ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 05 | May - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A STUDY OF RISK FACTORS OF DELIRIUM TREMENS IN PERSONS WITH ALCOHOL USE DISORDER IN A TERTIARY CARE HOSPITAL.

Psychiatry

Dr Rashmi Prakash — Assistant Professor, Department of Psychiatry. Hamdard Institute of medical sciences and research, New Delhi

Dr Dimple Gupta — Senior Resident, Department of Psychiatry. Hamdard Institute of medical sciences and research, New Delhi.

Dr Nimmi A Jose — Associate Professor & Head, Department of Psychiatry. Hamdard Institute of medical sciences and research, New Delhi

Dr Akansha Bhardwaj* — Senior Resident, Department of Psychiatry. Hamdard Institute of medical sciences and research, New Delhi *Corresponding Author

ABSTRACT

Introduction: Delirium tremens is the severe form of alcohol withdrawal state that carries a certain degree of mortality. It is important to understand various risk factors associated with delirium tremens and compare with persons in alcohol withdrawal without delirium tremens. Objectives of the Study is to identify various risk factors associated with delirium tremens and to compare and identify any differences in risk factors for withdrawal syndrome in persons with alcohol use disorder with and without delirium tremens. **Methodology:** This cross-sectional study was conducted in the Department of Psychiatry at Hamdard Institute of Medical Science and HAHC Hospital, New Delhi on the patients with alcohol use disorder in withdrawal attending Department of Psychiatry, during period from January 2022 to June 2022. 75 patients with alcohol use disorder were taken. They were further categorised into 3 groups of patients which included patients with alcohol use disorder experiencing uncomplicated withdrawal, complicated withdrawal with or without delirium tremens. Patients with age range 18-60 years of either sex with illness of at least 12 months were taken. Severity of withdrawal was assessed by CIWA-Ar (Clinical Institute for Withdrawal of Alcohol scale containing ten items). Data was analysed using computer-based software (SPSS v16). Mean scores were calculated for both study populations for all the scales applied. Chi square test was used to make in between group comparisons for categorical variables with P value less than 0.05 was considered statistically significant at 95 % confidence level. **Results:** Among the 75 patients admitted for detoxification treatment during the period of January 2022- June 2023; 9 of the participants were suffering from uncomplicated withdrawal, 13 participants were suffering from complicated withdrawal without delirium tremens and 53 participants was suffering from complicated withdrawal with delirium tremens The factors significantly associated with delirium tremens were previous history of DT (p=0.004**), binge drinking pattern (p=0.000**), history of morning alcohol consumption (p=0.000*), and delay in hospitalization (p=0.004**), and increased CIWA- AR score (p=0.001**). **Conclusion:** Patient admitted for detoxification should be carefully evaluated for these risk factors; and the vulnerable subjects with the presence of these risk factors should be cautiously managed and carefully monitored by the nurses taking care of these patients to prevent the occurrence of the fatal complication associated with alcohol withdrawal syndrome. Environmental manipulation, close observation and monitoring of vital signs, front loading dose of benzodiazepines are essential for preventing the occurrence of Delirium tremens during detoxification period.

KEYWORDS

Delirium tremens, risk factors, predictive factors, alcohol withdrawal syndrome, detoxification

INTRODUCTION

Delirium tremens (DT) is a severe form of alcohol withdrawal and is associated with high mortality rate. It is prevalent in approximately 5% to 24% of patients.(1–3) It is seen that, over the years, due to improved diagnostic and pharmacological measures mortality in such patients this rate has dropped from 35% to 2%.(4)

Although studies have identified risk factors for the occurrence of DT (5,6) the factors that determine a fatal outcome in such patients still remains unclear. Thus early recognition and intervention for the factors associated with DT can prevent lethal outcome. (2,7) Various risk factors have been found to be linked with the development of delirium tremens such as electrolyte abnormalities in the form of hypokalemia, hypophosphatemia, hypomagnesemia, high blood urea nitrogen, low nutritional state reflected by hypoalbuminemia, significantly raised levels of biological marker enzymes, such as gamma glutamyl transferase, alanine aminotransferase, and aspartate aminotransferase, raised MCV and carbohydrate deficient transferrin. (8,9) In some studies, low platelet count and the prevalence of structural brain lesions have also been found to be predictors for delirium tremens.(10,11)

