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Research Article

### ANALYSIS OF CHANGES IN THE LIVER ENZYMES IN THE PATIENTS SUFFERING FROM LIVER CIRRHOSIS

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**Abstract:**

**Introduction:** Liver is a complex organ with interdependent metabolic, excretory and defense functions. The use of several screening tests improves the detection of hepato-biliary abnormalities, helps differentiate the basis for clinically suspected disease and determine the severity of liver disease.

**Objectives:** The main objective of the study is to analyze the changes in the liver enzymes in the patients suffering from liver cirrhosis.

**Methodology of the study:** This cross sectional study was conducted at RHC Khalian Bajwat, Sialkot during October 2018 to February 2019. The data was collected through non-probability sampling technique. The data was collected from 100 liver cirrhosis patients. The age range for this study was 20 to 60 years. Blood sample was collected for the serum analysis of liver enzymes. Alanin aminotransferase (ALT) and Aspartate aminotransferase (AST) were assayed by Reitman and Frankel method.

**Results:** The data was collected from 100 patients of both genders. The mean age of the patients were  $45.67 \pm 3.56$  years. The levels of ALT in patients was  $258.2 \pm 91.73$ ,  $79.66 \pm 28.63$ , and  $50.73 \pm 8.4$  respectively as compared to normal control ( $11 \pm 3.42$ ). Aspartate aminotransferase levels were significantly raised in viral hepatitis, alcoholic liver disease and cirrhosis patients. The levels being  $157.80 \pm 67.8$ ,  $164 \pm 54.35$ , and  $62 \pm 12.17$  respectively as compared to normal control ( $13 \pm 3.54$ ).

**Conclusion:** It is concluded that the level of all liver enzymes become increases in cirrhosis condition. Liver associated enzymes tests are used to detect, specifically diagnose, and estimate the severity of hepatic disease.

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**INTRODUCTION:**

Liver is a complex organ with interdependent metabolic, excretory and defense functions. The use of several screening tests improves the detection of hepato-biliary abnormalities, helps differentiate the basis for clinically suspected disease and determine the severity of liver disease. Chronic liver disease (CLD) is a major cause of morbidity and mortality and is quickly becoming an increasing burden on the health care system. Both CLD and cirrhosis are the fifth leading cause of death in the 45–61 age group and 12th leading cause overall. In 2010, the National Center for Health Statistics (NCHS) and Centers for Disease Control and Prevention (CDC) reported 31,903 deaths from CLD and cirrhosis [1]. This number is expected to increase steadily well in the next decade. The prevalence of cirrhosis in the general population is difficult to determine and was estimated to be 1 in 679 (0.15%) in a recent study published by the National Institute of Health (NIH). This could represent a gross underestimation of 1 in 370 (0.27%) as suggested in a recent study by Scagilone et al, where the prevalence was estimated based on the 2010 US census [2]. The liver is the largest organ of the body, weighing 1 to 1.5 kg and representing 1.5 to 2.5% of the lean body mass [3]. Blood tests used for initial assessment of liver disease include measuring levels of serum Alanine and Aspartate aminotransferases (ALT and AST), alkaline phosphatase, and others. The pattern of abnormalities generally points to hepatocellular versus cholestatic liver disease and helps to decide whether the disease is acute or chronic and whether cirrhosis and hepatic failure are present. Serum enzyme levels fluctuate widely from normal to moderately abnormal, with values rarely into the high hundreds [4]. Marked elevation of aminotransferases in the appropriate clinical context indicates acute cell necrosis caused by viral infection, drugs, toxins, alcohol, or Ischemia [5]. Hepatocellular carcinoma (HCC) accounts for >80% of liver cancer cases. Approximately 78% of HCC was attributable to hepatitis B virus (HBV) or hepatitis C

virus (HCV) infection<sup>4</sup>. Also, presence of cirrhosis from any cause markedly increases HCC risk [6].

