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# TO ANALYZE THE SOCIO-DEMOGRAPHIC VARIABLES AMONG THE ALCOHOL WITHDRAWAL PATIENTS WITH AND WITHOUT DELIRIUM TREMENS

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## Abstract

Alcohol is a direct cause of several acute and chronic diseases as classified under the International Classification of Diseases (ICD-10), and it contributes to the development of numerous other conditions, including various cancers, cardiovascular issues, liver disorders, gastrointestinal diseases, and neuropsychiatric conditions. Therefore, this study seeks to examine the socio-demographic differences between patients experiencing delirium tremens and those who do not, within the population undergoing alcohol withdrawal.

A prospective, cross-sectional observational study was carried out to assess the prevalence of delirium tremens (DT) among 300 patients diagnosed with alcohol withdrawal syndrome. These patients were admitted to the Department of Psychiatry and De-addiction Center, based on alcohol withdrawal criteria outlined in the ICD-10.

A statistically significant difference was observed between alcohol withdrawal patients with delirium tremens and those without across several socio-demographic variables. These included mean age, religion, occupation, type of family, household income, duration of alcohol dependence, mean age at the onset of dependence, reasons for initiating alcohol use, average daily alcohol consumption, distribution based on quantity consumed per day, and the type of alcohol consumed, all showing significance at $p< 0.0001$. Additionally, the age at first alcohol use and the mean age of first drink were also significantly different between the groups, with $p<0.005$.

In this study, certain socio-demographic factors were associated with an increased risk of developing delirium tremens (DT). These included being male and aged 44 years or older. Individuals who began drinking at an early age, consumed larger quantities of alcohol, and had a longer history of alcohol dependence were more likely to experience DT compared to those without the condition.

**Key Words**: Delirium Tremens, Alcohol withdrawal, De-addiction, Socio-demographic

## INTRODUCTION

Alcohol consumption is responsible for approximately 5.1% of the global burden of disease and contributes to nearly 3.3 million deaths each year.[1] A national survey conducted in 2019 by the National Drug Dependence Treatment Centre (NDDTC) at the All India Institute of Medical Sciences (AIIMS), New Delhi, explored the prevalence and patterns of substance use across India.[2] The findings revealed that around 14.6% of the population aged 10 to 75 years equating to roughly 160 million individuals consume alcohol. Among them, 5.7 crore (5.2%) are classified as problem users, and 2.9 crore (2.7%) meet the criteria for alcohol dependence. Alcohol use is significantly more prevalent among men (27.3%) compared to women (1.6%). Alcohol misuse remains a widespread public health issue, exerting an increasingly harmful impact on global populations. The World Development Report estimates that alcohol-related problems account for about 2% of the global disease burden and affect 5–10% of the world's population annually. The most notable increases in alcohol

consumption over recent decades have occurred in developing countries, particularly in regions where alcohol use was traditionally lower and where access to prevention, control, and treatment services remains limited.[3]

Alcohol is directly associated with a range of acute and chronic health conditions recognized under the International Classification of Diseases (ICD-10). It also plays a contributory role in the development of numerous illnesses, including various types of cancer, cardiovascular disorders, liver and digestive diseases, as well as neuropsychiatric conditions.[4,5]Alcohol Withdrawal Syndrome (AWS) occurs when an individual who has been consuming alcohol over a prolonged period suddenly reduces or stops intake. This syndrome is marked by a range of symptoms linked to autonomic hyperactivity, such as agitation, tremors, irritability, anxiety, heightened reflexes, confusion, elevated blood pressure, increased heart rate, fever, and excessive sweating. AWS generally begins within 6 to 24 hours after a significant reduction in alcohol consumption in individuals with alcohol dependence. The condition can be life-threatening and varies in intensity. Mild to moderate cases may present with symptoms like tremors, nausea, anxiety, and low mood, while severe cases may progress to delirium tremens, hallucinations, and intense depressive episodes.[6]

Delirium is one of the most severe complications associated with alcoholism, affecting approximately 5–20% of individuals undergoing alcohol withdrawal. Delirium tremens (DT) is particularly concerning due to its high morbidity and mortality rates. It is characterized as a transient but potentially life-threatening confusional state, often accompanied by various physical disturbances. DT typically occurs in individuals with a long history of heavy alcohol use and usually arises following either complete or partial cessation of alcohol intake.The reasons why some individuals are more prone to developing severe withdrawal symptoms remain unclear. However, research has identified several socio-demographic and alcohol use-related factors that may increase susceptibility. Previous studies have consistently linked prior episodes of delirium, elevated heart rate, high blood pressure, low platelet count, and other physiological markers as persistent risk factors for DT.