In addition to this, many researchers have reported tachycardia at the time of admission, presence of infectious disease, alcohol related withdrawal signs along with an alcohol concentration of more than 1 gram per liter of body fluid, a history of epileptic seizures, and a past history of delirium as potential predictors for delirium tremens which can predict outcome for patients seeking acute treatment for alcohol withdrawal. (12) Individuals with early onset of heavy drinking of the age below 20 shows greater maladaptation in social settings, with greater severity and deterioration of alcoholism, and more frequency of withdrawal symptoms related with perceptual abnormalities, and delirium tremens.(13)A cohort study in patients with alcohol withdrawal studying the clinical, epidemiological, and biochemical variables reflective of alcohol consumption habits, basal health status and presentation features of syndrome reported that number of seizures, systolic blood pressure >150 mm Hg and axillary temperature >38 degrees C were important predictors for the development of delirium tremens were identified. (3)

In addition to this raised blood pressure, previous history of complicated alcohol withdrawal and medical comorbidity, alone and in combination, have been found to be associated with an increased risk of delirium tremens.(14) The purpose of the study was to identify important risk factors which can lead to development of DT in the patients who presented at the Psychiatry department of Hamdard Institute of Medical Science and HAHC Hospital, New Delhi

AIM

To study various risk factors associated with delirium tremens and compare with persons in alcohol withdrawal without delirium tremens.

OBJECTIVES

- To identify various risk factors associated with delirium tremens.
- To compare and identify any differences in risk factors for withdrawal syndrome in persons with alcohol use disorder with and without delirium tremens.
- To study the socio-demographic, clinical and biochemical profile of the persons with alcohol use disorder with and without delirium tremens.

MATERIALS AND METHODS

This cross-sectional study was conducted in the department of psychiatry at Hamdard Institute of Medical Science and HAHC Hospital, New Delhi on the patients with alcohol use disorder in withdrawal attending Department of Psychiatry, during period from

January 2022 to June 2022. 75 patients with alcohol use disorder were taken. They were further categorised into 3 groups of patients which included patients with alcohol use disorder experiencing uncomplicated withdrawal, complicated withdrawal with or without delirium tremens. Patients with age range 18-60 years of either sex with illness of at least 12 months were taken. They were diagnosed as per diagnostic criteria of alcohol Use Disorder according to Diagnostic and statistical manual 5 (DSM –5). Those refusing to give consent and dependent on substance other than nicotine, caffeine were excluded from the study. They were assessed for socio-demographic details, complete blood count, lipid profile, liver function test, kidney function test, serum random blood sugar, serum electrolytes. Severity of withdrawal was assessed by CIWA-AR (Clinical Institute for Withdrawal of Alcohol scale containing ten items with Maximum score: 67, Mild withdrawal <10. It is used routinely in clinical practice. Data was analysed using computer-based software (SPSS v16) with descriptive Statistics, used for the Socio-Demographic Variables. Mean scores were calculated for both study populations for all the scales applied. Chi square test was used to make in between group comparisons for categorical variables with P value less than 0.05 was considered statistically significant at 95 % confidence level.

Statistical Analysis

Data was analysed using computer-based software (SPSS v16) with descriptive Statistics used for the Socio-Demographic Variables. Mean scores were calculated for both study populations for all the scales applied. Continuous variables were summarized as means (M) and standard deviations (SDs). Categorical variables were presented as the frequency (%) for each variable. For categorical variables chi-square test or Fisher's exact test (χ 2) (where the frequency in a category was small) were used to find the association between the variables and the occurrence of DT. Continuous variables were compared using Student's t test (t) for independent samples and the Mann-Whitney test (U). The predictive factors for the occurrence of DT were analysed using binary logistic regression with odds ratio (OR) with 95% confidence intervals (CI). All significance tests were performed using a two-sided significance level of 5% ($p < 0.05$)

RESULTS

All the study participants were of male gender. The study participants were divided into three categories. 9 participants were suffering from uncomplicated withdrawal, 13 participants were suffering from complicated withdrawal without delirium tremens and 53 participants were suffering from complicated withdrawal with delirium tremens. Majority of the participants were educated till second standard (69.3%). Most of the participants were married (93.3%) and belonging to urban background (98.7%). The participants were equally distributed in lower middle and lower socioeconomic status (42.7% respectively), and only 2.6% were of upper socioeconomic status. Majority of the participants were having unskilled occupation (57.3%) while only one participant was working as a farmer in his own farm. Table 1)

Table 2 describes the association between the clinical profile of the participants and the alcohol withdrawal type suffered by the participants. With regard to the treatment taken in the past it was observed that the majority of patients who had not taken any treatment in the past were suffering from complicated withdrawal with delirium tremens (86.8%) and this was founf to be statistically significant (p value-0.001). 76.9% of the patients who suffered from complicated withdrawal without delirium tremens had not taken any treatment in the past. It was observed that majority of patients who suffered from delirium tremens (81.1%) were taking 1/2 to full bottle of alcohol daily. While 53.8% of patients suffering from complicated withdrawal without delirium tremens were taking 1/2 to full bottle of alcohol daily (p-value: 0.001).

