



## ORIGINAL RESEARCH PAPER

## Biochemistry

### ASSESSMENT OF BIOCHEMICAL PARAMETERS IN ALCOHOLIC LIVER DISEASE: A HOSPITAL-BASED STUDY.

**KEY WORDS:** Alcoholic liver disease, pancreatitis

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#### ABSTRACT

**Background And Aim:** The aim of the study is to assess the biochemical parameters in alcoholic liver disease. **Methods:** This hospital-based observational study evaluated the levels of biochemical parameters in patients with ALD. Eighty-nine adult male patients with ALD were included in the study and their blood samples were analyzed for various biochemical parameters, including alanine aminotransferase (ALT), aspartate aminotransferase (AST), total protein, albumin, amylase and lipase. **Results:** The results showed significant elevations in AST (112.85 IU/L) and ALT (70.63 IU/L) indicating hepatocellular injury due to alcohol abuse. Conversely, total protein (6.05 gm%) and albumin (2.94 gm%) showed significant decrease, suggesting protein malnutrition and hypoalbuminemia. Amylase (121.35 U/L) and lipase (172.92 U/L) also exhibited significant elevations, indicating pancreatic dysfunction. **Conclusion:** These findings underscore the importance of considering pancreatic markers in the diagnosis and management of ALD. Early identification of ALD through laboratory testing can lead to timely interventions and improved patient outcomes.

#### INTRODUCTION

Alcoholic liver disease (ALD) results from chronic alcoholism and is also the second leading cause for global human mortality. Stages of alcoholic liver disease are fatty liver, alcoholic hepatitis and alcoholic cirrhosis (irreversible stage). Amount and the period of alcohol abuse have major importance in developing the ALD. According to previous studies women are prone to develop ALD compared to men. Everyone who consumes alcohol will not develop ALD as the development of the disease depend on various factors like-genetic, race, gender, etc. Liver is the first target for alcohol induced damage as it is the primary site of alcohol metabolism. Other organ which is damaged due to alcohol is pancreas. Acute pancreatitis or chronic pancreatitis is complication of ALD. Liver and the pancreas have structural as well as developmental similarities, and the damage caused by the alcohol in both organ have acute and chronic clinical events as well as the mechanism of damage due to alcohol is similar in both of them.

#### Aim

The aim of the study is to assess the biochemical parameters in alcoholic liver disease.

#### Study design

Observational study.

#### Inclusion criteria

- All adult patients of ALD willing participate were included.

#### Exclusion criteria:

- Patients with alcoholic cirrhosis were excluded.

#### METHODS

A facility based observational study was conducted among ALD patients who were admitted in the Institute of BVDU Medical College & Hospital, Sangli. Duration of the study was from Dec 2022 to Aug 2023. Study employed observational design, 89 adult male ALD patients were included.

Blood samples of the patients were collected and the investigations done were- Alanine aminotransferase (ALT), Aspartate aminotransferase (AST), Total protein, Albumin, Amylase and Lipase. All the investigations were done on Fully Automated Abbott Architect Ci 4100

#### Statistical methods

The study utilized MS Excel Software for analysis of data using observational statistics. Values were expressed as Mean and  $\pm$  Standard Deviation.

