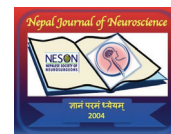# Association Between Alcohol Dependence and Depressive Episode: Before and After Treatment of the Dependence

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Abstract

Introduction: Alcoholism, also known as alcohol use disorder (AUD), is a broad term for any drinking of alcohol that results in mental or physical health problems like anxiety, dependence and depression. This study was conducted with aim to determine association between alcohol dependence and depressive episode before and after treatment for alcohol dependence.

Methods and Materials: An observational study was conducted among all diagnosed alcohol dependent and depressed adult patients attending to Psychiatry OPD of a Medical College in Kolkata for a period of one year. Baseline assessment was done during first visit with a semi structured questionnaire for socio-demographic profile and using AUDIT, CIWA and HAM-D 17 scale for their mental status and further assessments on day 14, day 30, after 2 months using same scales. Relationship between depression with alcohol dependence were determined by Pearson corelation test and presented with tabular form and scatter plot. Changes in mean score of different scales before and after treatment was assessed by paired t test considering confidence interval (CI) of 95% and p value ≤ 0.05 as significant.

Result: Out of 70 patients, almost 90% of them were below the age 45 years with male preponderance (94.3%). Paired t test result showed, association of mean scores of different scales, before and after treatment of dependence was statistically significant (p=0.00). Mean AUDIT score, mean CIWA score and mean HAM score for the patients were found to be decreased with advancement of treatment. Pearson correlation test revealed, moderate relationship between AUDIT score and HAMD17 score (0.522) and strong relationship between AUDIT score and CIWA score (0.789).

Conclusion: If alcohol dependence is treated properly there will be automatically decreased prevalence of alcohol withdrawal and alcohol induced depressive episodes.

Key words: Alcohol Dependence, Depression, Withdrawal

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Introduction

Alcoholism may cause various degree of mental or physical health problems .[1] The interactions between anxiety or depression and alcohol use are complex.[2-4] While alcohol use may be used as coping mechanisms by people with mental health problems, this can also worsen or trigger anxiety or depression. [5-6] Alcohol use is quite common around the world and in the Indian society. Consequently, it results in widespread losses in the form of injuries to physical and mental health. Prevalence rates of alcohol use disorder in India vary between 23 to 74%.[7] The prevalence of co-morbidity of depression and alcohol use disorder has been demonstrated in various researches.[8-9] The causal effect of alcohol use disorder leading to depression implies that some cases of depression resolve after treatment of alcohol dependence.[10-11] The present study was conducted with an aim to determine the

association between alcohol dependence and depressive episode before and after treatment for alcohol dependence.

Methods and Materials

An institution-based observational study with cross-sectional design was conducted among all diagnosed alcohol dependent and depressed patients aged more than 18 years, attending to Psychiatry out patient department of R.G Kar Medical College & Hospital, Kolkata for a period of one year (from July 2020- June 2021), excluding patients with any other psychiatric disorder (e.g. anxiety disorder, obsessive compulsive disorder, bipolar disorder, psychosis etc.), history of any other substance use disorder, associated with any significant medical co-morbidity and exposure to any therapy with psychotropic drugs in last 6 months. Diagnosis of alcohol dependence was confirmed by Mini International Neuropsychiatric Interview (MINI 6.0) [12] and International Classification of Disease (ICD-10) criteria. [13] There was total 84 patients who had come to the Psychiatry OPD during the study period and diagnosed as confirmed case of alcohol dependence and alcohol induced or withdrawal depression. But due to loss to follow up during subsequent visits and incompleteness of data, finally the researcher could analyse the findings of 70 patients.