With regard to similar episode in the past it was observed that majority of patients of delirium tremens (92.5%) had experienced a similar episode in the past. 69.2% of patients who experienced complicated withdrawal without delirium tremens had similar episode in the past (p-value: 0.001). Maximum patients of delirium tremens as well as complicated withdrawal without delirium tremens had had history of seizure in the past (94.3%). However, this value was not significant (p-value: 0.821). For the type of alcohol used it was seen that majority of patients ingesting Indian made alcohol experienced delirium tremens (77.4%) and complicated withdrawal (61.5%) and they had a significant value (p-value: 0.002). 66.7% of patient suffering from uncomplicated withdrawal were using country made liquor. It was observed that for patients who had suffered longer hours of withdrawal before hospitalization (majorly 3 hours) in 73.6% patients had suffered delirium tremens. P-value being 0.004. 94.3% of patients who had had past history of withdrawal other than delirium tremens had experience delirium tremens during this episode as well. 69.2% of patients who had experience past history of withdrawal other than delirium tremens had experienced complicated withdrawal without delirium tremens during this episode. P-value: 0.004. Patients who had history of morning drinking (90.6%) had support from delirium tremens during this episode while 69.2% of patients who had history of morning drinking suffered from complicated withdrawal without delirium tremens (p value:0). Patients who had a continuous heavy pattern of intake before admission in last one month (77.4%) had majorly suffered from delirium tremens as compared to those with episodic drinking pattern (p-value:0).

Although around 77% of patients who suffered from comorbid Medical or surgical illness suffer from delirium tremens and complicated withdrawal without delirium tremens respectively, these values did not come out to be significant p value:0.113. patients who had lesser number of previous attempts of abstinence in last one year (77.3%), suffered more from delirium tremens, however these values did not have any significance. Patients with comorbid neurological illness (90.6%) had majorly suffered from delirium tremens as compared to those who did not have neurological illness. While those who suffered from uncomplicated withdrawal all of them had a neurological illness and for 84.6% of those who suffered from complicated withdrawal without delirium tremens had neurological illness. But this did not show any significant value. (p value 0.475).

Table 3 shows the test of significance being used in order to compare between quantitative parameters with the alcohol withdrawal types. It was shown that patients of DT had mean length of hospitalisation of 10.3 days, without DT had mean of 9.6days and uncomplicated withdrawal had mean of 18.4 days. This came out to be significant (0).
In our study patients experiencing DT had a mean CIWA-ar score of 10.6, patience without delirium had a mean score 10.9 while patients having uncomplicated withdrawal had a mean CIWA-ar score of 14. This value came out to be significant (0.001).

With regard to pulse rate it was observed that patients experience in delirium tremens had a mean pulse rate of 87 beats per minute patients experience in complicated withdrawal without delirium tremens had a mean of 81 beats per minute while patients experience in complicated withdrawal had a mean pulse rate of 82 per minute and these values came out to be significant (0).

With regard to duration of benzodiazepine usage during hospitalization, patients who suffered from complicated withdrawal with delirium tremens during this episode had the shortest duration of benzodiazepine usage (mean= 6.7 days) as compared to the other groups (6.94 days complicated withdrawal without delirium tremens and 17.4 days for uncomplicated withdrawal) and the values for which came out to be significant (0).

Other parameters such as age, differences in respiratory rate haemoglobin values RBC count MCV, MCH, MCHC, TLC, serum electrolyte levels liver function tests as well as kidney function tests did not reveal any significant association with the alcohol withdrawal type in our study.

