



CORRELATION OF SERUM MAGNESIUM LEVELS IN ALCOHOL WITHDRAWAL SYNDROME IN A TERTIARY CARE HOSPITAL: A CROSS SECTIONAL STUDY

General Medicine

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ABSTRACT

Alcohol use disorders includes an entire spectrum of diseases ranging from a cluster of behavioral and physical symptoms that includes withdrawal, tolerance and craving. The two major issues of alcohol related illnesses are abnormalities in serum electrolytes and osmolality and alcohol withdrawal syndromes. Among alcoholics the continued urinary excretion of magnesium despite very low levels has been noted. **Aim:** To measure the serum magnesium levels in chronic alcoholic patients who had abstained from alcohol for a minimum period of 6 days. To estimate its relation with the severity of alcohol withdrawal symptoms. **Materials and Methods:** A Total of 100 Patients with alcohol withdrawal symptoms admitted in the wards of General medicine in Santhiram medical College and General hospital, Nandyal. **Results:** In this cross sectional study, 100 patients with alcohol withdrawal syndrome were studied with respect to their CIWA-Ar score which determines the severity of symptoms

- Among the 100 patients, 21% belonged to 20 to 30year age group, 28% belonged to 31 to 40year age group, 27% in the 41- 50year age group, 18% in the 51- 60year age group and around 6% in the above 60year age group as noted.
- Among the patients observed, 66% of patients had a history of alcohol binge, 34% patients had a previous history of alcohol intake for the past 5 to 10 years and 57% of patients also had a history of concomitant smoking in the past as evident.
- Among the selected 100 patients, 13% of the patients were found to be diabetics, while 28% were hypertensives. The median CIWA-Ar score in this study group was 23.

Around 56 patients with values above the median value of 23 had a mean serum magnesium levels of 0.7036 which is severe magnesium deficiency while 44 patients with a score less than 23 had a serum magnesium level of 1.65 and the serum magnesium levels seem to correlate inversely with the CIWA Ar score, with patients with a score more than 20 had mean serum magnesium levels less than 0.7103. **Conclusion:** Magnesium deficiency is commonly found among chronic alcoholics with a prevalence of 90% noted in our study. It is essential to screen these patients for magnesium deficiency as the patients with higher CIWA-Ar score of above the median were observed to have severe magnesium deficiency. Hypokalemia seems to be a confounding factor with hypokalemia causing hypomagnesemia. Though serum sodium levels correlated inversely with the CIWA-Ar score, it was not significant enough to establish that hyponatremia could be a risk factor. Serum urea did not correlate with the severity of symptoms among patients with alcohol withdrawal. Duration of alcohol intake seems to be a risk factor while the abstinence period did not seem to affect the CIWA-Ar score

KEYWORDS

INTRODUCTION

Alcohol is the 3rd largest risk factor for disease burden all over the world causing nearly 3.5 million deaths each year.

There is a 38 percent increase in the overall alcohol consumption in the last 7 years in India.

It is one of the greatest causes of poverty in India.

The two major issues of alcohol related illnesses are abnormalities in serum electrolytes and osmolality and alcohol withdrawal syndromes.

Among alcoholics the continued urinary excretion of magnesium despite very low levels has been noted. Apart from magnesium, characteristic electrolyte imbalances noted among these patients are hyponatremia and hypokalemia especially among cirrhotic patients with a generalized volume overload state.

Overall causes for magnesium deficiency among alcoholics include inadequate intake, malnourishment, loss during vomiting, ethanol metabolism related urinary losses.

Though the mechanism is uncertain, inability of kidney to retain magnesium appears to be a major contributing factor.

Aims and Objectives:

- To measure the serum magnesium levels in chronic alcoholic patients who had abstained from alcohol for a minimum period of 6 DAYS
- To estimate its relation with the severity of alcohol withdrawal symptoms

MATERIALS AND METHODS

A Hospital-based cross-sectional study was conducted in the Department of General Medicine Santhiram Medical College, and General Hospital for six months after approval from the Hospital

Ethics and Research Committee.

Duration of Study: From december 2024 to May 2025

Sample Size: 100

Methods of Data Collection:

Sampling Technique: Simple Random Sampling

- This is a hospital based cross sectional study.
- After obtaining clearance and approval from the institutional ethics committee, 100 patients will be selected as per the inclusion and exclusion criteria.

Serum magnesium levels will be estimated and the levels will be compared with the severity of symptoms as outlined by the CIWA Arscale

Inclusion Criteria:

1. Patients with symptoms and signs of Alcohol withdrawal syndrome meeting DSM-5 criteria for alcohol withdrawal syndrome
2. Patients with Abstinence from alcohol for a minimum of 6 DAYS
3. Age >21 years and Male patients
4. Patients who are willing to participate and willing to give informed and written consent

Exclusion Criteria:

1. Patients with seizure disorder
2. Patients with neurological conditions that predispose them to tremors, nausea, vomiting.
3. Patients with history of other substance abuse
4. Patients with psychiatric illness that could cause hallucinations and delirium
5. Patients with malabsorption syndrome or chronic renal failure
6. Patients on diuretics
7. Patients on magnesium supplements
8. Female alcoholic patients
9. Patients who are not willing to participate and not willing to give informed and written consent