#### RESULTS

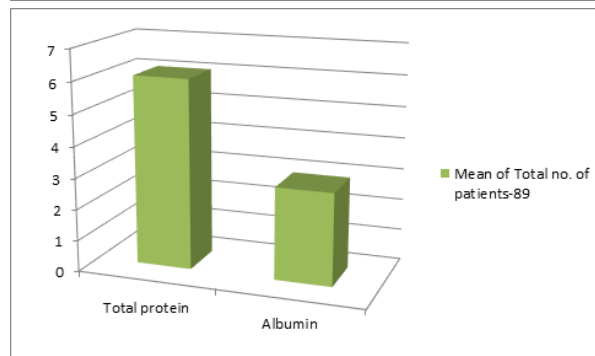
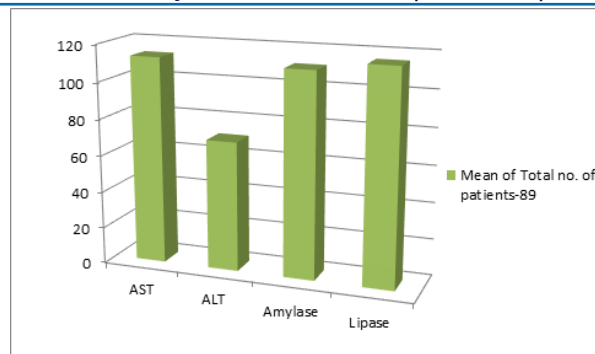
Table 1. Shows the mean levels of the parameters: AST with a mean of 112.85 IU/L showed significant elevation than the population mean, with a Z-score (9.41) indicating standard deviation above the population mean.

ALT with a mean 70.63 IU/L also showed significant elevation than the population mean, with a Z-score 5.38 indicating the standard deviation above the population mean. Total protein and albumin with mean levels 6.05 gm% and 2.94 gm% respectively, showed significant decrease than the population mean, with Z- scores 14.22 and 17.94 respectively, suggesting standard deviation of each below the population mean.

Amylase and lipase with a mean of 121.35 U/L and 172.92 U/L respectively, showed significant elevation than the population mean, with a Z-score 3.16 and 2.19 respectively, suggesting standard deviation above the population mean.

**Table No. 1 Shows the mean levels of Biochemical parameters in ALD patients.**

Sr. No.	Parameters	Mean of Total no. of patients-89	S.D	Normal Range	population Mean	Calculated Z	Tabulated Z at 5% l.o.s	P-Value	Result
1	AST	112.85	90.54	0 – 45 IU/L	22.5	9.41	1.96	p < 0.05	Significant
2	ALT	70.63	84.35	0 – 45 IU/L	22.5	5.38	1.96	p < 0.05	Significant
3	Total protein	6.05	0.73	6.0 – 8.3 gm%	7.15	14.22	1.96	p < 0.05	Significant
4	Albumin	2.94	0.61	3.2 – 5.0 gm%	4.1	17.94	1.96	p < 0.05	Significant
5	Amylase	121.35	160.9	20 – 115 U/L	67.5	3.16	1.96	p < 0.05	Significant
6	Lipase	172.92	589.76	0 – 60 U/L	30	2.29	1.96	p < 0.05	Significant



## DISCUSSION

The study focused on assessing the levels of parameters commonly used for diagnosing ALD. AST with a mean of 112.85 IU/L and ALT with a mean 70.63 IU/L, both showed significant elevations than the population mean, Z-scores of each 9.41 and 5.38 respectively showed a standard deviation above the population mean. This implied prominent damage to the liver, indicating hepatocellular injury due to alcohol. Conversely, the total protein (6.05 gm% ) and albumin (2.94 gm%) showed significant decrease with a Z-score (14.22 and 17.94) below the population mean, suggesting protein malnutrition and hypoalbuminemia due to alcohol abuse. Amylase (121.35 U/L) and lipase (172.92 U/L) the pancreatic enzymes also showed significant elevation than the population mean, supported by the Z-score 3.16 and 2.19 respectively addressing the pancreatic dysfunction. Clinical impression: The study finding underscores the need for assessing the pancreatic markers as well in the ALD patients. Significantly elevated levels of amylase and lipase seen in ALD patients in the study imply that monitoring pancreatic enzymes while diagnosing ALD is equally important to predict the future complications.

## CONCLUSION

Early identification of ALD through laboratory testing can lead to timely interventions and treatment potentially improving patient's outcomes. The results highlight the need for comprehensive management of ALD patients, including nutritional support and management of fluid overload. Additionally the study underscores the importance of considering pancreatic dysfunction as a comorbid condition in patients with ALD. Overall the study provides valuable insights to the diagnostic utility of liver enzymes and proteins in detecting ALD and underscores the need for multidisciplinary care to manage this complex condition.

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