In light of these findings, this study aims to examine the socio-demographic differences between patients with and without delirium tremens among those experiencing alcohol withdrawals.

## METHODOLOGY

A prospective, cross-sectional observational study was conducted at the Department of Psychiatry and De-addiction Center, J.L.N. Medical College, Ajmer. A total of 300 patients diagnosed with alcohol withdrawal syndrome were enrolled in the study after applying defined inclusion and exclusion criteria. These patients were admitted for the management of alcohol withdrawal. The diagnosis was made based on the ICD-10 criteria for mental and behavioral disorders and confirmed independently by two psychiatrists from the department who were not involved in the study.

Upon obtaining written informed consent, participants were assessed using a semi-structured demographic data form on the first day of enrollment. Based on the presence or absence of delirium tremens (DT), participants were categorized into two study groups. Various clinical and socio-demographic parameters were compared between the two groups. In the DT group, repeated assessments were conducted at short intervals throughout the delirium episode.

The data collected were analyzed using appropriate statistical methods with SPSS (Statistical Package for the Social Sciences), version 22.0 (IBM Inc.). The Chi-square test was employed for comparing categorical variables such as age, sex, ASA grade, and VAS scores. For continuous variables between the two groups, the unpaired Student's t-test was used. Results were expressed as mean ± standard deviation. A p-value greater than 0.05 was considered statistically not significant, while a p-value less than 0.05 was deemed statistically significant.

## RESULTS

After collecting socio-demographic data, all variables were examined for outliers and non-normal distributions. Data were presented as means with standard deviations, and descriptive statistics were used to evaluate baseline characteristics.

The mean age of participants in the alcohol dependence (AD) group without delirium tremens (DT) was 36.86 years, while in the AD group with DT, it was 44.59 years. This age difference was statistically highly significant ($p< 0.0001$). Gender distribution in the AD without DT group included 241 males (88.93%) and 30 females (11.07%), whereas the AD with DT group had 26 males (89.66%) and 3 females (10.34%). The difference was not statistically significant ($p = 0.9056$).

In terms of religion, 261 patients (96.31%) in the AD without DT group were Hindu and 10 (3.69%) were Muslim. In contrast, 23 (79.31%) in the DT group were Hindu, and 6 (20.69%) were Muslim, a difference that was statistically significant ($p = 0.0001$). Regarding the place of residence, 180 patients (66.42%) in the AD without DT group were from rural areas and 91 (33.58%) from urban areas. In the AD with DT group, 20 (68.96%) were rural and 9 (31.04%) urban. This difference was not significant ($p = 0.7823$).

Education levels in the AD without DT group included 10 (3.69%) illiterate, 100 (36.90%) with middle school education, 50 (18.45%) primary, 40 (14.76%) senior secondary, 30 (11.07%) secondary, and 41 (15.13%) graduates. In the AD with DT group, 1 (3.45%) was illiterate, 15 (51.72%) had middle school education, 2 (6.90%) primary, 1 (3.45%) senior secondary, 3 (10.34%) secondary, and 7 (24.14%) graduates. This difference was not statistically significant ($p = 0.1981$).

Marital status analysis showed that 213 patients (78.60%) in the AD without DT group were married and 58 (21.40%) unmarried. In the DT group, 21 (71.41%) were married and 8 (27.59%) unmarried, a difference that was not statistically

significant ($p$ = 0.5973). Occupational status revealed significant differences ($p$< 0.0001), with 106 (39.11%) skilled, 15 (5.54%) semi-skilled, and 150 (55.35%) unskilled individuals in the AD without DT group, compared to 10 (34.48%) skilled, 9 (31.04%) semi-skilled, and 10 (34.48%) unskilled in the DT group.

