



## NEUROLOGICAL DISORDERS ASSOCIATED WITH CHRONIC ALCOHOLIC CONSUMPTION IN PATIENTS ADMITTED TO SVS HOSPITAL, MAHABUBNAGAR, TELANGANA STATE – A FIVE-YEAR STUDY WITH REVIEW OF LITERATURE.

### Internal Medicine

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### ABSTRACT

**Background:** The neurological complications of alcoholism include both the peripheral and the central nervous system like the alcohol withdrawal syndrome which includes alcohol withdrawal seizures, delirium tremens, alcohol hallucinosis, alcoholic peripheral neuropathy, alcoholic myopathy, Wernicke encephalopathy, combination of Wernicke encephalopathy with Korsakoff's psychosis. **Materials and methods:** A total of 134 consecutive patients without a prior diagnosis of neurologic disease presenting with seizures or other neurologic disorder, and a chronic use of various alcohol intake were studied and investigated. **Observations:** 74(53.33%) cases had withdrawal seizures, polyneuropathy in 18(13.43%) cases, Alcoholic compressive neuropathy and Korsakoff's psychosis noted in 12(8.96%) cases each, alcoholic myopathy in 10 and Wernicke's neuropathy was seen in 8(7.42%). **Discussion:** The present study was compared with various earlier studies and tabulated.

### KEYWORDS

Alcoholism, Withdrawal Seizures, alcoholic Peripheral Neuropathy, Alcoholic Myopathy, Wernicke's and Korsakoff's syndrome

### INTRODUCTION:

Alcohol is one of the most abused substances in the world. A neurological complication of alcohol dependence is extremely common and affects every level of neuroaxis including the brain, peripheral nerves, and muscle. As per WHO, worldwide, an estimated annual three million deaths and 5.1% of Disability-Adjusted Life Years (DALYs) of the world are attributed to alcohol consumption<sup>1</sup>. Alcohol consumption in India has substantially increased in the last decade. On an average, 30% of Indians consume alcohol, out of which 4–13% are daily consumers and more than half of those who consume alcohol are hazardous drinkers<sup>2</sup>. ICMR bulletin (2008) estimated 62 million alcoholics in India<sup>3</sup>. Interestingly, despite its historical relevance and wide prevalence, it was not until the late 1950s that it was definitively proved that the alcohol withdrawal syndrome (AWS) is a combination of varied physiological manifestations that occur on a continuum as a response to the sudden cessation or reduction of alcohol consumption<sup>4</sup>.

According to the World Health Organization (WHO), average alcohol consumption in India was 5.7 liters per person above the age of 15 per year in 2020, up from 4.3 litters in 2010. Alcohol related seizures (ARS) are defined as adult-onset seizures that occur in the setting of chronic alcohol dependence<sup>5</sup>. Victor and Brausch<sup>6</sup> stated that seizures occurred alcohol withdrawal in non-epileptic persons due to a transient disturbance of cerebral functioning during withdrawal.

### MATERIALS AND METHODS:

A total of 134 consecutive patients without a prior diagnosis of neurologic disease presenting with seizures or other neurologic disorder, and a chronic use of various alcohol intake to either emergency room or out-patient to department of General Medicine, SVS Medical College Mahabubnagar, Telangana state. The period of the study was for five years from first August 2014 to 31<sup>st</sup> July 2019. An informed and written consent was taken from the patient or immediate responsible attendant. An institutional ethic committee approval was obtained. All patients older than 15yrs of age presenting to medicine wards, SVS Medical college Hospital, Mahabubnagar with an episode of seizures included. All patients who had a proximate well known provoking cause of seizure (e.g., Subdural hematoma, dys-electrolytemia and hypoglycemia) other than alcoholism will be excluded from study. All patients with having neurological infections like meningoenephalitis, head injuries, known intracranial space occupying lesions (ICSOL). Patients with other substance abuse were also excluded. Total duration of alcohol intake, type of alcohol used, amount consumed per day, recent change in drinking habits. Amount of alcohol consumed in the bout preceding the seizure and Time interval between last bout and seizure. Withdrawal symptoms and its temporal relationship with seizure also assessed. Apart from detailed

examination, routine hematological and biochemical investigations for liver and renal functions. Serum electrolytes, sodium, potassium, calcium and magnesium, serum thiamine levels at the time of admission, computed tomography (CT) of the brain were done in all patients to rule out head injury and any other provoking cause for seizure. Magnetic resonance imaging of the brain will be done as when needed. An electroencephalography (EEG) was done in all the cases.

Patients were initially screened in outpatient department for alcohol use, using AUDIT, a 10-item questionnaire designed to detect hazardous and harmful drinkers that has been validated and is extensively used. Clinical Institute Withdrawal Assessment for Alcohol-revised (CIWA-Ar)<sup>7</sup> was used to rate the severity of withdrawal symptoms and to assess various symptoms associated with alcohol withdrawal seizures. This scale scores the severity of symptoms like nausea, sweating, agitation, headache, anxiety, tremor, sensory disturbances, and orientation adding up to a scale of 10. The scale has a total score of 67, out of which a score of 8 or greater is considered sufficient to require treatment for alcohol withdrawal. The data was analyzed using SPSS 20.0 package for Windows. All statistical tests were conducted at a two-sided 0.05 level of significance. Simple parameters were recorded as percentages. Mean and standard deviation were used to describe quantitative data. Pearson's correlation coefficient was used to assess the strength of association between two continuous variables.

