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ORIGINAL RESEARCH

A clinical study of gamma glutamyl transferase (GGT) and psychiatric comorbidity in association with alcohol use disorder patients

Dr. Ambar Tiwari[1], Dr Ashish Kumar Gupta[2], Suruchi Gupta[3]

[1]Assistant Professor, Department of Psychiatry, Muzaffarnagar Medical College, Muzaffarnagar, UP, India.
[2]Associate Professor, Department of Psychiatry, Narayan Medical College and Hospital, Rohtas, Bihar, India
[3]Assistant Professor, Department of Community Medicine, Maharshi Devraha Baba Autonomous State Medical College, Deoria, UP, India

Corresponding Author
Dr. Ambar Tiwari
Assistant Professor, Department of Psychiatry, Muzaffarnagar Medical College, Muzaffarnagar, UP, India

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ABSTRACT

Background: Excessive and prolonged alcohol consumption can result in the development of dependence, which is characterized by a withdrawal syndrome upon the cessation or significant reduction of alcohol intake. Hence; the present study was conducted for assessing gamma glutamyl transferase (GGT) and psychiatric comorbidity in association with alcohol dependent patients. **Materials & methods:** The A cohort of 100 male individuals, aged between 18 and 60 years, who met the diagnostic criteria for alcohol dependence as outlined in the International Classification of Diseases, 10th Edition (ICD-10) for research purposes (World Health Organization, 1993), was selected for this study. Individuals with a history of any systemic illnesses or known drug allergies were excluded from participation. Each participant underwent a structured clinical interview to confirm the diagnosis of alcohol dependence, in addition to completing the Alcohol Use Disorder Identification Test (AUDIT) to assess their alcohol consumption patterns. Furthermore, blood samples were collected, and both electrocardiograms (ECG) and ultrasonograms were performed. The data were analyzed using SPSS software, with the Chi-square test employed to determine the significance of the findings. **Results:** Psychiatric co-morbidity was seen in 83 percent of the patients. Anxious avoidant, Nicotine dependence, Anxiety disorder, Depression and Schizophrenia was seen in 18.07 percent, 12.05 percent, 25.3 percent, 22.89 percent and 9.64 percent of the patients respectively. Mean GGT levels among patients with and without psychiatric co-morbidity was 1195 U/L and 69.2 U/L respectively. significant results were obtained while comparing GGT levels among patients with and without psychiatric co-morbidity. **Conclusion:** The Gamma-glutamyl transferase (GGT) level can play a crucial role in the accurate identification of Alcohol use disorder patients with psychiatric comorbidity thereby facilitating the equitable management of related cases. It offers valuable motivational support to affected individuals.

Key words: Gamma glutamyl transferase, Psychiatric co-morbidity

INTRODUCTION

Alcohol abuse/dependence represents a serious health issue. The average alcoholic decreases his or her life span by 10 to 15 years [1,2]. ADS has been associated prominently with liver disease and thyroid dysfunction. Alcoholic liver disease is usually accompanied by hepatitis, cirrhosis and/or hepatocellular cancer [3-5] The severity of alcohol induced liver damage varied among different individuals and requires one or more additional factors to affect the liver [6]. Excessive and prolonged alcohol consumption can result in the development of dependence, which is characterized by a withdrawal syndrome upon the cessation or significant reduction of alcohol intake. This syndrome encompasses both physical manifestations and psychological symptoms that can lead to considerable distress and discomfort. For certain individuals, the apprehension regarding withdrawal symptoms may serve to sustain alcohol misuse; additionally, the experience of these symptoms can facilitate relapse following periods of sobriety. Research on withdrawal and relapse has been conducted in both human subjects and animal models of alcoholism.[7, 8] Clinical investigations have

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revealed that individuals with alcohol dependence exhibit heightened sensitivity to cues and stimuli that can trigger relapse, a finding that has been corroborated in animal studies focusing on alcohol dependence, withdrawal, and relapse. One contributing factor to relapse is the anxiety associated with withdrawal, which likely indicates neuroadaptive changes in the brain resulting from chronic alcohol exposure. These alterations can impact various physiological systems, including the body's stress response mechanisms.[9,10]