DISCUSSION

Many studies focus on severe alcohol withdrawal syndrome from the point of view of possible risk factors associated with the occurrence of delirium tremens. Patients suffering from delirium tremens are usually males in their mid-forties or fifties (15). In our study, Mean age of the patients with DT is 35.6±7.89. whereas in another study by Ferguson et al. the mean age is 41.9 years. The prevalence of delirium obtained in our study was 71 % among patients with Alcohol use Disorder, however in another study, the prevalence was found to be 54%. This study suggests low education(64%), those belonging lower socioeconomic status(94%),unskilled workers(57%) seemed to be at greatest risk factor for DT similar to study by Ferguson et al.(16)

A previous episode of delirium and/or seizures during withdrawal in the patient's history seems to be the greatest risk factor for the development of DT(17) similar to our study which shows previous

history of DT were found to be significantly related to the occurrence of DT i.e. majority of patients of delirium tremens (92.5%) had experienced a similar episode in the past. (p value:0.001) In our study it was found that amount of alcohol taken daily and continuous heavy pattern of drinking of drinking alcohol were found to be statistically significant similar to the previous studies.(15) Withdrawal seizures did not show statistical significance in our study similar to study by Chandini et al.(18)

Delay in hospitalization or longer hours of withdrawal before hospitalization were found to be significantly associated with the occurrence of DT (p=0.001**). Co-morbid medical illness were not found to be significantly associated with the occurrence of DT in the present study similar to the study by Renju et al.(15)

Previous episodes showed heavy episodes or binge drinking predict Delirium tremens (17) In our study 77.4% of patients had relatively higher level of alcohol consumption with continuous heavy intake of alcohol consumed since last month (p=0.00**)

Prevalence of structural brain lesions (90.6%) at the neurological examination, were not found to be statistically significant in our study however in another study it is considered as a higher risk for the development of DT (19).

Mean CIWA-ar Score > 10 were found to be a strong predictor of delirium tremens in our study similar to study by Kristin et al where CIWA-Ar score greater than or equal to 10 was found to be the predictor of Delirium tremens.(20)

With regard to duration of benzodiazepine usage during hospitalization, patients who suffered from complicated withdrawal with delirium tremens during this episode had the shortest duration of benzodiazepine usage. In another study, we found that baseline treatments, including use of benzodiazepines, did not differ among those who had gone more days since their last drink.

This finding suggests that baseline differences might be present, were not recognized or were underappreciated by admitting physicians, in view of lack of detailed history, heavy patient load and poor compliance. This further emphasizes the need for psychoeducation among the family members which would ensure recognition of severity by busy admitting physicians.

Previous studies showed significantly elevated bilirubin levels, SGOT levels, Elevated blood glucose levels, high respiratory rate and elevated systolic blood pressure have been noted to be predictors of delirium tremens. Our study did not support any difference in the physical parameters of three groups. Serum electrolytes, haemoglobin, WBC counts, and platelets did not differ statistically in the two groups similar to the previous studies.(11,16,19)

CONCLUSION

Our study is an important step in developing risk- assessment of delirium tremens; we have shown that in this cohort of inpatients, simple clinical factors correlated with risk of developing delirium tremens.

These results are preliminary and need further prospective development and validation, particularly in different populations and settings. When fully developed, such models will help clinicians identify patients at high risk of severe alcohol withdrawal events and will guide specific interventions to reduce or prevent fatal complications.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for their clinical information to be reported in journal/publication. The patient understands that her name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil

Conflicts of interest

There are no conflicts of interest.

Table 1

		alcohol withdrawal type			Total
		uncomplicated withdrawal	complicated withdrawal with delirium tremens	complicated withdrawal without delirium tremens	
Sex	male	9	53	13	75
Total		9	53	13	75
Education (in years)	0	0	1	0	1
	1	2	3	0	5
	2	4	34	8	46
	3	0	3	0	3
	5	2	1	2	5
	6	0	2	1	3
	8	0	2	0	2
	10	1	0	0	1
	12	0	4	2	6
	PG	0	3	0	3
Total		9	53	13	75
Marital status	unmarried	2	1	2	5
	married	7	52	11	70
Total		9	53	13	75
type of family	Nuclear	8	44	9	61
	Joint	1	9	4	14
Total		9	53	13	75
Background	urban	9	52	13	74
	rural	0	1	0	1
Total		9	53	13	75
SES	upper	0	2	0	2
	upper middle	1	1	1	3
	lower middle	5	21	6	32
	upper lower	2	2	2	6
	lower	1	27	4	32
Total		9	53	13	75
Occupation	professional	0	4	1	5
	clerk;shop owner;farm owner	0	1	0	1
	skilled work	0	5	1	6
	semi skilled	4	11	2	17
	unskilled	5	30	8	43
	unemployed	0	2	1	3
Total		9	53	13	75