The study was initiated after getting approval from the Institutional Ethics Committee of RG Kar Medical College, Kolkata. Data regarding socio-demographic characteristics was collected by interview of the participants using a pretested schedule. Prior informed consent was obtained from the study subjects and their anonymity and confidentiality was maintained. Data related to alcohol dependence, alcohol induced depression and withdrawal were assessed using following scales: Alcohol Use Disorder Identification Test (AUDIT) scale for alcohol dependence [14], Clinical Institute Withdrawal Assessment (CIWA) scale for alcohol withdrawal[15] and Hamilton Depression Rating Scale (HAM-D17) for assessing depression [16] had been used in the present study. AUDIT score more than 8 was considered as positive for alcohol dependence and HAM-D 17 scale score more than 14 was considered as positive for depressed. Whereas CIWA score 10 or more was considered as positive for withdrawal. Initial assessment of the patients was done on day 0 (pre-treatment assessment) with a semi structured questionnaire for socio-demographic profile and using AUDIT, CIWA and HAM-D 17 scale for their mental status at first visit. Further assessments were done in between day 14 to day 16, next in between day 30 to day 35 and final assessment was done after 2 months using same scales to measure the changes of different components of HAMD-17 scale over time. Though the duration of alcohol induced depression vary widely, but generally this have shown to improve significantly after abstained from alcohol typically 3-4 weeks in many cases.

Collected data were checked for consistency and completeness and entered in excel data sheet built by Microsoft Corporation. Further analysis was done with the help of software IBM SPSS for Windows, version 22, Armonk, NY: IBM Corporation. Data were organized and presented using the using the principles of descriptive statistics. Relationship between depression and withdrawal with alcohol dependence were determined by Pearson corelation test and represented in the form of table and scatter plot. Changes in mean score of different scales for assessing depression/withdrawal and dependence before and after treatment of dependence was assessed by doing paired t rest considering confidence interval (CI) of 95% and p value ≤ 0.05 as significant

Ethical approval: This study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patient's verbal and analytical approval before sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a "Institutional Ethics Committee", RG Kar Medical College, Kolkata, according to the document number IEC/RKC/2019-20/77 dated 20.01.2020 to get this approval.

Result

Out of total 70 patients, majority of them were in between the age group of 30 to 45 years (60%), followed by patients aged below 30 years (31.4%). Males constituted 94.3% of the total study subjects in the present study. Majority of the subjects used to consume mixed type of alcohol (40%), followed by country liquor (38.6%) and 21.4% of them used to consume foreign liquor (Table 1). Mean AUDIT score for the patients decreased with advancement of treatment. Mean score was found to be 17.13 at day 0, 9.7 at day 14, 8.8 at 1 month and finally 7.94 at 2 months (Table 2 & Figure 1). Mean CIWA score for the patients was also found to be decreased with advancement of treatment. Mean score decreased significantly from 11.94 at day 0, 2.27 at day 14, 0.89 at 1 month and finally 0.29 at 2 months (Table 2). There was marked decrease in mean HAMD-17 score among the patients with advancement of treatment of alcohol dependence. Mean score was found to be decreased from 19.34 at day 0, 9.63 at day 14, 7.94 at 1 month and finally 7.2 at 2 months (Table 2 & Figure 2).

Paired t test result which was done to see the association of mean scores of AUDIT scale, CIWA scale and HAMD-17 scales before and after treatment of dependence among the patients, revealed that, there was high statistically significant association (p=0.00) before and after treatment groups (Table 3).

Another interesting finding of the present study was, when detailed analysis of different components of HAMD-17 scale was done, it was observed that, there was marked decrease in mean value related to anxiety, insomnia, depressed mood, feeling of guilt, suicidal thoughts etc. from day 0 to day 60, whereas, mean values for some components had changed very little even after 2 months of treatment, like- retardation, somatic symptoms, activities, agitation etc. (Figure 3).

Further statistical analysis to find out correlation between different parameters, revealed that, R^2 Linear value between AUDIT score and HAMD-17 score was 0.272, meaning 27.2% variation in the HAMD-17 score could be explained by AUDIT score and there was moderate relationship between these two scores (Pearson correlation value 0.522), which was found to be statistically significant (Figure 4). Similarly, R^2 Linear value between AUDIT score and CIWA score was 0.623, meaning 62.3% variation in the CIWA score could be explained by AUDIT score and there was strong relationship between these two scores (Pearson correlation value 0.789), which was found to be statistically significant (Figure 5).