Psychiatric comorbidity rates in alcohol-dependent persons range from 100% in psychiatric in-patient settingsto 47% in community samples. Regardless of whether alcohol use and other psychiatric illness are primary or secondary or independent of each other, they become extensively intertwined over time.[11] Gamma-glutamyltransferase (GGT) is a well-established serum marker for alcohol-related liver disease. However, GGT's predictive utility applies well beyond liver disease: elevated GGT is linked to increased risk to a multitude of diseases and conditions, including cardiovascular disease, diabetes, metabolic syndrome (MetS), and all-cause mortality.12, 13[6, 7] Hence; the present study was conducted for assessing gamma glutamyl transferase (GGT) and psychiatric comorbidity in association with alcohol dependent patients.

MATERIALS & METHODS

The present study was conducted in tertiary care centre for assessing gamma glutamyl transferase (GGT) and psychiatric comorbidity in association with alcohol dependent patients. A cohort of 100 male individuals, aged between 18 and 60 years, who met the diagnostic criteria for alcohol dependence as outlined in the International Classification of Diseases, 10th Edition (ICD-10) for research purposes (World Health Organization, 1993), was selected for this study. Individuals with a history of any systemic illnesses or known drug allergies were excluded from participation. Each participant underwent a structured clinical interview to confirm the diagnosis of alcohol dependence, in addition to completing the Alcohol Use Disorder Identification Test (AUDIT) to assess their alcohol consumption patterns. Furthermore, blood samples were collected, and both electrocardiograms (ECG) and ultrasonograms were performed. The data were analyzed using SPSS software, with the Chi-square test employed to determine the significance of the findings.

RESULTS

A total of 100 subjects were enrolled. Mean age of the patients was 49.2 years. Majority proportion of patients were males. Psychiatric co-morbidity was seen in 83 percent of the patients. Anxious avoidant, Nicotine dependence, Anxiety disorder, Depression and Schizophrenia was seen in 18.07 percent, 12.05 percent, 25.3 percent, 22.89 percent and 9.64 percent of the patients respectively.Mean GGT levels among patients with and without psychiatric co-morbidity was 1195 U/L and 69.2 U/L respectively. significant results were obtained while comparing GGT levels among patients with and without psychiatric co-morbidity.

Table 1: Prevalence of psychiatric co-morbidity

Psychiatric co-morbidity	Number	Percentage
Present	83	83
Absent	17	17
Total	100	100

Graph 1: Spectrum of psychiatric co-morbidity

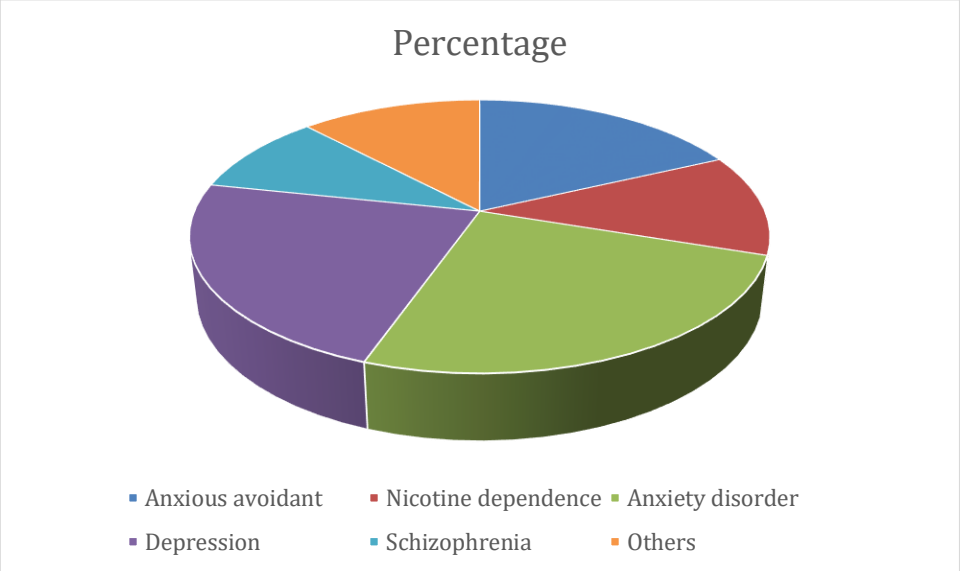

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Table 2: Correlation of psychiatric co-morbidity and GGT (U/L)

