Original Research Article

A comparison of dexmedetomidine (0.25mcg/kg) and clonidine(1mcg/kg) to attenuate stress response during laryngoscopy and intubation

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Abstract
Background: Direct Laryngoscopy And Intubation Are Very Powerful Stimuli Which Leads To Increased Sympathetic Stimulation Resulting In Tachycardia And Hypertension .This response May Be Fatal In High Risk Patients And Can Be Blunted By Appropriate Premedication .The Aim Of This Study Was To Compare Dexmedetomidine 0.25mcg/Kg And Clonidine 1mcg /Kg As A Premedication To Blunt The Haemodynamic Response During Laryngoscopy And Intubation. **Methods**:100 Adult Patients Of Asa I & II Between 20 To 60 Years Of Age Of Either Sex, Divided Into 2 Groups ,50 Patient In Each Group.Group 1- Received 1 Mcg/Kg Clonidine And Group-II Received 0.25mcg/Kg Of Dexmedetomidine. Haemodynamic Parameters Were Noted Before Induction ,After Induction After Laryngoscopy And Intubation And After 5 Min. Of Laryngoscopy And Intubation. **Result:** In Our Study Haemodynamic Parameters Indicating Sympathetic Responses Like Hr, Sbp,Dbp ,Map All Incresed During Laryngoscopy And Intubation. Premedication With Clonidine 1mcg/Kg and Dexmedetomidine 0.25mcg/Kg Reduced The Increased Haemodynamic Response But Attenuation Was More With 0.25 Mcg/Kg Dexmedetomidine Group As Compared To Clonidine 1mcg/Kg Group Which Was Significant (P<0.005). **Conclusion:** We Conclude That Intravenous Dexmedetomidine 0.25 Mcg/Kg Significantly Reduces The Haemodynamic Response During Laryngoscopy And Intubation As Compared To Intravenous Clonidine 1 Mcg./Kg
Keywords: Dexmedetomidine,Clonidine,Haemodynamic Response,Endotracheal Intubation.

Introduction

Laryngoscopy and tracheal intubation are well known noxious stimuli which evoke sympathetic response and manifests. As increase in heart rate and blood pressure.This sympathetic overstimulation is transient lasting upto 10 min may prove life threatening in vulnerable patient population like patients of heart disease, myocardial ishemia and pheochromocytoma.

Continuous efforts are being made to find appropriate solution to attenuate this untoward sympathetic response to laryngoscopy and intubation thus preventing complications perioperatively .Some of these methods to blunt sympathetic response are using lignocain sprays,calcium channel blockers,nitroglycerine and achieving deeper planes of anaesthesia. Alpha-2 adrenoreceptor agonists are now becoming important adjunctive anaesthetic agents because of there haemodynamic stablizing and anaesthesia sparing effects.For this purpose clonidine and dexmedetomidine are being used. Clonidine blunts stress response to surgical stimuli and reduces the narcotic and anaesthetic requirements. It stablizes blood pressure by increasing cardiac baroreceptor reflex sensitivity[4].However, its mild selectivity to alfa 2 adrenoceptors and long half-life has limited its use. dexmedetomidine is a newer imidazole derivatives which is highly selective alfa 2 adrenergic receptors agonist. Alfa 2 agonists produce hyperpolarization of noradrenergic neurons and suppression of neuronal firing in the locus ceruleus leading to decreased systemic noradrenaline release.

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This results in Decreased sympathoadrenal response and haemodynamic stability during laryngoscopy and tracheal intubation[17].

The present study was designed to evaluate and compare the effect of iv dexmedetomidine and clonidine in attenuating pressor response to laryngoscopy and endotracheal intubation

Method

This Study Was Conducted Among 100 Adult Patients Of Both Gender Of Asa I & II.All Patients Were Informed Regarding The Study And Written Consents Were Obtained.Patients Were Randomly Divided Into Two Groups Of 50 Each

Inclusion Criteria

- 100 Asa 1 And Asa 2 Patient Of Either Sex
- Age 20-60 Years.
- Patient Scheduled To Undergo Elective Surgical Procedures Under General Anaesthesia.

Exclusion Criteria:

- Urgent Surgical Procedure
- History Of Allergy With Clonidine Or Dexameditomidine.
- History Of Cerebrovascular, Neurological, Respiratory,Hepatic And Renal Disease,Hypertension And Pheochromocytoma.
- Heart Rate Less Than 60bpm
- Patient On Daily Beta Blockers, Anti Depressants, Antianexiety, Anticonvulsants Or Antipsychotics Drug Therapy

Group 1: Patients Received 1 Mcg/Kg Clonidine In 200ml Of Ns Over 10 Min.

