



## Effects of Intravenous clonidine on Hemodynamic Parameters In Patients Undergoing Modified Ect

A.Asghar Ali,G.Sivakumar  
Department of Anaesthesiology  
KAPV Government Medical College, Trichy

### Abstract

#### Background :

Electroconvulsive therapy (ECT) (is the most effective treatment available for the acute treatment of depression in patients who do not respond to medications . It is generally used as a second line treatment for many psychological disorders, mainly major depression and schizophrenia where medication is not effective .ECT is often associated with some complications such as hypertension, tachycardia arrhythmia and even myocardial infarction .Various methods have been used for prevention or control of these cardiovascular side effects.

#### Aim:

To evaluate the effects of intravenous clonidine 1mcg/kg ( on hemodynamic response, duration of seizure activity and recovery characteristics to modified ECT

#### Materials and methods:

This prospective randomized crossover clinical trial was performed on 30 patients aged 20-50 years with ASA I and II who were candidates for ECT .Prior to ECT, each patient received intravenous infusion of clonidine 1mcg/kg (and a normal saline 10 minutes prior to induction at different sittings

.Baseline Heart rate, systolic, diastolic and mean arterial pressures were noted just before securing the intravenous cannula .The same parameters at 1, 2, 5,10,20,30,60 minutes and 2,4 hrs were noted.Motor Seizure duration noted and Time to recovery noted .Statistical analysis was done using paired students' t' test

#### Results

Attenuation of maximum rise in the heart rate, systolic BP, diastolic BP and mean arterial pressure and increase in recovery time by intravenous clonidine 1mcg/

kg (was evident and statistically significant when compared with control group.

#### Conclusion:

To conclude, clonidine at a dose of 1µg/kg attenuates the hemodynamic response of ECT without any change in the seizure duration with a slight delay in time for recovery

#### Keywords:

Electroconvulsive therapy, hemodynamic response, oral clonidine.

#### Introduction

Electroconvulsive therapy (ECT) (is the most effective treatment available for the acute treatment of depression in patients who do not respond to medications) . [1]The efficacy of ECT has also been well documented in mania and some forms of schizophrenia .[2]The aim of ECT is to produce a grand mal seizure .It is the seizure rather than the electrical stimulus which is responsible for the therapeutic effect .The seizure also causes wide spread physiological changes, particularly affecting the cardiovascular and the nervous system [3].These are most commonly a transient period of hypertension and changes in the heart rate (HR) ,(which can be hazardous as many patients who require ECT are elderly and have cardiac and cerebrovascular diseases .These cardiovascular changes may be altered using various preanesthetic agents with anesthetic drugs and convulsions can be reduced by the usage of muscle relaxants .The ideal premedicant should have sedative, anti-anxiety, analgesic, anti-emetic, and antisialogogue properties and should not impair cardiovascular stability or depress the respiration .α2 adrenergic agonists attenuate stress-induced sympathoadrenal responses to painful stimuli, improve intraoperative hemodynamic stability, and reduce anesthetic requirements during surgery .Clonidine is

centrally acting  $\alpha_2$  adrenergic agonist with well -characterized antihypertensive properties . $\alpha_2$ -adrenoceptor agonists are mainly used as antihypertensive agents but have many properties of ideal premedicant[4]

### Aim

-To evaluate the effects of intravenous clonidine on hemodynamic response to modified ECT

-To assess the duration of seizure activity and recovery characteristics.

### Materials and methods:

This is a randomised prospective double blinded cross over study conducted in our institution. Age 18-60-years, Schizophrenia, mania, depression, ASA I-II are included in this study and exclusion criteria was Cardiovascular disease, cerebrovascular disease, Intracranial hypertension, Respiratory tract disease, Patients with HR less than 60 bpm, SBP less than 100 mm of Hg, Patients with contraindication for ECT.

