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EFFECTS OF DEXMEDETOMIDINE IN THE MANAGEMENT OF ALCOHOL WITHDRAWAL PATIENTS ADMITTED IN INTENSIVE CARE UNIT

General Medicine

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ABSTRACT

Background: Patients admitted in intensive care unit for alcohol withdrawal generally necessitate the need of CNS depressors like benzodiazepines, haloperidol. However off label usage of dexmedetomidine, a highly selective α2-agonist has shown drastic effect in controlling the autonomic symptoms seen in these patients. This is a retrospective analysis of 31 patients admitted in intensive care unit for alcohol withdrawal and who were treated with dexmedetomidine as a sedative. **Material And Methods:** Study was conducted on alcohol withdrawal patient who have received dexmedetomidine admitted in mixed medical and surgical ICU setting with 12 beds from November 2023 to May 2024. The main analysis compared alcohol withdrawal severity scores and medication doses for 24 h before dexmedetomidine therapy with values during the first 24 h of dexmedetomidine therapy. **Results:** A total of 31 subjects with all being males belonging to the age group of 20 to 45 years with a means age of 27.3 years (Range of 25.5-44.8years) .All the 31 Patients involved in the study survived to discharge and none of them where recorded to go into bradycardia in the course of stay and reduction in alcohol withdrawal severity score was seen. **Conclusions:** Observational study has shown that dexmedetomidine therapy for severe alcohol withdrawal patient has shown a decrease in alcohol withdrawal scoring.

KEYWORDS

Alcohol withdrawal syndrome, Dexmedetomidine, Intensive care unit

INTRODUCTION

Ethanol being the commonest alcohol consumed in India is a major cause of incidence of alcohol withdrawal cases. It acts as a central nervous system (CNS) depressant by inhibiting the glutamate receptors and agonizing the GABA receptors.(Adinoff, 1994)

Alcohol dependence with withdrawal (ICD 10 - F10.23) is a mental and behavioral disorder due to use of alcohol in long term. It has a wide spectrum of presentation ranging from a mild uncomfortable state to a serious, life-threatening condition. Delirium tremens is one of the severe forms of alcohol withdrawal. It presents with global confusion and autonomic hyperactivity which can even end up in cardiovascular collapse. Autonomic hyperactivity include hypertension, vasoconstriction, tachyarrhythmia, hyperhidrosis, peripheral , and hyperthermia or hypothermia.(Mayo-Smith et al., 2004)

When a chronic intaker abruptly discontinues alcohol consumption, the central nervous system loses the external inhibitory effect it was accustomed to and becomes overexcited. This ultimately pushes the body into a state of excitatory overload, leading to a wide range of symptoms and signs. These patients are mainly managed with supportive therapy in the form of sedation, thiamine supplementation, and multivitamin supplementation, and intravenous rehydration, correction of electrolyte abnormalities, CNS depressors like benzodiazepines, haloperidol and other co-morbid conditions. In this study we will analyze the effects of Dexmedetomidine in the management of alcohol withdrawal patients admitted in Intensive care Unit.

Dexmedetomidine is a non-opioid, highly selective alpha 2 receptor agonist. It is well known for its usage in intensive care units as a sedative mainly for perioperative patients, intubated or mechanically ventilated patients. It's off label uses include treatment in insomnia, delirium, pain control, alcohol withdrawal.(Tan & Ho, 2010)

MATERIAL AND METHODS

Study Design: Observational study

Place Of Study: Military hospital, Jabalpur

Duration Of Study: November 2023 to April 2024

Sample Size: 31 alcohol withdrawal patients admitted in ICU setting during the study period

Eligibility Criteria:
Male and female patients of age group 20 to 45 years admitted in ICU with alcohol withdrawal who received ICD 10 code F10.23

Exclusion Criteria:
1. Patients <25 years or > 45 years
2. Patients in ICU with diagnosis other than alcohol withdrawal
3. Patient with severe comorbid disease

Data Collection
All the patients falling into the eligible criteria were involved in the study. After informed written consent from patients attender, we recorded the alcohol withdrawal severity scores before dexmedetomidine therapy with values during the first 24 h of dexmedetomidine therapy and further All the data was collected in a predefined MS excel sheet.