Group2:Patients Received 0.25 Mcg/Kg Dexmedetomidine In 200ml Ns Over 10 Min.All The Patients Were Assessed The Day Before Surgery And Written Consent Obtained.Standard Anaesthsia Technique Was Used In Both The Groups.

On arrival in ot room iv access was secured and 200 ml ns mixed with 1 mcg/kg clonidine or 0.25 mcg/kg dexmedetomidine was started. Monitoring of Nibp,Hr, Ecg And Spo2 Was Carried Out. Patients Were Induced After 15 Min Of Clonidine Or Dexmedetomidine

Administration. Premedication With I/V 0.03 Mg/Kg Midazolam And 2 Mcg/Kg Fentanyl Was Given, After 3 Min Of Preoxygenation Anesthesia Was Induced With I/V Thiopentone 5 Mg/Kg And 0.1mg/Kg Vecuronium,3 Min Later Direct Laryngoscopy And Intubation Was Performed. Duration Of Laryngoscopy And Intubation Was Limited To A Minimum Possible Time, And Was Less Than 30 Seconds For All Patients.Haemodynamic Parameters As HR Sbp,Dbp ,Map Were Noted At Before Induction,After Induction After Laryngoscopy And Intubation And 5 Min After Laryngoscopy And Intubation.Maintenance Of Anaesthesia Was Carried Out Using N2o And O2 Mixture And Isoflurane With Controlled Ventilation. At The End Of Surgury, Residual Neuromascular Block Was Reversed With Neostigmine 0.05mg/Kg And Glycopyrolate 0.1mg/Kg I/V.

All The Analysis Were Done Using Microsoft Excel Package And Result Was Represented As Mean +- Sd, Chi Square Test Was Used For Categorical Data(Age ,Gender ,Weight , Asa Grade) And Paired T Test Was Used For Intragroup Comparison Of Change From Before Induction Value To Different Study Periods(Each Group Separately). P Value Of 0.005 Or Less Was Considered As Statically Significant.

Discussion

Direct laryngoscopy and intubation is stressful stimulation associated with increased sympathetic activity and increased catecholamine levels in blood leading to tachyarythmias[12-16].

In our study dexmedetomidine 0.25mcg/Kg and clonidine 1mcg/Kg were used for attenuation of sympathetic response to laryngoscopy and intubation. dexmedetomidine has been studied by few authors in a dose of 0.5mcg/Kg[6], No study has been done to see the efficacy of dexmedetomidine in a dose of 0.25 Mcg/Kg for attenuation of laryngoscopy and intubation response. Hence in this study we choose to inject dexmedetomidine in a dose of 0.25mcg/Kg And Compared It With Clonidine 1mcg/Kg For Attenuation Of Laryngoscopy And Intubation Response. All Patients Were Induced With Fentanyl Followed By Thiopentone , as several studies have shown that fentanyl attenuate the haemodynamic response to laryngoscopy and intubation[5].As both this group of patient received fentanyl ,the occurrence of any bias was eliminated. timing of administrating the drug was 15 min prior to the induction as the distribution ½ life of dexmedetomidine is approximately 6 min and for clonidine 6-14 min, Ferdi Et al ,Keniya Et al ,Wright Et al, Have Administered Clonidine And Dexmedetomidin 15 Min Before Intubation [3,4].Menda Et al, Keniya Et al, And Bajwa et al,Gave1mcg/Kg Of Dexmedetomidine As Iv Infusion Over 10-15min Before Laryngoscopy, Result Was Dexmedetomidine Is Effective In Reducing Stress Response During Laryngoscopy And Intubation [2,3,9]. Similar In Our Study As Dexmedetomidine Is Effective In Laryngoscopy And Intubation.The Safety And Efficiancy Of Dexmedetomidine Was Shown By Keniya Et al, They concluded that dexmedetomidine as a premedicant is effective in attenuating stress response to intubation with significant anaesthetic and opioid sparring effect[3]. In 2012 Bejoy Kumar Panda Et al, Compared 1mcg/Kg dexmedetomidine And 1mcg/Kg Clonidine For Sympatho Adrenal Response, Perioperative Drugs Requirement And Cost Analysis, Result Was Signifacant Reduction In Sbp,Dbp And Hr In Dexmedetomidine Group As Compared To Clonidine[1]. Similar Results Were Obtained In Our Study.