A total of 30 patients were scheduled for the study .Pre-anaesthetic evaluation was done on the day before the procedure. A written informed consent was taken from their relatives. The study was done in repeated crossover pattern) same patient received normal saline and clonidine in two different sittings .(In ECT room drugs were prepared by my Assistant professor not involved in the study .Administering drugs and monitoring were done by the principal investigator who did not know about the preparation. Patients were allocated as Group S when received 100ml of plain normal saline intravenously over 10 minutes prior to induction .Same patients were allocated Group C when received clonidine 1  $\mu$ g/kg in 100ml saline .Premedication T .Ranitidine 150 mg & NPO from 10 pm. Inj. Glycopyrrolate 0.2 mg i.m 30 min before procedure 18 gauge i.v .cannula was inserted ,Standard monitors such as HR, SBP, DBP, MAP, ECG and SpO<sub>2</sub> & baseline parameters were noted before securing IV cannula .Study drug or saline was administered. Preoxygenation for 3 min, Inj . Propofol 1mg/kg i.v was given. Right forearm was isolated with tourniquet & Inj .Suxa 0.5 mg/kg iv given. After placing Bite block, ECT was given. Mask ventilation with 100 % oxygen continued until patient resumed adequate spontaneous breathing.

Hemodynamic parameters at 1, 2, 5, 10, 20, 30, 60 minutes and 2, 4 hrs .HR fall > 20 % from baseline Inj .Atropine 12 mg given. BP fall > 20 % from baseline, Inj .Ephedrine 6mg given. Motor Seizure duration noted and tourniquet deflated . Time to recovery) Time from the end of succinylcholine administration to the onset of spontaneous breathing, eye opening, and obeying commands (are recorded. Statistical analysis was done using paired students' t' test

## RESULTS & OBSERVATION

### Demographic Data:

In this study 30 patients of different age groups of either sex and different psychiatric illness was selected randomly.

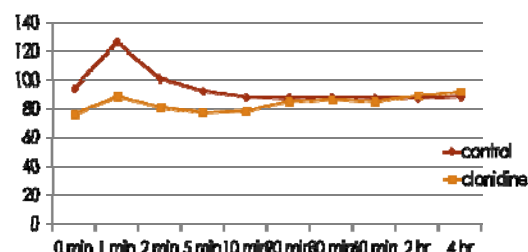
Parameters	(n(30=	(100%)
<b>Age</b>		
Below 20 yrs	4	13%30.
21-30-yrs	9	30%
31-40-yrs	14	46%70.
Above 50 yrs	3	10%
<b>Sex</b>		
Male	17	56%70.
Female	13	43%30.
<b>Psychiatric disease</b>		
BPD	17	56%70.
Shizophrenia	13	43%30.

### Hemodynamic parameters

The maximum changes in HR, SBP, DBP and MAP after the ECT stimulus were smaller in the Group C) clonidine (compared with the Group S) control. (

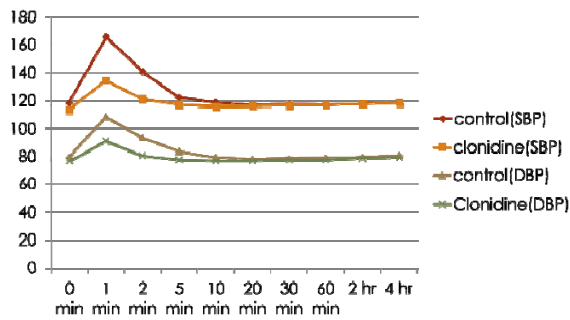
#### Heart rate:

When heart rate were compared it showed statistically significant decrease in clonidine group than with control group at 0, 1, 2, 5, and 10 min.



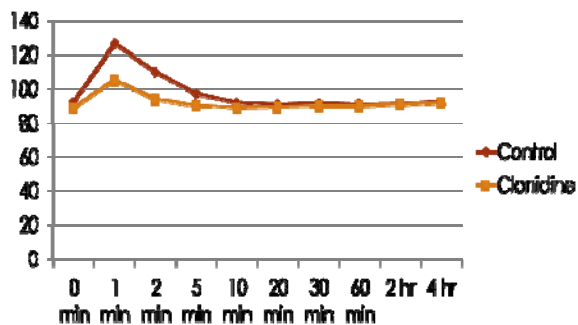
#### SBP and DBP:

The SBP when compared with control group showed a statistically significant decrease in clonidine group at 0, 1, 2 min and DBP showed a statistically significant decrease in clonidine group at 0, 1, 2, and 5 min.