Table 1: Background characteristics of the study participants (n=70)

Parameters	Frequency	Percentage
Age group		
< 30 years	22	31.4
30-45 years	42	60
> 45 years	6	8.6
Gender		
Male	66	94.3
Female	4	5.7
Literacy status		
Illiterate	9	12.9
Literate	61	87.1
Type of alcohol consumed		
Country	27	38.6
Foreign	15	21.4
Mixed	28	40
Total	**70**	**100**

Table 2: Changes in Mean and SD values of AUDIT score, CIWA score and HAMD17 score from day 0 to day 60 (n=70)

Days	AUDIT score	CIWA score	HAM score
Day 0	17.1±5.2	11.9±7.9	19.3±4.6
Day 14	9.7±3.3	2.3±0.9	9.6±4.4
Day 30	8.8±2.7	0.9±2.3	7.9±4.3
Day 60	7.9±2.1	0.3±1.2	7.2±3.9

Table 3: Paired t test results showing changes in mean score of different scales before and after treatment of dependence (n=70)

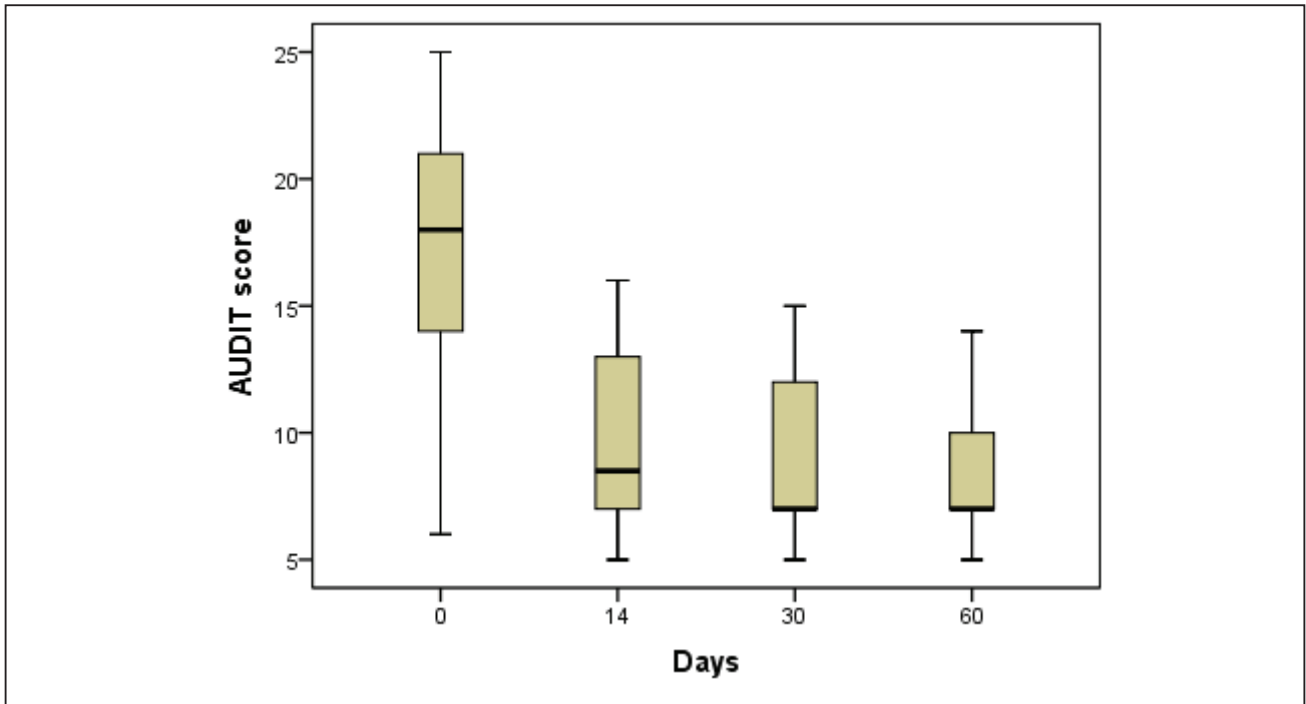| Parameters	Day 0	Day 60	Statistical test of significance
AUDIT score	17.1±5.2	7.9±2.1	Paired t test value= 13.6 95% CI= 7.85 to 10.52 P value= 0.000*
CIWA score	11.9±7.9	0.3±1.2	Paired t test value= 12.11 95% CI= 9.75 to 13.56 P value= 0.000*
HAMD17 score	19.3±4.6	7.2±3.9	Paired t test value= 16.81 95% CI= 10.71 to 13.57 P value= 0.000*