Smitha Et al[6], Compared The Effect Of 0.5mcg/Kg And 1mcg/Kg Dexmeditomidine With Normal Saline For Attenuating Stress Response. Result Was Dexemeditomidine Is Effective For Reducing Stress Response From Normale Saline,And 1mcg/Kg Is More Effective Then 0.5mcg/Kg In Controlling Hemodynamic Response .In Our Study 0.25mcg/Kg Dose Is Effective In Attenuating Stress Response During Laryngoscopy And Intubation.Anish Sharma And Shankarnarayan , Also Compared The Effect Of Dexmedetomidine And Clonidine To Reduce Stress Response During Intubation, They Found That, Dexmedetomidine Is Better Than Clonidine To Reduce The Tachycardia Response[10],Result Was Similar To Our Study Sarkar Et al, Used 3mcg/Kg Of Clonidine And 0.5mcg /Kg Dexmedetomidine And Result Was Both Clonidine And Dexmedetomidine Were Effective(8). But In Our Study Dexmedetomidine Is More Effective Than Clonidine.As Probably They Used Higher Dose Of Clonidine I.E.3mcg/Kg

Bon Sebastian, Anand T Talikoti Compared Two Dose Of Dexmedetomidine 0.5 And 0.75 Mcg/Kg, For Reducing Stress Response During Laryngoscopy And Intubation[7].They Concluded That 0.75mcg/Kg Is More Effective Then 0.5mcg/Kg .In Our Study Dexmedetomidine Even At 0.25mcg/Kg Is Also Effective In Reducing Stress Response During Laryngoscopy And Intubation. This Study Has Limitation As We Didn't Measure The Stress Mediator (Catecholamine Levels)In Blood. And We Included Asa Class I &Ii Patient With No Cardiac, Neurological Diseases. In Our Study, Population Having Cardiac And Neurological Issues Were Not Included .We Recommend further studies measuring Catecholamine Level Preferably In Cardiac Patient.

Result

There Were No Stastically Significant Differences(P>.0.005) Between The Two Groups In Terms Of Demographic Profile.

Table 1: Demography table

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SEX	CLONIDINE	DEXME.	TOTAL	X2	P VALUE
MALE	18	20	38	0.16	0.68
FEMALE	32	30	62		
AGE					
20-30	5	6	11		
30-40	14	14	28	4.88	0.18
50-60	12	20	32		
60-70	19	10	29		
WEIGHT					
41-50	6	7	13		
51-60	18	12	30	1.71	0.42
61-70	26	31	57		
ASA					
ASA-1	42	45	87	0.79	0.37
ASA-2	8	5	13		

In our study we found that heart rate,diastolic blood pressure,systolic blood pressure and mean arterial pressure were attenuated more in dexmedetomidine 0.25mcg/kg group and there was stastically significant difference($p<0.005$) from clonidine1mcg/kg group.