### RESULTS:

**Table 1: Socio-demographic characteristics of the study sample**

VARIABLES	CONTROL N=50	ALCOHOL GROUP N=134
Gender ratio M:F	22:28 [44:56%]	72:62
Unmarried: married	18:32 [36:64%]	34:100
Employed: Unemployed	36:14 [72: 28%]	86:46
*No education: V: X: D+	8:14:16:12 [16:28:32:24%]	42:38:34:30
**Religion – H: M: C	40: 32: 28% [20:16:14]	90: 64: 64
# Habitat R: U	31:19 [62:38%]	96:48
\$ Income 5:10:20:21+	9:22:11:8 [18:44:22:16%]	44:36:32:22
Nuclear: Joint family	18:32 [36:64%]	68:76
Family H/O mental illness	7.2%	5.4%

\*upto V standard, upto X standard, D degree or above; \*\*Hindu, Muslim, Christian #Rural, Urban; #Rural, Urban; \$less than 5000, upto 10000, 20,000 and above

**Table 2: Distribution of the Age of Onset of Alcohol Consumption**

Age of onset of Alcohol consumption	Number of cases
<20 years	48
21 – 30 years	44
31 – 40 years	18
41 – 50 years	8
>51 years	16

**Table 3: The Percentage of Brand of Alcohol Used in Alcoholics**

Usual Brand of alcohol	Number of cases consume
Beer	32
Whisky	50
Rum	12
Brandy	12
Vodka	6
Country liquor	34

**Table 4: Neurologic disorders noted in this study**

Diagnosis	Number of cases	Percentage
Alcoholic withdrawal seizures	74	55.22
[Delirium tremens]	[72]	
Alcoholic polyneuropathy	18	13.43
Alcoholic compressive neuropathy	12	8.96
Alcoholic myopathy	10	7.42
Korsakoff's psychosis	12	8.96
Wernicke-Korsakoff's encephalopathy	08	5.97
Total	134	100

**Table 5: Time between last drink and admission to hospital in alcoholic withdrawal seizures [N=74]**

	Time duration	Number of patients
1	6 – 10 hours	8
2	1 – 3 days	36
3	4 – 6 days	28
4	7 and more days	4

**Table 6: Age Wise Distribution of the Various Neurological Complications in Alcoholics**

Diagnosis	Less than 30 years	31-40 years	41-50 years	> 51 years	Total
Alcoholic withdrawal seizures	36	22	14	2	74
[Delirium tremens]	[36]	[20]	[12]	[2]	[72]
Alcoholic polyneuropathy	–	2	12	4	18
Alcoholic myopathy	–	6	2	2	10
Korsakoff's psychosis	1	4	5	2	12
Wernicke-Korsakoff's encephalopathy	–	–	8	–	08

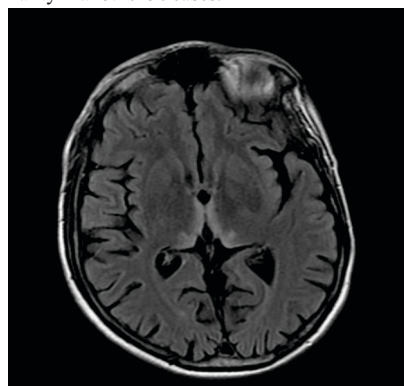
**Table 7: Comparison Of Type Of Seizure & Status Epilepticus.**

SL.NO	TYPE OF SEIZURE	NO. OF PATIENTS	% OF PATIENTS
1	GTCS	64	64 %
2	FOCAL	6	6%
3	STATUS EPILEPTICUS	6	6 %

**Table 8: Ct/mri Brain Findings Among The Cases**

CT-finding	Number of patients [218]
Cortical atrophy	32 %
Normal	68 %
MRI Finding	Number of cases [44]
Symmetrical increased signal intensity in dorsomedial thalami	4
Symmetrical increased signal intensity in mamillary bodies	2
FLAIR MRI of the brain demonstrates hyperintensities in the periaqueductal region and the medial thalami.	2
No abnormality	36

MRI of brain was done in 44 cases. Findings are as follows. T2 FLAIR showed symmetrical increased signal intensity in dorsomedial thalami in 4 cases and in mamillary bodies in another 2 cases and FLAIR MRI of the brain demonstrates hyperintensities in the periaqueductal region and the medial thalami in two more cases. MRI of brain did not show any abnormality in another 36 cases.



**Fig 1:** T2 FLAIR MRI of the brain demonstrates hyperintensities in the periaqueductal region and the medial thalami. Cerebral atrophy is also seen in this case.