Family structure analysis showed that in the AD without DT group, 134 (49.45%) were from joint families, 17 (6.27%) from extended nuclear families, and 116 (42.80%) from nuclear families. In contrast, in the DT group, 21 (72.41%) belonged to joint families, 8 (27.59%) to extended nuclear families, and none to nuclear families. This difference was statistically significant ($p$< 0.0001). Family income levels, ranging from less than ₹10,000 to more than ₹51,000, also differed significantly between the two groups ($p$< 0.0001).

The age at first alcohol use ranged between under 20 to 40 years, with the difference being statistically significant ($p$ = 0.0067). The mean age of first drink was 21.13 years in the AD without DT group and 18.38 years in the DT group ($p$ = 0.0358). Duration of alcohol dependence ranged from less than 5 years to 25 years, and the mean duration was 8.97 years in the AD without DT group compared to 13.48 years in the DT group ($p$< 0.0001), indicating a significant difference.

Reasons for initiating alcohol use varied: in the AD without DT group, 40 (14.76%) cited stress, 13 (4.78%) family history, 7 (2.58%) family issues, 191 (70.48%) peer pressure, and 20 (7.38%) relationship issues. In the DT group, reasons included stress (3, 10.34%), family history (2, 6.90%), family issues (7, 24.14%), and peer pressure (17, 58.62%), with none citing relationship issues. This difference was statistically significant ($p$< 0.0001).

The average daily alcohol consumption was 24.08 units in the AD without DT group and 38.62 units in the DT group, a highly significant difference ($p$< 0.0001). Daily consumption categories ranged from less than 20 units to over 50 units, with a significant distribution difference ($p$< 0.0001). Type of alcohol consumption also showed a significant difference ($p$< 0.0001): country-made liquor (CML) was consumed by 180 (66.42%) in the AD without DT group and 15 (51.72%) in the DT group; Indian-made foreign liquor (IMFL) by 71 (26.20%) and 4 (13.79%) respectively; and a mixed type by 20 (7.38%) and 10 (34.49%).

Regarding the time since the last drink, 251 (92.62%) in the AD without DT group and all 29 (100%) in the DT group reported drinking within the past 24 hours. Twenty individuals (7.38%) in the AD without DT group reported drinking two days prior. This difference was not statistically significant ($p$ = 0.1300).

**Table 1: Socio-demographic Data**

| | | **Group AD without DT N=271** | **Group AD with DT N=29** | **P value** | **T value** |
|---|---|---|---|---|---|
| **Age (Mean±SD) in years** | | 36.86±5.97 | 44.59±5.12 | <0.0001(s) | 6.711 with df=298 |
| **Gender** | **Male** | 241(88.93%) | 26(89.66%) | 0.9056(NS) | 0.01408with df=1 |
| | **Female** | 30(11.07%) | 3(10.34%) | | |
| **Religion** | **Hindu** | 261(96.31%) | 23(79.31%) | 0.0001 (S) | 14.994with df=1 |
| | **Muslim** | 10(3.69%) | 6(20.69%) | | |
| **Domicile** | **Rural** | 180(66.42%) | 20(68.96%) | 0.7823(NS) | 0.076 with df=1 |
| | **Urban** | 91(33.58%) | 9(31.04%) | | |
| **Education** | **Illiterate** | 10(3.69%) | 1(3.45%) | 0.1981 (NS) | 7.317 with df=5 |
| | **Middle** | 100(36.90%) | 15(51.72%) | | |
| | **Primary** | 50(18.45%) | 2(6.90%) | | |
| | **S. Secondary** | 40(14.76%) | 1(3.45%) | | |
| | **Secondary** | 30(11.07%) | 3(10.34% | | |
| | **Graduation** | 41(15.13%) | 7(24.14%) | | |
| **Marital Status** | **Married** | 213(78.60%) | 21(71.41%) | 0.5973 (NS) | 0.2790with df=1 |
| | **Unmarried** | 58(21.40%) | 8(27.59%) | | |
| **Occupation** | **Skilled** | 106(39.11%) | 10(34.48%) | <0.0001(s) | 23.576with df=2 |
| | **Semiskilled** | 15(5.54%) | 9(31.04%) | | |
| | **Unskilled** | 150(55.35%) | 10(34.48%) | | |
| **Family type** | **Joint** | 134(49.45%) | 21(72.41%) | <0.0001(s) | 29.012with df=2 |
| | **Nuclear Extended** | 17(6.27%) | 8(27.59%) | | |
| | **Nuclear** | 116(42.80%) | 0 | | |