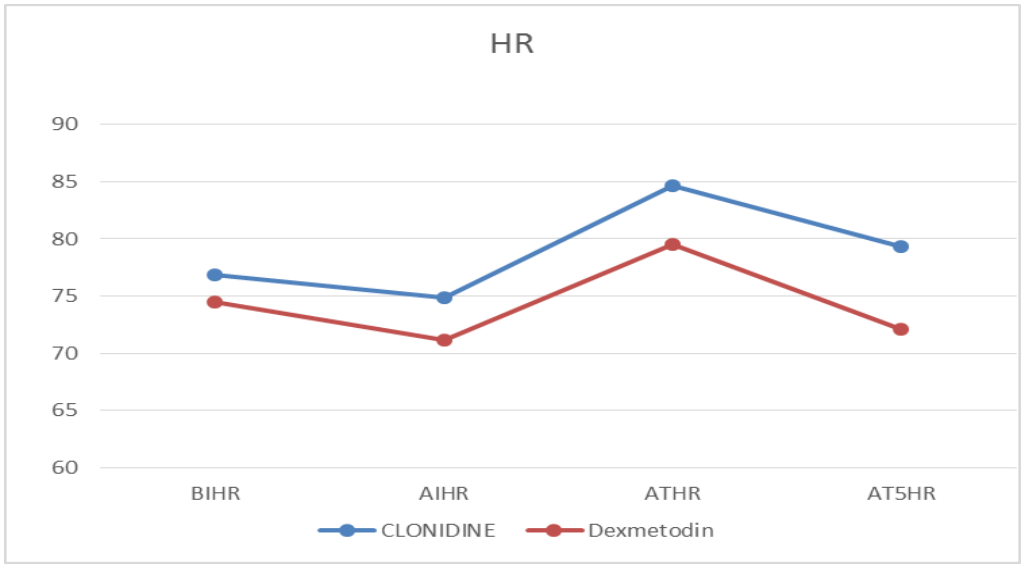

Fig 1: Heart rate

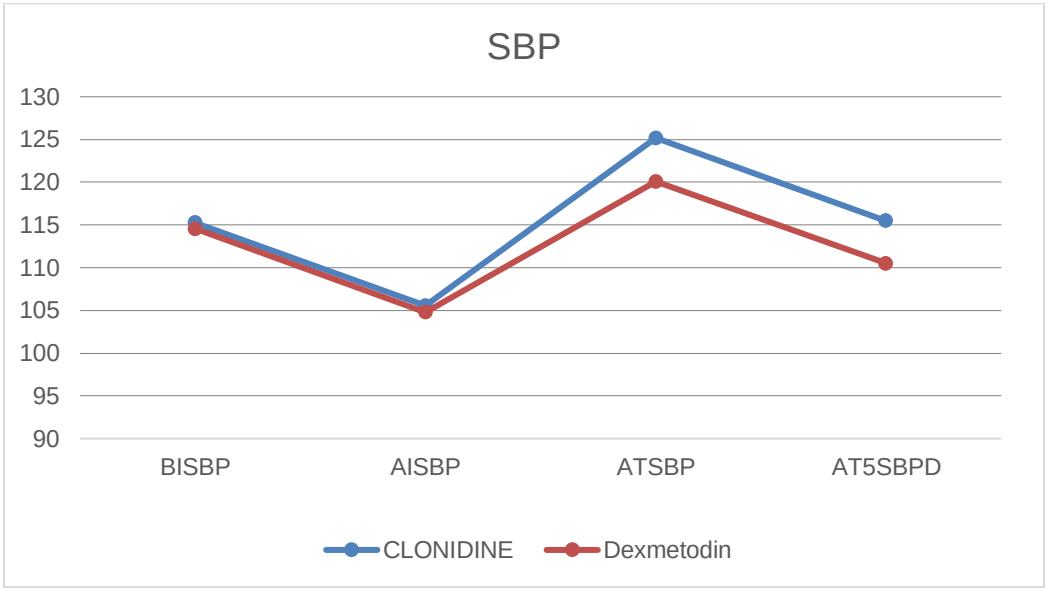

Fig 2: Systolic blood pressure

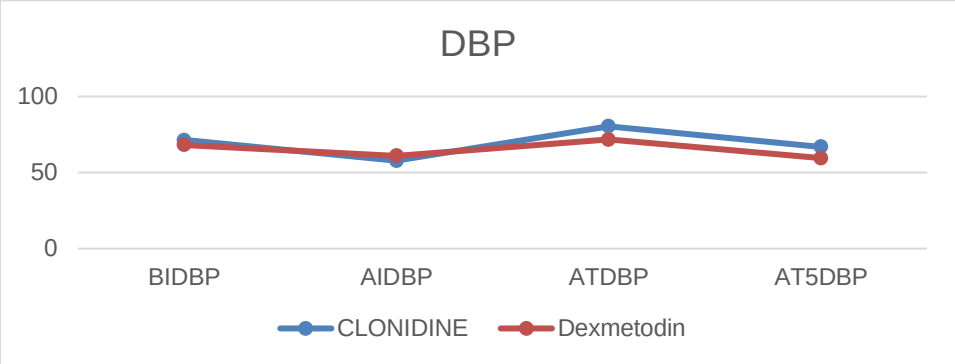

Fig 3: Distolic blood pressure

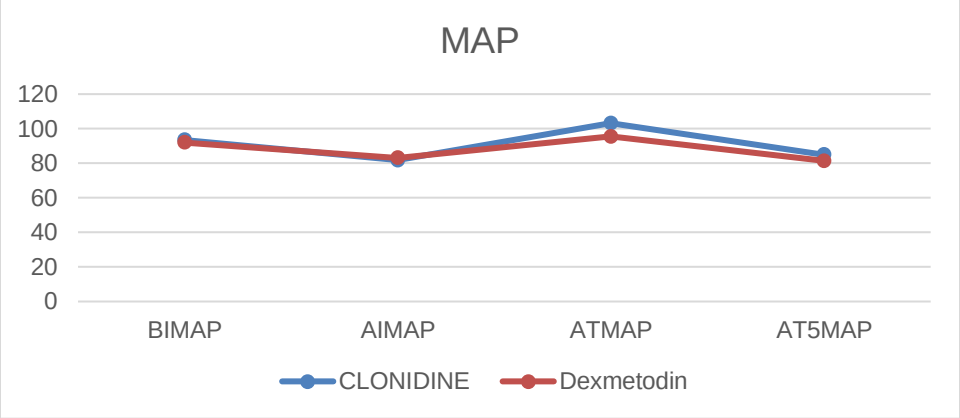

Fig 4: MAP

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