GGT	Psychiatric co-morbidity present	Psychiatric co-morbidity absent
Mean	119.5	69.2
SD	33.9	12.5
p-value	0.0012 (Significant)	

DISCUSSION

Alcoholism is a significant public health concern that carries substantial socioeconomic implications. Individuals within the military are not exempt from the challenges posed by alcohol use disorders. This issue accounts for approximately 15-20% of all psychiatric hospitalizations and is a contributing factor in numerous medical, surgical, and traumatic emergencies. Various patterns of alcohol consumption are associated with a range of health, occupational, and social issues that adversely affect the quality of life for those affected.[12-,15]Hence; the present study was conducted for assessing gamma glutamyl transferase (GGT) and psychiatric comorbidity in association with alcohol dependent patients.

A total of 100 subjects were enrolled. Mean age of the patients was 49.2 years. Majority proportion of patients were males. Psychiatric co-morbidity was seen in 83 percent of the patients. Anxious avoidant, Nicotine dependence, Anxiety disorder, Depression and Schizophrenia was seen in 18.07 percent, 12.05 percent, 25.3 percent, 22.89 percent and 9.64 percent of the patients respectively. Mean GGT levels among patients with and without psychiatric co-morbidity was 1195 U/L and 69.2 U/L respectively. significant results were obtained while comparing GGT levels among patients with and without psychiatric co-morbidity.R Jaisingh et al [16] examined the prevalence and pattern of psychiatric disorders in alcohol dependence (ADS) and their relationship with physical and laboratory findings. Hundred males admitted in a tertiary care medical college with ADS were examined using International Classification of Disease-10th Edition, Alcohol Use Disorder Identification Test for alcohol use, blood sampling electrocardiogram, and ultrasonogram of abdomen. Eighty percent had a comorbid Axis I or an Axis II psychiatric disorder, over 75% had nicotine dependence, and 50% had comorbid Axis II disorder, antisocial personality being the most common. Gamma glutamyl transferase (GGT) levels were raised and were significantly associated with comorbidity. High comorbidity of Axis I psychiatric disorders was found among persons with alcohol dependence. Axis II disorders were also present. GGT levels were elevated in most of patients and there was a significant association with psychiatric comorbidity.[17] Gauba D et al examined the prevalence and pattern of comorbidity in alcohol dependence and its relationship with physical and laboratory findings. Eighty-seven percent had a comorbid Axis I or an Axis II psychiatric disorder, over 78% had nicotine dependence, and 56% had comorbid Axis II disorder, antisocial personality being the most common. Gamma glutamyl transpeptidase levels were significantly associated with comorbidity.High comorbidity of Axis I psychiatric disorders was found among persons with alcohol dependence. Axis II disorders were also present.[18]Dixit S et al assessed fifty two consecutive cases of alcohol dependence syndrome which admitted to a peripheral hospital were evaluated for the biological marker gamma glutamyl transferase (GGT) and compared them against the gold standard of psychiatrist assessment. At cutoff level of 50 IU/lit GGT exhibited specificity of 100% and sensitivity varying from 56% to 100%. At lower cut off levels chances of false positive cases with adverse consequences on service prospects of the individuals are high. The mean difference in GGT levels across relapse and abstinent group reached significant statistical proportion at admission and during follow-up at 3 months /6 months/9 months and 12 months.

CONCLUSION

The Gamma-glutamyl transferase (GGT) level can play a crucial role in the accurate identification of alcohol use disorder with comorbidity, thereby facilitating the equitable management of related cases. It offers valuable motivational support to affected individuals.

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