Data Analysis
RESULTS

Table 1 Showing Number Of Patients According To Age And Sex Distribution

Age	FREQUENCY	PRESENT
20-30yrs	21	21
31-40yrs	28	28
41-50yrs	27	27
51-60yrs	18	18
ABOVE 60yrs	6	6
TOTAL	100	100

Table 2 : History Of Alcohol Binge

HISTORYOF ALCOHOL BINGE	FREQUENCY	PRESENT
YES	66	66
NO	34	34
TOTAL	100	100

Table 3 Total Duration Of Alcohol Consumption

TOTAL DURATION OF ALCOHOL CONSUMPTION	FREQUENCY	PERCENT
<5 YEARS	27	27
5-10 YEARS	34	34
10-15 YEARS	28	28
15 -20 YEARS	11	11
TOTAL	100	100

Table4 Associated History Of Smoking

SMOKING	FREQUENCY	PERCENT
YES	57	57
NO	43	43
TOTAL	100	100

Table 5 Diabetes

DIABETES	FREQUENCY	PERCENT
YES	13	13
NO	87	87
TOTAL	100	100

Table 6 Hypertension

HYPERTENSION	FREQUENCY	PERCENT
YES	28	28
NO	72	72
TOTAL	100	100

Table 7 CIWA-Ar Score

CIWA-Ar SCORE GROUP	FREQUENCY	PERCENT
<10	14	14
11-15	17	17
16-20	11	11
>20	58	58
TOTAL	100	100

Table 8

SERUM_MAGNESIUM_GROUP		CIWA_AR_SCORE_GROUP *		Crosstabulation	
SERUM_MAGNESIUM_GROUP					
Total					<0.5
0.5-1.0	1.0-1.7	1.71 - 2.3			
CIWA_AR_SCORE			<10	Count	00
1	10	11	%	0.0%	
GROUP	0.0%	3.7%	50.0%	11.0%	
			8		
			10- 20	Count	0
0	22	9	31	%	0.0%
0.0%	81.5%	45.0%	31.0%		
			21- 30	Count	0
27	2	0	29	%	0.0%
67.5%	7.4%	0.0%	29.0%		
			31- 40	Count	1
7	1	0	9	%	7.7
% 17.5	% 3.7%	0.0%	9.0%		
			41- 50	Count	9
6	0	1	16	%	69.2
% 15.0	% 0.0	% 5.0	% 16.0		
			Above 50	Count	3
0	1	0	4	%	23.1
% 0.0	% 3.7	% 0.0	% 4.0%		
40	27	20	100	TotalCount	13
% 100.0	% 100.0	% 100.0	% 100.0%		% 100.0
Pearson Chi-Square=158.028** P<0.001					

DISCUSSION: In this cross sectional study, 100 patients with alcohol withdrawal syndrome were studied with respect to their CIWA-Ar score which determines the severity of symptoms

- Among the 100 patients, 21% belonged to 20 to 30year age group, 28%belonged to 31 to 40year age group, 27% in the 41- 50year age group, 18% in the 51- 60year age group and around 6% in the above 60year age group as noteD
- Among the patients observed, 66% of patients had a history of alcohol binge,34% patients had a previous history of alcohol intake for the past 5 to 10 yearsand 57% of patients also had a history of concomitant smoking in the past
- Among the selected 100 patients, 13% of the patients were found to be diabetics, while 28% were hypertensives
- The median CIWA- Ar score in this study group was 23. Around 56 patients with values above the median value of 23 had a mean serum magnesium levels of 0.7036 which is severe magnesium deficiency while 44 patients with a score less than 23 had a serum magnesium level of 1.65. the serum magnesium levels seem to correlate inversely with the CIWA Ar score, with patients with a score more than 20 had mean serum magnesium levels less than 0.7103.

Hence this establishes that hypomagnesemia has a direct relationship with the severity of symptoms among alcohol withdrawal syndrome patients

CONCLUSION

Magnesium deficiency is commonly found among chronic alcoholics with a prevalence of 90% noted It is essential to screen these patients for agnesium deficiency as the patients with higher CIWA-Ar score of above the median were observed to have severe magnesium deficiency.

Hypokalemia seems to be a confounding factor with hypokalemia causing hypomagnesemia.

Though serum sodium levels correlated inversely with the CIWA-Ar score,it was not significant enough to establish that hyponatremia could be a risk factor.

Serum urea did not correlate with the severity of symptoms among patients with alcohol withdrawal.

Duration of alcohol intake seems to be a risk factor while the abstinence period did not seem to affect the CIWA-Ar score

LIST OF ABBREVIATIONS:

- ACTH – Adrenocorticotrophic hormone
- ADH – Antidiuretic hormone
- AMPA – Alpha amino 3 hydroxy 5 methyl 4 isoxazolepropionic acid
- ANP – Atrial natriuretic peptide
- ARDS – Acute respiratory distress syndrome
- AUD – Alcohol use disorder
- CIWA-Ar – Clinical institute withdrawal assessment of alcohol scale, revised
- ECF – Extracellular fluid