Figure 1: Box and whisker plot showing mean values and inter quartile range (IQR) for AUDIT score with advancement of treatment
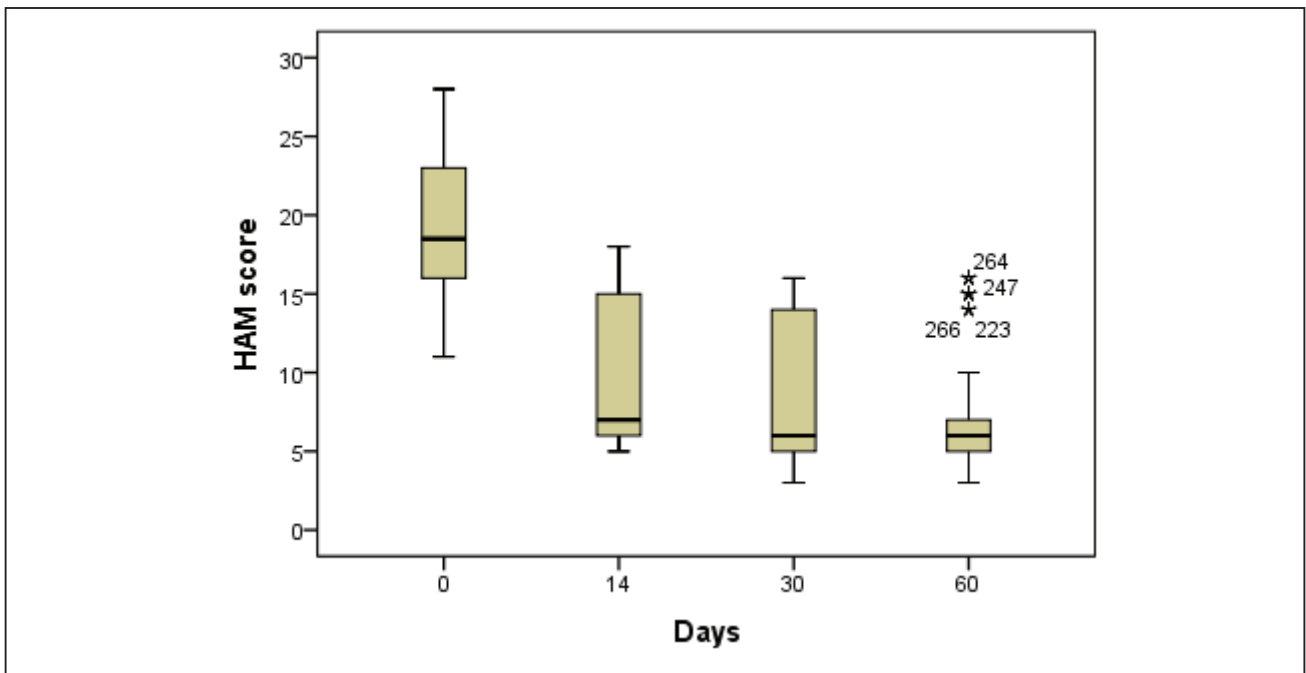