| | | | | | |
|---|---|---|---|---|---|
| **Family Income** | **<10k** | 110(40.59%) | 9(31.03%) | <0.0001(S) | 34.14 with df=4 |
| | **11k-20k** | 81(29.89%) | 12(41.38%) | | |
| | **21k-30k** | 60(22.14%) | 0 | | |
| | **31k-40k** | 0 | 0 | | |
| | **41k-50k** | 10(3.69%) | 8(27.59%) | | |
| | **>51k** | 10(3.69%) | 0 | | |
| **Age of First Drink** | **<20 years** | 162(59.78%) | 26(89.66%) | 0.0067 (S) | 9.999 with df=2 |
| | **21-30 years** | 76(28.04%) | 2(6.90%) | | |
| | **31-40 years** | 33(12.18%) | 1(3.45%) | | |
| **Age of First Drink (Mean±SD) in years** | **Mean** | 21.13 | 18.38 | 0.0358(S) | 2.109 with df=298 |
| | **Standard deviation** | 6.87 | 4.34 | | |
| **Number of years of dependence pattern** | **<5 years** | 60(22.14%) | 0 | <0.0001 (S) | 103.42with df=4 |
| | **6-10years** | 110(40.59%) | 14(14.28%) | | |
| | **11-15years** | 90(33.21%) | 4(13.79%) | | |
| | **16-20years** | 1(0.37%) | 11(37.93%) | | |
| | **21-25years** | 10(3.69%) | 0 | | |
| **Number of years of Dependence pattern (Mean±SD) in years** | **Mean** | 8.97 | 13.48 | <0.0001 (S) | 5.009with df=298 |
| | **Standard deviation** | 4.52 | 5.39 | | |
| **Reason for starting alcohol** | **Due to stress** | 40(14.76%) | 3(10.34%) | <0.0001 (S) | 29.34 with df=4 |
| | **Family History** | 13(4.78%) | 2(6.90%) | | |
| | **Family Issue** | 7(2.58%) | 7(24.14%) | | |
| | **Peer Pressure** | 191(70.48%) | 17(58.62%) | | |
| | **Relationship Issue** | 20(7.38%) | 0 | | |
| **Amount of Alcohol per Day (units)** | **Mean** | 24.08 | 38.62 | <0.0001(HS) | 9.305 with df=298 |
| | **Standard deviation** | 7.97 | 8.26 | | |
| **Amount of Alcohol per Day (Units)** | **<20 units** | 95(35.06%) | 0 | <0.0001(S) | 105.60with df=3 |
| | **21-30units** | 133(49.08%) | 4(13.79%) | | |
| | **31-40units** | 36(13.28%) | 11(37.93%) | | |
| | **41-50units** | 7(2.58%) | 14(48.28%) | | |
| **Type of Alcohol** | **Cml** | 180(66.42%) | 15(51.72%) | <0.0001(S) | 21.726with df=2 |
| | **Imfl** | 71(26.20%) | 4(13.79%) | | |
| | **Mixed** | 20(7.38%) | 10(34.49%) | | |
| **Duration of last drink From the day of Interview** | **<1 Day before** | 251(92.62%) | 29(100%) | 0.1300 (NS) | 2.293 with df=1 |
| | **2 Days before** | 20(7.38%) | 0 | | |

