ORIGINAL RESEARCH

Association of liver function enzymes among chronic alcoholic liver patients in central India

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ABSTRACT

Introduction: The term "alcoholic liver disease" refers to the hepatic consequences of drinking too much alcohol, including fatty liver, alcoholic hepatitis, and chronic hepatitis with cirrhosis or hepatic fibrosis. Alcoholism causes cirrhosis in a number of nations, including India, and alcoholic liver disease is one of the top 10 fatalities worldwide.

Methodology: The present study was conducted at the Department of Biochemistry, Index Medical College Hospital and Research Centre, Indore. After ethical clearance and informed consent, patients aged 30-60 years of chronic alcoholic disease patients diagnosed on the basis of WHO norms.

Result: The Index Medical College Hospital and Research Centre, Indore, included 62 adult subjects in its outpatient department (OPD). Out of the total patients, 54 patients were male and patients were female in terms of sex. The patients were placed into four groups according to their ages, which ranged from 30 to 60. Patients of both sexes between the ages of 35 and 40 have the highest frequency of ALD.

Conclusion: We advocated screening for alcohol consumption in all adult patients presenting to the hospital as early detection of ALD could decrease morbidity and mortality related to ALD. Monitoring GGT, AST, and ALT in combination is a sensitive technique of determining severity of alcohol induced liver damage.

Key words:ALD, AST, GGT

INTRODUCTION

The term "alcoholic liver disease" refers to the hepatic consequences of drinking too much alcohol, including fatty liver, alcoholic hepatitis and chronic hepatitis with cirrhosis or hepatic fibrosis [1].

Alcoholism causes cirrhosis in a number of nations, including India, and alcoholic liver disease is one of the top 10 fatalities worldwide. Alcohol use has been steadily increasing in India over the past ten years as a result of socioeconomic status. Frequently and excessively consuming alcohol is one of the key factors that damage the liver [2, 3].

According to the global burden of illness project, alcohol is thought to be the cause of 3.5% of people who are disabled and 1.5% of all fatalities [4].

The amount and frequency of alcohol drinking are the main risk factors for the onset of alcoholic liver disease. Women are more likely to incur liver damage of the same severity when they consume 20 to 40 grammes of alcohol per day compared to men, who must consume more than 60 to 80 grammes of alcohol per day for 10 years before they are at risk of developing alcoholic liver disease. When 160g/day is consumed, the chance of developing alcoholic cirrhosis is 25 times higher. Gender-dependent variances result from unknowns regarding the effects of oestrogen and how alcohol is metabolised. There has been conjecture that social, immunologic, and genetic variables may have an impact on the pathogenic process. A prominent co-morbidity of alcoholic liver disease is chronic hepatitis C infection, which advances to cirrhosis.

Alcoholism is a chronic, progressive condition that can lead to liver damage [5]. Although alcoholism is more prevalent in men, women are considerably more vulnerable to alcohol's damaging consequences [6, 7].

A considerable portion of people worldwide suffer with ALD, which poses serious health issues as well

as financial difficulties [8]. The course of liver illness varies geographically, among different ethnic groups, and through time. Aspartate transaminase (AST) and alanine transaminase (ALT) blood levels are elevated in alcohol-related liver damage [9, 10].

Material method

The present study was carried out at the Index Medical College Hospital and Research Centre in Indore's Department of Biochemistry. After receiving ethical approval and informed agreement, patients with chronic alcoholic illnesses between the ages of 30 and 60 were diagnosed using WHO standards.

From 2019 to 2020, all clinically suspected patients who visited our outpatient department (OPD) and had common symptoms of sickness, such as fever, diarrhea, skin conditions, etc., were chosen for the study. A total of 31 cases of clinically confirmed ALD in people between the ages of 30 and 60 who have a history of heavy alcohol use. With the use of clinical and biochemical data, ALD was identified. 10. The study's controls consisted of 31 healthy patients and staff members from medical colleges who did not exhibit any signs of liver, haematological or biochemical abnormalities.

From the institutional research committee, ethical permission was obtained. Venipuncture was used to get 5 ml of blood when the patient was fasting and under aseptic conditions. Total bilirubin, conjugated and unconjugated bilirubin, aspartate transaminase (AST), alanine transaminase (ALT), and -glutamyl transpeptidase (GGT) were among the biochemical parameters measured using a semi-automated clinical chemistry analyzer (Microlab 300, Vital Scientific, USA) and Bio-Kit (Ranbaxy).

All findings were presented as Mean and standard deviation. The significance of the differences between all the parameters for the controls and the patients was examined using one-way analysis of variance (ANOVA), and a p-value of 0.05 was selected to denote statistical significance. The student T-test was used for the statistical analysis.

Result

A total of 62 adult subjects were enrolled in the outpatient department (OPD) in Index Medical College Hospital and Research Centre, Indore. Regarding sex out of the total patients, 54patients were male andpatients were female. Age of the patients was considered from 30-60 year and they were divided into four groups. Maximum frequency of ALD has been found in 35-40 year age of both sex group patients. There were no statistically significant differences in age and sex between patients and controls (table 1).