Table 2

		alcohol withdrawal type			Total	Pearson Chi-Square	Likelihood Ratio
						Asymp. Sig. (2-sided)	
		uncomplicated withdrawal	complicated withdrawal with delirium tremens	complicated withdrawal without delirium tremens			Asymp. Sig. (2-sided)
type of onset of illness	acute	0	1	1	2		
	gradual	9	52	12	73	0.441	0.479
Total	9	53	13	75			

PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr

course	continuous	9	51	11	71	0.186	0.219
	episodic	0	2	2	4		
Total		9	53	13	75		
treatment taken in past	No	3	46	10	59	0.001	. 004
	Yes	6	7	3	16		
Total		9	53	13	75		
Daily amount of use	quarter	0	6	2	8	0.001	0.016
	quarter to half	1	4	4	9		
	half to full	6	43	7	56		
	more than 1	2	0	0	2		
Total		9	53	13	75		
Morning drinking	No	9	5	4	18	0	0
	Yes	0	48	9	57		
Total		9	53	13	75		
Similar episode in past	No	5	4	4	13	0.001	0.002
	Yes	4	49	9	62		
Total		9	53	13	75		
History of seizure	No	1	3	1	5	0.821	0.838
	Yes	8	50	12	70		
Total		9	53	13	75		
Since last drink, comorbid medical or surgical illness	No	5	12	3	20	0.113	0.144
	Yes	4	41	10	55		
Total		9	53	13	75		
Type of alcohol	Indian	3	45	8	56	0.002	0.004
	country	6	5	4	15		
	Wine	0	3	1	4		
Total		9	53	13	75		
Previous attempts of abstinence in 1 year	Never	1	4	3	8	0.009	0.021
	Once	2	41	7	50		
	Twice	6	7	3	16		
	Thrice	0	1	0	1		
Total		9	53	13	75		
Delay in hospitalization or longer hours of withdrawal before hospitalization	1	4	5	3	12	0.004	0.007
	2	3	9	5	17		
	3	2	39	4	45		
	6	0	0	1	1		
Total		9	53	13	75		
comorbid medical or surgical illness	Yes	4	4	2	10	0.01	0.03
	No	5	49	11	65		
Total		9	53	13	75		
Pattern of intake before admission in last 1month	continuous	1	41	6	48	0	0
	episodic	8	12	7	27		
Total		9	53	13	75		
Neurological illness	No	0	5	2	7	0.475	0.326
	Yes	9	48	11	68		
Total		9	53	13	75		
Previous history of delirium tremens	No	2	2	1	5	0.12	0.21
	Yes	7	51	12	70		
Total		9	53	13	75		
Previous history of withdrawal other than delirium tremens	Yes	5	50	9	64	0.004	0.007
	No	4	2	4	10		
	3	0	1	0	1		
Total		9	53	13	75		
Mode of giving benzodiazepine IV/IM/ORAL	Sublingual	6	1	2	9	0	0
	Oral Tab	3	6	1	10		
	IM	0	7	6	13		
	IV	0	39	4	43		
Total		9	53	13	75		
Antipsychotic use during hospital ization	Yes	1	1	1	3	0.323	0.379
	No	8	52	12	72		
	Total	9	53	13	75		