Figure 2: Box and whisker plot showing mean values and IQR for HAM score with advancement of treatment
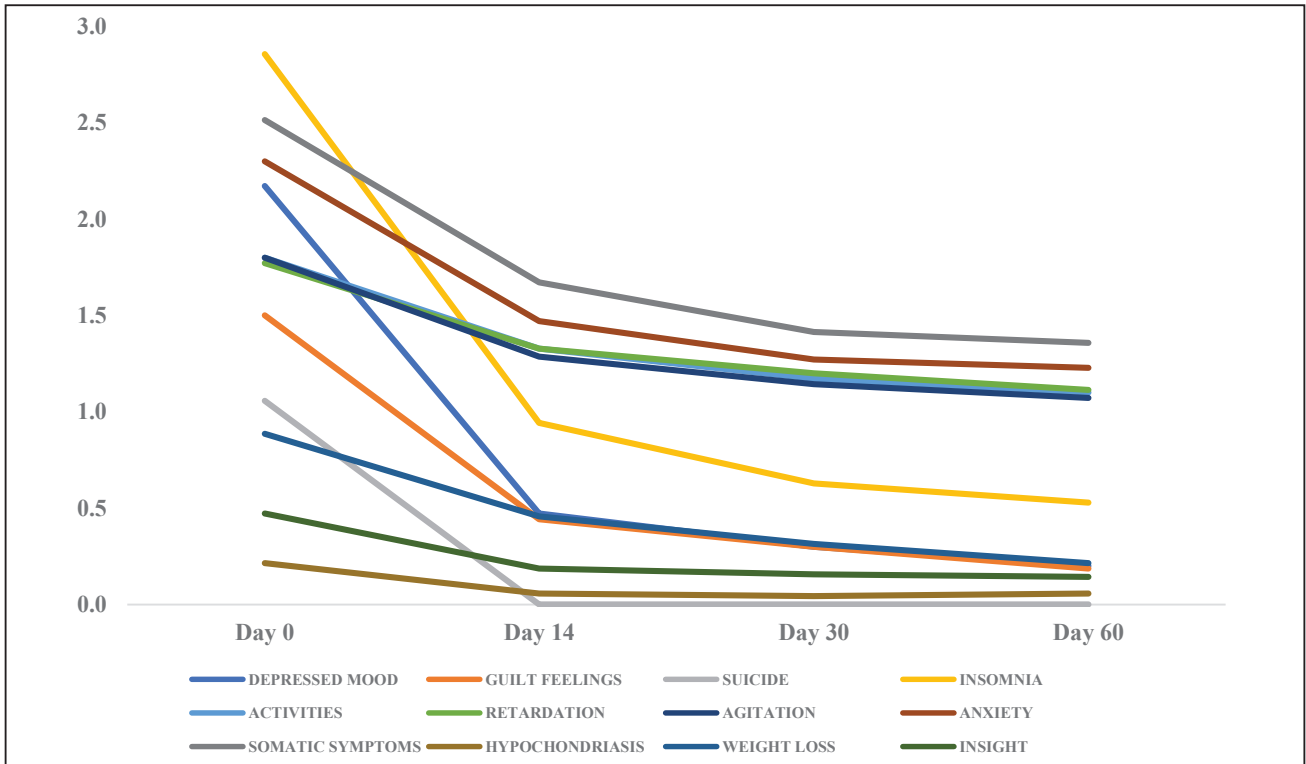
Figure 3: *Changes in some of the important parameters of HAMD17 scale over time*
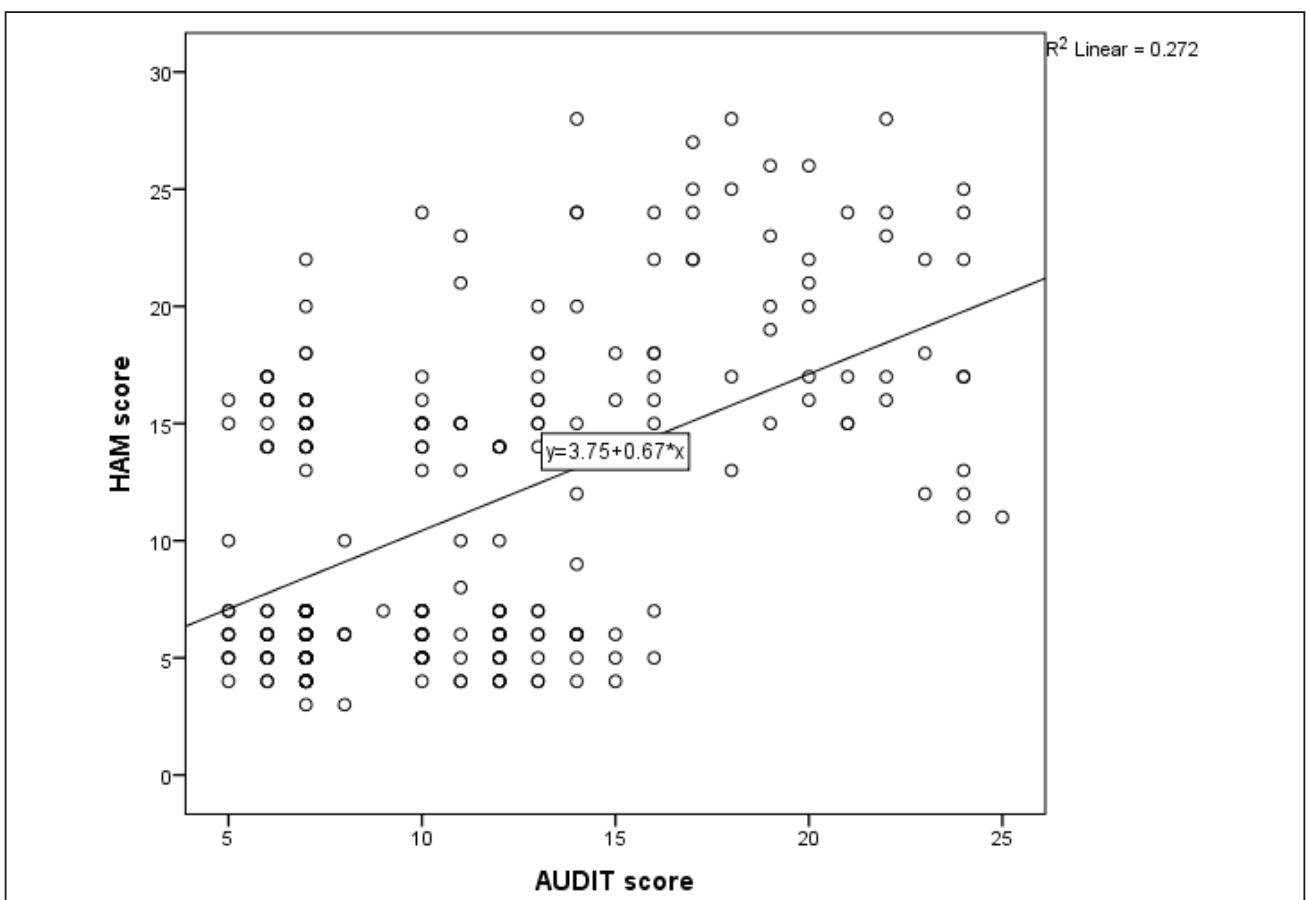