**Students t-test applied; S=Significant; NS=Non-significant; df=degree of freedom**

**DISCUSSION**

In this cross-sectional observational study, 300 consecutive in-patients diagnosed with alcohol withdrawal syndrome (AWS) according to ICD-10 criteria were included. The primary objective was to assess the prevalence of delirium tremens (DT) among hospitalized patients with alcohol withdrawal and to compare the socio-demographic and clinical characteristics between patients with and without DT. Out of the total 300 participants, 29 developed DT, indicating a DT prevalence rate of 9.6%. This figure closely aligns with the findings of Sorensen et al[11] who reported a DT prevalence of 10.8% in their longitudinal research. Conversely, other Indian studies have shown higher rates Paudayal et al[12] for instance, reported a DT prevalence of 24.13%. Such discrepancies may stem from methodological variations. Globally, DT prevalence ranges between 0.6% and 15%.[13]

When comparing socio-demographic and clinical profiles between the two groups, the mean age in the non-DT group was 36.86 years, whereas it was significantly higher at 44.59 years in the DT group. These findings are consistent with Monte et al[14] and supported by Paudayal et al[12] who observed that 80% of DT cases occurred in individuals over 50 years of age. A strong male predominance exceeding 85% was evident in both groups, reflecting the higher rates of alcohol consumption among men in India.

**Table 2: Comparison of Socio-demographic variables**

| **Variable** | **Current study N=300** | | **Paudyal et al 2020[12] N=396** | | **Monte 2009[14] N=303** | |
|---|---|---|---|---|---|---|
| | **With DT N=29** | **Without DT N=271** | **With DT N=71** | **Without DT N=325** | **With DT N=147** | **Without DT N=156** |
| **Age in years** | 44.59 | 36.86 | >50 36(80%) | 26(81.2%) 29-39 years | 45.3 (12.1) | 46.3 (12.9) |
| **Gender** | 26(89.66%) Male 3(10.34%) female | 241 (88.93%) male 30 (11.07%) female | Male 64(52.5%) Female 7(35.0%) | Male58(47.8%) Female 13(65.0%) | 128 (87%) | 139 (89.1%) |
| **Religion** | Hindu 23(79.31)% | Hindu 261 (96.31%) | 65(50.4%) Hindu | 64(49.6%) Hindu | | |
| **Marital status** | 21(71.41%) Married | 213 (78.60%) Married | 53(50.5%) Married | 52(49.5%) married | | |
| **Occupation** | 10 (34.48%) unskilled 10 (34.48%) skilled | 150 (55.35%) unskilled | 31(58.5%) Labourer | 22(41.5%) Labourer | | |
| **Domicile** | 20(68.96%) Rural 9(31.04%) Urban | 180 (66.42%) Rural 91 (33.58%) Urban | Data not available | | | |
| **Education wise** | 15(51.72%) Middle school | 100 (36.90%) Middle school | 11(73.3%) Illiterate | 28(70.0%) Can read and write | | |
| **Type of family** | 21(72.41%) Joint family | 134 (49.45%) Joint family | 43(58.1%) nuclear | 38(61.3%) Joint | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Family income** | 12 (41.38%) 11k -20k | 110 (40.59%) <10k | | | | |

Occupational status showed a statistically significant difference: patients with DT were equally divided between skilled and unskilled professions, while the non-DT group predominantly comprised skilled workers. Although lower literacy levels were common across both groups, there was no significant difference in education level, with middle school education being the most frequent.

A higher proportion of DT patients came from joint families compared to the non-DT group. This may be related to family-related stress, which was a commonly cited reason for alcohol use among this group. Additionally, individuals with DT tended to have higher family incomes than those without DT. A longer duration of alcohol dependence was also more prevalent among DT patients.

Country-made liquor (CML) was the most commonly consumed form of alcohol in both groups. However, nearly 48% of DT patients reported consuming 41–50 units of alcohol daily, significantly higher than the non-DT group. The timing of the last drink prior to hospital admission did not differ significantly between the groups. Importantly, a prior history of withdrawal seizures was notably more frequent in the DT group, showing a highly significant association.

## CONCLUSION

In this study, certain socio-demographic factors were found to elevate the risk of developing delirium tremens (DT). These include male gender and age 44 years or older. Individuals who began consuming alcohol at an early age, those with a longer duration of alcohol dependence, and those who consumed larger quantities of alcohol were more likely to experience DT compared to those without DT.


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