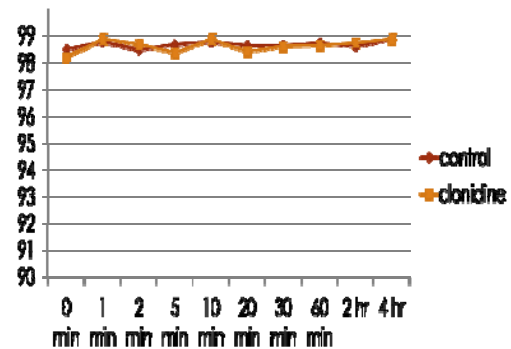
#### MAP:

When MAP compared with control group it showed statistically significant decrease in clonidine group at 1,2,5 minutes.



	Group S	Group C	P value
0 min	92.6±4.86	89.17±4.34	0.006
1 min	126.73±11.81	105.43±4.81	0.000
2min	110.27±11.13	94.23±3.25	0.000
5 min	97.67±9.01	90.67±2.63	0.000
10 min	92.27±6.7	89.47±2.16	0.033

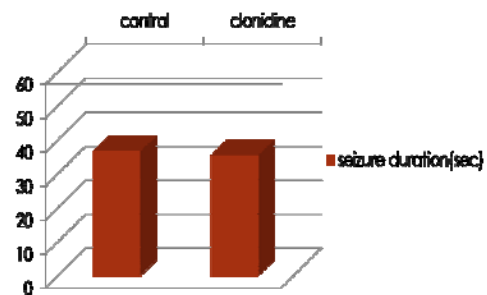
#### Spo2:



At any time after the drug administration and the ECT stimulus there is no statistically significant difference in saturation between both groups) p value >0(05).

#### Seizure duration:

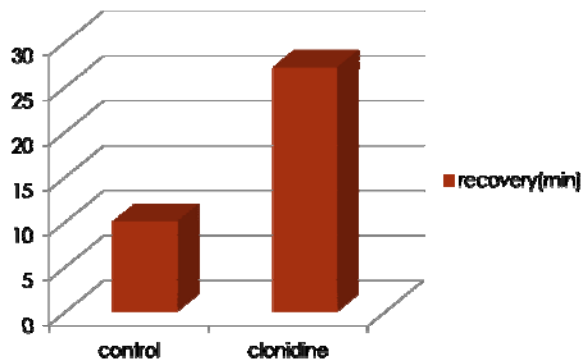
There is no statistically significant change in seizure duration between both groups



	Group S	Group C	P value
Seizure duration(sec)	36.57±3.42	35.40±3.41	0.191

#### Time of recovery:

When compared with control group there is statistically significant increase in recovery time in clonidine group .



	Group S	Group C	P value
Time to recovery(min)	10.03±2.28	27.13±3.62	0.000

## Discussion

In our study there is a significant fall in SBP,DBP,MAP in clonidine group compared to normal saline which is consistent with study done by Fu Wen et al [5] on oral clonidine effects on ECT .similar results were obtained by Ravichandra Dodawad et al .[6] on effects of 0.6µg/kg of dexmedetomidine in the attenuation of stress response after electroconvulsive therapy

In our study, there is significant fall in heart rate in clonidine group which is consistent with results obtained by Ravichandra Dodawad et al, but in study done by Fu Wen et al there is no significant difference in heart rate

In our study, there is no significant change in seizure duration between two groups.same results were obtained by Fu Wen et al

Time to recovery does not show significant changes in study by Fu Wen et al.But in our study time to recovery is more in clonidine group which may be advantageous as it reduces postictal agitation in patients undergoing ECT.

## Conclusion:

To conclude, clonidine at a dose of 1µg/kg attenuates the hemodynamic response of ECT without any change in the seizure duration with a slight delay in time for recovery.

## References:

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