Figure 4: *Scatter plot showing corelation between AUDIT score and HAMD17 score*
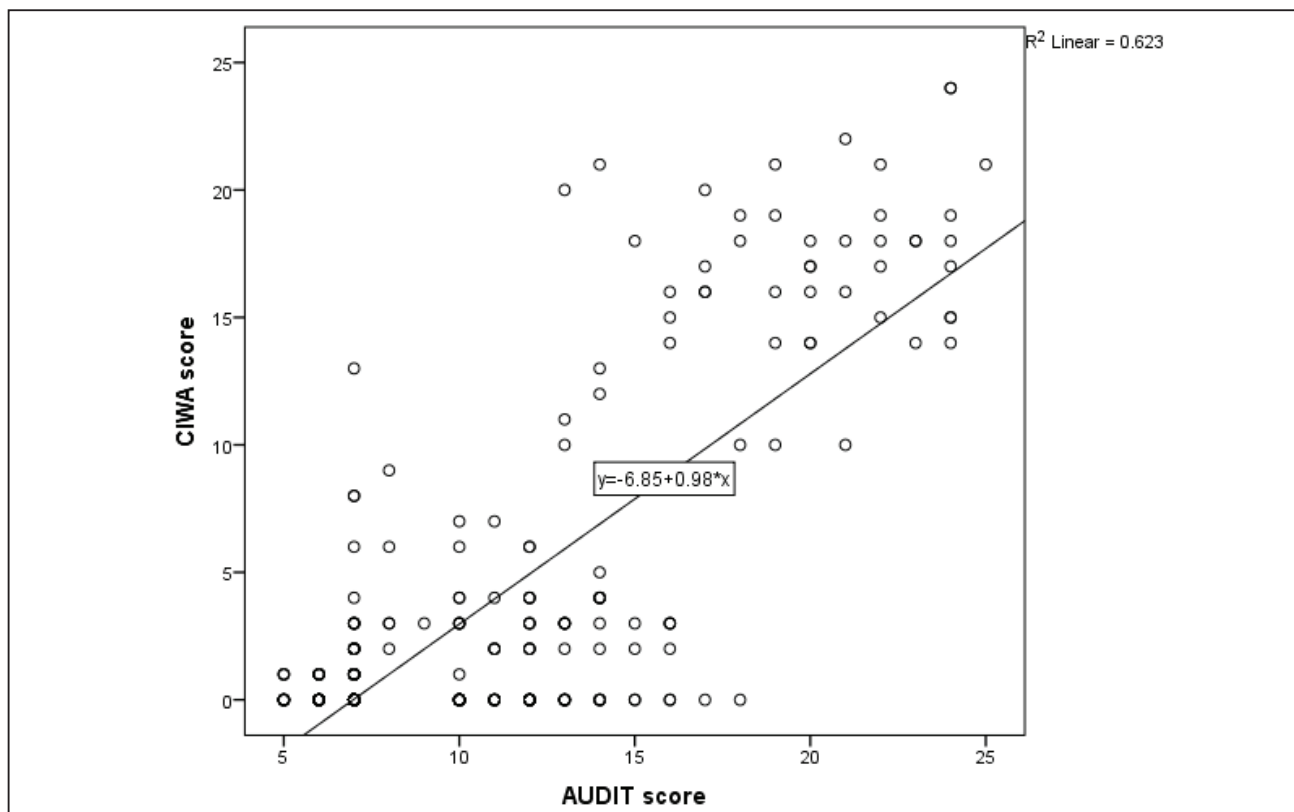
Figure 5: Scatter plot showing corelation between AUDIT score and CIWA score