Table 3

			Sum of Square	df	Mean Square	F	Sig.
Age * alcohol withdrawal type	Between Groups	(Combined)	137.717	2	68.858	1.107	.336
	Within Groups		4478.283	72	62.198		
	Total		4616.000	74			.000
Length of hospitalization * alcohol withdrawal type	Between Groups	(Combined)	547.611	2	273.806	35.555	
	Within Groups		554.469	72	7.701		
	Total		1102.080	74			
CIWA-ar score * alcohol withdrawal type	Between Groups	(Combined)	84.200	2	42.100	7.963	.001
	Within Groups		380.680	72	5.287		
	Total		464.880	74			
Weight * alcohol withdrawal type	Between Groups	(Combined)	587.870	2	293.935	5.686	.005
	Within Groups		3722.077	72	51.696		
	Total		4309.947	74			
Height * alcohol withdrawal type	Between Groups	(Combined)	22.284	2	11.142	.365	.696
	Within Groups		2199.103	72	30.543		
	Total		2221.387	74			
Respiratory rate * alcohol withdrawal type	Between Groups	(Combined)	3.661	2	1.830	.815	.447
	Within Groups		161.726	72	2.246		
	Total		165.387	74			
Pulse rate: * alcohol withdrawal type	Between Groups	(Combined)	659.999	2	329.999	9.239	.000
	Within Groups		2571.788	72	35.719		
	Total		3231.787	74			
Hb * alcohol withdrawal type	Between Groups	(Combined)	3.178	2	1.589	.783	.461
	Within Groups		146.167	72	2.030		
	Total		149.345	74			
RBC count * alcohol withdrawal type	Between Groups	(Combined)	.095	2	.047	.179	.836
	Within Groups		18.962	72	.263		
	Total		19.057	74			
MCV * alcohol withdrawal type	Between Groups	(Combined)	20.819	2	10.409	.104	.901
	Within Groups		7202.107	72	100.029		
	Total	7222.926	74				
MCH * alcohol withdrawal type	Between Groups	(Combined)	17.996	2	8.998	.190	.828
	Within Groups		3416.163	72	47.447		
	Total		3434.159	74			
MCHC * alcohol withdrawal type	Between Groups	(Combined)	8.140	2	4.070	.868	.424
	Within Groups		337.482	72	4.687		
	Total		345.622	74			
TLC * alcohol withdrawal type	Between Groups	(Combined)	6190865.215	2	3095432.608	.557	.575
	Within Groups		400071001.451	72	5556541.687		
	Total		406261866.667	74			
Serum potassium level * alcohol withdrawal type	Between Groups	(Combined)	1.165	2	.582	3.222	.046
	Within Groups		13.015	72	.181		
	Total		14.180	74			
Serum sodium level * alcohol withdrawal type	Between Groups	(Combined)	68.649	2	34.325	2.645	.078
	Within Groups		934.337	72	12.977		
	Total		1002.987	74			

Liver enzymes (ALT), (AST) (GGT) * alcohol withdrawal type	Between Groups	(Combined)	7086.622	2	3543.311	.630	.535
	Within Groups		404837.698	72	5622.746		
	Total		411924.320	74			
AST * alcohol withdrawal type	Between Groups	(Combined)	511.017	2	255.509	.034	.967
	Within Groups		540301.463	72	7504.187		
	Total		540812.480	74			
GGT * alcohol withdrawal type	Between Groups	(Combined)	488.938	2	244.469	.071	.932
	Within Groups		249345.062	72	3463.126		
	Total		249834.000	74			
Serum bilirubin levels * alcohol withdrawal type	Between Groups	(Combined)	1.215	2	.607	1.034	.361
	Within Groups		42.309	72	.588		
	Total	43.523	74				
Serum urea levels * alcohol withdrawal type	Between Groups	(Combined)	60.144	2	30.072	.852	.431
	Within Groups		2540.736	72	35.288		
	Total		2600.880	74			
Serum creatinine levels * alcohol withdrawal type	Between Groups	(Combined)	.011	2	.006	.440	.646
	Within Groups		.929	72	.013		
	Total		.940	74			
Structural imaging findings if any * alcohol withdrawal type	Between Groups	(Combined)	1.921	2	.960	1.177	.314
	Within Groups		58.746	72	.816		
	Total	60.667	74				
Duration of alcohol use * alcohol withdrawal type	Between Groups	(Combined)	8.552	2	4.276	.159	.853
	Within Groups		1932.194	72	26.836		
	Total	1940.747	74				
Daily amount of use * alcohol withdrawal type	Between Groups	(Combined)	2.811	2	1.406	3.054	.053
	Within Groups		33.136	72	.460		
	Total		35.947	74			
Delay in hospitalization or longer hours of withdrawal before hospitalization * alcohol withdrawal type	Between Groups	(Combined)	5.926	2	2.963	4.369	.016
	Within Groups		48.821	72	.678		
	Total		54.747	74			
Length of hospitalization * alcohol withdrawal type	Between Groups	(Combined)	547.611	2	273.806	35.555	.000
	Within Groups		554.469	72	7.701		
	Total		1102.080	74			
Duration of benzodiazepine use during hospitalization * alcohol withdrawal type	Between Groups	(Combined)	907.277	2	453.639	53.311	.000
	Within Groups		612.669	72	8.509		
	Total		1519.947	74			
Amount of benzodiazepine use during hospitalization * alcohol withdrawal type	Between Groups	(Combined)	179.932	2	89.966	3.262	.044
	Within Groups		1986.015	72	27.584		
	Total		2165.947	74			
Days since last drink * alcohol withdrawal type	Between Groups	(Combined)	1.468	2	.734	.043	.958
	Within Groups		1238.878	72	17.207		
	Total		1240.347	74			