**Table 9: EEG findings in 76 cases**

	EEG Abnormality	No of patients [N=74]	%
1	Normal	68	89.47
2	Abnormal features s/o seizure disorder	08	10.53

**DISCUSSION:**

Excessive consumption of alcohol causes an individual many problems and to the society. Gender, economic status, or educational qualifications did not bear any influence on the incidence of various neurological complications. The common syndromes are polyneuropathy, the withdrawal syndrome and the combination of Wernicke's encephalopathy and Korsakoff's psychosis. Other conspicuous clinical pictures include ataxia of cerebellar origin, convulsions, acute hallucinosis, myopathy and coma, while Marchiafava-Bignami disease and central pontine myelinolysis are rarely reported<sup>7,8and9</sup>. This study noted an equal prevalence among male (72) and female (62) cases. This is unique one which was not noted in other study. Alcohol withdrawal seizures occur within 48 – 72 hours of alcohol cessation, Rathlev et al also noted similar observation<sup>5</sup>. 74 had alcohol withdrawal seizures in this study, while 72 cases presented with delirium tremens which is characterized by a state of intense acute withdrawal state in the form of mental confusion, diaphoresis, agitation, fluctuating levels of consciousness, visual and auditory hallucinations associated with tremors and autonomic activity<sup>4</sup>.

Certain minor illnesses like headache, giddiness mild tingling and numbness, transient muscle cramps not included as done by Baghel V.S. et al<sup>10</sup>. Wernicke-Korsakoff Syndrome includes symptoms of Wernicke's encephalopathy along with global amnesia, which includes both retrograde and anterograde amnesia and confabulation<sup>6</sup>. Polyneuropathy is encountered in 58%–67% of alcohol abusers<sup>11and12</sup>.

Symptoms of alcohol polyneuropathy include paraesthesia, pain and weakness, reduced pain and temperature sensations confirmed by nerve conduction study<sup>16 and 17</sup>. In alcohol myopathy, the main complaints include muscle pain, severe cramps in the muscles, weakness of limbs particularly the proximal muscles and associated mild swelling and tenderness of muscles.

Gradual painless weakness along with varying degree of mild atrophy is characterise the chronic alcoholic myopathy. Excessive alcohol consumption is traditionally associated with 'Saturday night palsy', caused by compression of the radial nerve against the humerus for several hours. It usually occurs when the individual falls asleep with their arm hanging over the armrest of a chair or being compressed by the weight of the body. Clinically, it is characterised by an inability to perform dorsiflexion of the wrist and extension of the fingers. Neurophysiological studies using electromyography is useful both for diagnosis and prognosis, although the condition is self-limiting, and most patients recover within 3-6 months<sup>13</sup>. The various studies

reviewed in the literature and a comparison was done and tabulated in table 10.

**Table 10: Incidence of neurological abnormalities in percentage among the various studies**

Diagnosis	*Peng et al 1991	Kolke et al 2001	Jamir et al 2016	Baghel and Srivastava 2020	Present study [218]
Alcoholic withdrawal seizures	18.1%	–	38%	10%	34.86%
Delirium tremens			18.67%	14%	33.03%
Hallucination	30.7%	–	20%	14%	37.61%
Alcoholic polyneuropathy	74.3%	52%	9.33%	20%	8.26%
Alcoholic compressive neuropathy		–	–	–	5.50%
Alcoholic myopathy	16.7%	6%	2.67%	–	4.59%
Korsakoff's psychosis		–	5.33%	4%	5.50%
Wernicke-Korsakoff's encephalopathy	15.2%	–	6%	–	3.67%
Cerebellar degeneration	11.4%	8%	–	6%	–
Encephalopathy	56.2%	12%	–	–	–
Stroke	15.2%	2%	–	–	–
Hand tremors	37.2%	–	–	16%	–
Blackouts	–	–	–	12%	–
Dementia	–	–	–	4%	–

\* Most of the patients had manifestations of more than one problem

### Conclusions And Recondation:

Alcoholism in the society is on the raise due to many reasons. Neurologic manifestations differ from individual to individual and the etiopathogenesis of complications differ in different people. Some of the factors are the diet, patient's previous health, social and family help. The adverse effects of alcohol are known from ages. Active research is needed for understanding the biochemical effects of ethanol and pathophysiology in various ethnic groups across the globe particularly in India. This present study emphasizes to identify the target population early, counselling the person and the family to prevent full-fledged disease. Further research to design newer therapy to treat alcohol associated neurological disorders are the need of the hour.

### Limitations of the Study:

There was a great deal of heterogeneity between studies with respect to the definitions of alcohol abuse and the means used to diagnose peripheral neuropathy<sup>14</sup>. Alcohol misuse/addiction was defined in many ways, sometimes using validated criteria such as diagnostic and statistical manual of mental disorders. With regards to neuropathy, the present study aimed to be clear whether patients were diagnosed based upon clinical features, nerve conduction studies or both when discussing prevalence. The variation in definitions of alcohol abuse, however, was not resolve There was a great deal of heterogeneity between studies with respect to the definitions of alcohol abuse and the means used to diagnose peripheral neuropathy. Nutrition and liver function were not addressed in many studies. Therefore, in some studies it cannot be certain to what degree the neurological dysfunction is a consequence of alcohol toxicity. Thiamine levels in this study were almost normal or marginally low.

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