RESULT

A total of 31 subjects with all being males belonging to the age group of 20 to 45 years with a means age of 27.3 years (Range of 25.5-44.8years).

All the 31 Patients involved in the study survived to discharge and none of them where recorded to go into bradycardia in the course of stay.

The mean ICU stay duration was 73.6 hours (range: 58 hours to 92.6 hours) and the mean of dexmedetomidine therapy duration was 49.3 hours (range 48 hours to 76.4 hours) with a mean dosage of dexmedetomidine being 0.5 mcg/kg/hr. None of the 31 patients required intubation in the hospital stay. Effect of various parameters was observed after initiation of dexmedetomidine. Table 1 showing other laboratory parameters.

Alcohol Withdrawal Scoring:
31 patients were analyzed for alcohol withdrawal scoring. There was a decrease in score observed after 24 hrs initiation of dexmedetomidine therapy. Mean decrease of 2 points observed.

Heart Rate:
31 patients were further analyzed for Heart rate. There was mean decrease of 24 beats per minutes was observed following dexmedetomidine therapy.

Blood Pressure:
In 31 patients mean decrease of 15mm Hg of systolic blood pressure was observed following 24hrs of dexmedetomidine therapy. Out of 31 patients 18 were already on antihypertensive medication and were continued with the same during hospital stay. Further 4 patients received IV Labetalol during ICU stay.

Table -1: Lab Parameters In Study Population

Parameter	MEAN value in study population	Range
SGOT	47.6 u/l	38.8-54.6 u/l
SGPT	53.7 u/l	48.4-60.2 u/l

MCV levels	96.7fl	83-104fl
CPK levels	118.8 mcg/l	97.6-134.6mcg/l
GGT at admission	90 u/l	35-190 u/l

DISCUSSION

The study was conducted on patient admitted in ICU setting for severe alcohol withdrawal symptoms. Patient was all being males belonging to the age group of 20 to 45 years .The highest number of males in our study as compared to other studies might reflects the clientele of our health facility those are mostly the serving armed force personnel. Similar study was conducted has shown there were 19 male subjects and 1 female subject, with a mean age of 44.9 years (Rayner et al., 2012)

In our study patient was given mean dosage of dexmedetomidine being 0.5 mcg/kg/hr. None of the 31 patients required intubation in the hospital stay and no patient developed bradycardia. Literature suggest association of bradycardia with Dexmedetomidine therapy (Tan & Ho, 2010).Hence continous monitoring of patient vitals is required.

In our study there was decrease in autonomic activity was observed such as rigidity, tremors, sweating, agitation, after dexmedetomidine therapy. There were several studies supporting the change in autonomic activity in animal model (Riihioja et al., 1999)

Dexmedetomidine is α2 receptors agonist has shorter half-life and rapid onset of action (Venn et al., 2002). Being α2 receptors agonist it leads to analgesic effect, sedation, inhibit cardiac vagal tone .(Prommer, 2011)No respiratory depression is seen following dexmedetomidine therapy(Venn et al., 2000).

CONCLUSIONS

Benzodiazepine is commonly used drug for alcohol withdrawal patients but often associated with respiratory depression, delirium, Hence use of dexmedetomidine therapy can be used as alternative. Many patients alcohol withdrawal/ Delirium tremens have tachycardia and are in risk of developing tachyarrhythmia. Dexmedetomidine causes bradycardia as side effect which is being utilized here as additional therapeutic effect to sedation in alcohol withdrawal/ Delirium tremens treatment . Following with dexmedetomidine therapy there was decrease in alcohol withdrawal score decrease in other autonomic activity like tremors, sweating, agitation and nausea was observed.

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