Table 1: Association between Study Group and Age Group

Age Group			Group		Total
			Case	Control	
AGES	30-35 Years	N	5	9	14
		%	16.1%	29.0%	22.6%
	36-40 Years	N	9	4	13
		%	29.0%	12.9%	21.0%
	41-45 Years	N	13	12	25
		%	41.9%	38.7%	40.3%
	>=46 Years	N	4	6	10
		%	12.9%	19.4%	16.1%
Total		N	31	31	62
		%	100.0%	100.0%	100.0%
Mean ± S.D			41.48±5.40	40.97±6.621	Non Sig
T Test			0.336		
P Value			0.738		

Table 2: Comparison of Mean Bilirubin between Groups

Variable	Group	N	Mean	Std. Deviation	T test	P Value	Result
Bilirubin	Case	31	1.048	0.6016	3.512	0.001	Significant
	Control	31	0.629	0.2831			

This above table shows the comparison of mean Bilirubin between case and control groups.

T-test was applied to compare the difference between the mean value among Case Group and Control Group which was found to be statistically significant (p<0.05).

The mean value 1.048 was for case group was significantly higher than the mean value 0.629 was for control group.

Table 3: Comparison of Mean AST between Groups

Variable	Group	N	Mean	Std. Deviation	T test	P Value	Result
AST	Case	31	66.665	57.2227	4.356	0.000	Sig
	Control	31	21.581	6.7861			

This above table shows the comparison of mean AST between case and control groups.
T-test was applied to compare the difference between the mean value among Case Group and Control Group which was found to be statistically significant (p<0.05).
The mean value 66.665 was for case group was significantly higher than the mean value 21.581 was for control group.

Table 4: Comparison of Mean ALT between Groups

Variable	Group	N	Mean	Std. Deviation	T test	P Value	Result
ALT	Case	31	48.200	35.3895	4.546	0.000	Sig
	Control	31	18.939	5.6279			

This above table shows the comparison of mean ALT between case and control groups.
T-test was applied to compare the difference between the mean value among Case Group and Control Group which was found to be statistically significant (p<0.05).
The mean value 48.200 was for case group was significantly higher than the mean value 18.939 was for control group.

Table 5: Comparison of Mean GGT between Groups

Variable	Group	N	Mean	Std. Deviation	T test	P Value	Result
GGT	Case	31	80.061	48.3192	6.267	0.000	Sig
	Control	31	24.968	7.7867			

This above table shows the comparison of mean GGT between case and control groups.
T-test was applied to compare the difference between the mean value among Case Group and Control Group which was found to be statistically significant (p<0.05).
The mean value 80.061 was for case group was significantly higher than the mean value 24.968 was for control group.

Discussion

The liver is a multifunction organ that supports various biochemical activities as well as host defense. As a result, liver disease refers to a broad range of conditions, diseases and infections that affect the cells, tissues, structures or functions of the liver 11.
Large amounts of alcohol consumed over time harm the liver, causing ALD and potentially irreversible alcoholic liver cirrhosis. Currently, ALD is diagnosed using relevant laboratory testing and historical drinking habits. Our analysis of 31 ALD patients revealed that the age group between 30 and 40 had the highest prevalence of the disease, which is consistent with earlier research done in western Nepal [12,13,14]. This may be due to gender-specific medical care practises or disparities in drinking habits between the sexes in these contexts. This may be due to hormonal factors, changes in how alcohol is metabolised in the stomach and liver depending on gender, and a delay in medical care for female patients.
In this study, 31 participants who have been diagnosed with alcoholic liver disease are used as cases, while 31 healthy, normal persons are used as controls.
When compared to controls, the case group's mean bilirubin level was 1.048, which was considerably higher than the control group's mean value of 0.629.
When compared to healthy controls in the current investigation, alcoholic liver cirrhosis showed elevated AST and ALT activity, which is highly significant (p 0.001).
Anil Batta's following study 15 found that alcoholic liver disease was associated with elevated AST and ALT levels.
The T-test was used in this investigation to examine the mean value difference between the Case Group and Control Group, which was determined to be statistically significant (P 0.05). The case group's mean value of 48.200 was considerably greater than the control group's mean value of 18.939 in both directions.
The difference in mean value between the Case Group and Control Group was compared using the T-test, and it was discovered to be statistically significant (P 0.05).
The increase in AST in cases was 66.665 U/L in comparison to controls, where the mean AST value was 21.581 U/L. The p value is less than 0.001, which is significant.
Gamma glutamyl transferase's mean value for the case group, 80.061, was substantially greater than the mean value for the control group, 24.968.
This result is in line with studies by H. Nyblom, U. Berggrem, and others, who found that alcoholic

cirrhosis increased aminotransferases and bilirubin levels.

According to a different study by Selinger MJ, Matloff DS, *et al*. [17], people with alcoholic liver disease have a sevenfold increase in serum gamma glutamyltransferase.

Conclusion

The findings of this study showed that drinking alcohol affects a variety of cellular processes, as well as body weight, body mass index and haematological markers. Monitoring the combined levels of GGT, AST and ALT is a sensitive method of determining the degree of alcohol-induced liver damage. The AST/ALT ratio is acknowledged on a global scale as a valid diagnostic indicator for ALD. Primarily affecting the population of men and women in the productive age range. ALD also imposes a significant financial cost on society. This offers trustworthy proof of the liver damage brought on by acute alcohol intoxication. In order to reduce ALD-related morbidity and mortality, we advised screening for alcohol abuse in all adult patients arriving at the hospital.

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