REFERENCES

1. Wright T, Myrick H, Henderson S, Peters H, Malcolm R. Risk factors for delirium tremens: A retrospective chart review. Am J Addict 2006;15:213-9.
2. Khan A, Levy P, Dehorn S, Miller W, Compton S: Predictors of mortality in patients with delirium tremens. AcadEmerg Med 2008, 15:788–790. -
3. Monte R, Rabuñal R, Casariego E, Bal M, Pértega S: Risk factors for delirium tremens in patients with alcohol withdrawal syndrome in a hospital setting. Eur J Int Med 2009, 20:690–694
4. Hersh D, Kranzler HR, Meyer RE: Persistent delirium following cessation of heavy alcohol consumption: diagnostic and treatment implications. Am J Psychiatry 1997, 154:846–851.
5. Rawlani V, Vekaria S, Eisenberg S: Treatment of the hospitalized alcohol- dependent patient with alcohol withdrawal syndrome. The Internet J Int Med 2009, 8
6. Bayard M, Mcintyre J, Hill KR, Woodside J Jr: Alcohol withdrawal syndrome.Am Fam Physician 2004, 69:1443–1450. - Google Search [Internet].
7. Ignjatovic Ristic D, Obradovic Z, Markovic A, Lazarevic J: DeliriumTremens-Faktori od znacaja za mortalitet [abstract]. Med Cas 2007, 41:39.
8. Combining the audit questionnaire and biochemical markers to assess alcohol use and risk of alcohol withdrawal in medical inpatients
9. Sharpe PC. Biochemical detection and monitoring of alcohol abuse an abstinence. Ann Clin Biochem 2001;38:652-64.
10. Berggren U, Fahlke C, Berglund KJ, Blennow K, Zetterberg H, Balldin J. Thrombocytopenia in early alcohol withdrawal isassociated with development of delirium tremens or seizures. Alcohol Alcohol 2009;44:382-6.
11. Eyer F, Schuster T, Felgenhauer N, Pfab R, Strubel T, Saugel B, et al. Risk assessment of moderate to severe alcohol withdrawal--predictors for seizures and delirium tremens in the course of withdrawal. Alcohol Alcohol Oxf Oxfs. 2011;46(4):427–33.
12. Palmstierna T. A model for predicting alcohol withdrawal delirium. Psychiatr Serv Wash DC. 2001 Jun;52(6):820–3.
13. DeWit DJ, Adlaf EM, Offord DR, Ogborne AC. Age at first alcohol use: a risk factor for the development of alcohol disorders. Am J Psychiatry. 2000 May;157(5):745–50.
14. Fiellin DA, O'Connor PG, Holmboe ES, Horwitz RI. Risk forDelirium Tremens in Patients with Alcohol Withdrawal Syndrome.Subst Abus 2002;23:83-94.
15. Gmaj P, Hoppe A, Angielski S, Rogulski J, Metler M. Effects of maleate on renal reabsorption of bicarbonate. Curr Probl Clin Biochem. 1975;4:101–5.
16. Ferguson JA, Suelzer CJ, Eckert GJ, Zhou XH, Dittus RS. Risk factors for delirium tremens development. J Gen Intern Med. 1996 Jul; 11(7):410-4. - Go
17. Lee SH, Jang MK, Lee JY. Clinical predictors for delirium in alcohol dependence. J Gastroenterol Hepatol 2005; 20:1833-37. - Google Search [Internet].
18. Chandini S, Sequeira AZ, Mathai PJ. Factors associated with delirium tremens: A retrospective chart study. Muller J Med Sci Res 2013;4:86-9 - Google Search .
19. Wetterling T, Kanitz RD, Veltrup C, Driessen M. Clinical predictors of alcohol withdrawal delirium. Alcohol Clin Exp Res. 1994 Oct;18(5):1100–2.
20. Salottolo K, McGuire E, Mains CW, van Doorn EC, Bar-Or D. Occurrence, Predictors, and Prognosis of Alcohol Withdrawal Syndrome and Delirium Tremens Following Traumatic Injury. Crit Care Med. 2017 May;45(5):867–74.