Discussion

The present study was conducted among 70 patients diagnosed having alcohol dependence with an aim to find out the association between alcohol dependence and depressive episode and also improvement of depression with the treatment of dependence. Almost 90% of the patients were below the age 45 years with male preponderance (94.3%). Similar findings were shown by Kuria MW et al [18], where they had recorded that, out of total 188 participants who underwent community-based detoxification, majority (91.5%) were middle aged male and 8.5% were female.

It was observed that, mean AUDIT score and mean CIWA score of the patients was decreased with advancement of treatment. Most importantly, it was noted that, there was marked decrease in mean HAMD 17 score among the patients with advancement of treatment of alcohol dependence. Kuria MW et al [18] in their study had shown that, there was statistically significant reduction in prevalence of depression at intake before detoxification was 63.8%. Six months after detoxification and completion of rehabilitation the prevalence of depression was 30.2%.

Findings of Pearson correlation test revealed that, there was moderate relationship between AUDIT score and HAMD17 score and strong relationship between AUDIT score and CIWA score. Kuria MW et al [18] in their study had shown that, there was statistically significant

association between depression and the level of alcohol dependence at intake. Participants with higher AUDIT score were more likely to be depressed.

Reduction in the incidence of alcohol withdrawal and alcohol induced depression needs proper management of alcohol dependence. In this context, considering the salient features and major conclusions of the present study following recommendations may be made, such as: assessment of alcohol induced dependence, withdrawal and depression should be done using standard tools among all patients attending psychiatry OPD during their first visit. In case of high-risk patient, they should be monitored closely for development of complications. Early detection and treatment of complications should be done for favourable outcome.

Conclusion

Based on the findings and interpretation of the present study as presented and discussed above following conclusions can be drawn: mean AUDIT score, mean CIWA score and mean HAM score for the patients were found to be decreased with advancement of treatment. So, it can be concluded that, if alcohol dependence is treated properly there will be automatically decreased prevalence of alcohol withdrawal and alcohol induced depressive episodes.

Limitations

Though it was the researcher's sincere effort to find out the association between depression and dependence among alcoholic patients with advancement of their treatment but some limitations could not be ruled out. Some of the clinical profile of the patients was based on the past records and history of past medical illnesses; this might have led to information bias. Recall bias during interview for some variables could not be avoided.

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