wt. So, 1µg/kg body wt. dose was chosen in this study. The dose selected in my study is similar as in the studies conducted by Yildize et at 33, Kunisawa et at 35 & Sukhminder jit et at 31.

VI. Summary And ConclusionSummary

The study group was divided randomly into two groups of 30 patients each.
Group I- Patients were received 100 ml of normal saline infused over 15 min. before induction.
Group II- Patients were received IV dexmedetomidine 1mcg/kg in 100ml normal saline induced over 15 min. before induction.
All the patients were premeditated with Glycopyrrolate 0.2mg, Inj. Ondansetron 4 mg, Inj. Ranitidine 150mg given IV just before induction.

Anaesthesia was induced 15 min. after the study with Inj. Propofol (1%) 2mg/kg & vecuronium 0.1 mg/kg and I.P.P.V continued, Laryngoscopy & intubation was done after 3 min. The HR, SBP, DBP & MAP were recorded1 min, 3min, 5 min & 10 min. after intubation.
There was marked induced in HR, SBP, DBP & MAP throughout the study period following laryngoscopy & intubation. In Dexmedetomidine group HR, SBP, DBP & MAP showed significant decreased throughout the study period.
Hence, Dexmedetomidine given 15 min. before induction was effectively attenuate the pressure response during laryngoscopy & intubation.

CONCLUSION

Present study can be concluded that-
In Group I- Where no drug was administered to attenuate the pressure response. All the patients showed

significant rise of HR, SBP, DBP & MAP throughout in study period and maxm change seen at 1 min. after intubation.

In group II- Where the patients received Dexmedetomidine showed significant disease in HR, SBP, DBP,& MAP throughout the study period hence Dexmedetomidine in the dose of 1 mcg/kg body as I.V infusion, given 15min. before induction can be used safely to attenuate the pressure response to laryngoscopy & intubation without significant side effects.

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