**Objectives:**

The main objective of the study is to analyze the changes in the liver enzymes in the patients suffering from liver cirrhosis.

**Methodology of the study:**

This cross sectional study was conducted at RHC Khalian Bajwat, Sialkot during October 2018 to February 2019. The data was collected through non-probability sampling technique. The data was collected from 100 liver cirrhosis patients. The age range for this study was 20 to 60 years. Blood sample was collected for the serum analysis of liver enzymes. Alanin aminotransferase (ALT) and Aspartate aminotransferase (AST) were assayed by Reitman and Frankel method. Gamma Glutamyl Transferase (GGT) was determined. Statistical analysis was done using SPSS for Windows version 17.0. Results expressed as mean  $\pm$ SD). Comparison of variables between two groups performed with student t-test for continuous variables. The p values < 0.05 were considered statically significant.

**RESULTS:**

The data was collected from 100 patients of both genders. The mean age of the patients were  $45.67 \pm 3.56$  years. The levels of ALT in patients was  $258.2 \pm 91.73$ ,  $79.66 \pm 28.63$ , and  $50.73 \pm 8.4$  respectively as compared to normal control ( $11 \pm 3.42$ ). Aspartate aminotransferase levels were significantly raised in viral hepatitis, alcoholic liver disease and cirrhosis patients. The levels being  $157.80 \pm 67.8$ ,  $164 \pm 54.35$ , and  $62 \pm 12.17$  respectively as compared to normal control ( $13 \pm 3.54$ ). Alkaline phosphatase levels were significantly raised in viral hepatitis, alcoholic liver disease and cirrhosis patients. Gamma glutamyl transpeptidase levels were significantly raised in viral hepatitis, alcoholic liver disease and cirrhosis patients.

**Table 01:** Level of all liver enzymes in liver cirrhosis

	Control	Viral Hepatitis	Alcoholic Liver	Liver cirrhosis
ALT	11.20 $\pm$ 3.43	258.20 $\pm$ 91.73	79.66 $\pm$ 28.63	50.73 $\pm$ 8.40
AST	13.00 $\pm$ 3.54	157.80 $\pm$ 67.81	164.00 $\pm$ 54.35	62.13 $\pm$ 12.17
ALP	36.20 $\pm$ 9.54	208.00 $\pm$ 54.40	180.33 $\pm$ 33.30	116.00 $\pm$ 11.98
GGT	26.73 $\pm$ 4.02611	115.33 $\pm$ 28.31	181.33 $\pm$ 60.66	248.66 $\pm$ 43.5

**DISCUSSION:**

An indicator that should make the clinician highly suspicious of alcohol-related liver injury is AST: ALT ratio of 2:1 or more. Gamma-glutamyl transferase (GGT) is another sensitive but non-specific marker for hepatic injury which cannot be used solely to diagnose alcohol-related hepatic insult. Levels of GGT greater than twice the normal values in addition to AST: ALT ratio >2 strongly indicate alcohol-induced liver injury as well [8]. The liver associated enzymes, Alanine aminotransferase (ALT), Aspartate aminotransferase (AST), and gamma glutamyl transferase (GGT) are measures of liver homeostasis. Serum amino transferases such as alanine aminotransferase (ALT) and aspartate aminotransferase (AST) indicate the concentration of hepatic intracellular enzymes that have leaked into the circulation. These are the markers for hepatocellular injury [9]. The aminotransferases (transaminases) are sensitive indicators of liver cell injury and are most helpful in recognizing acute hepatocellular diseases such as hepatitis<sup>8</sup>. The pattern of the aminotransferase elevation can be helpful diagnostically. This helps to differentiate ALD from other liver diseases. In this study AST, ALT ALP, GGT levels were significantly raised in viral hepatitis, alcoholic liver disease and cirrhosis patients as compared to control. In viral hepatitis AST, ALT and ALP Levels were significantly high as compared to alcoholic liver disease and cirrhosis [10].

**CONCLUSION:**

It is concluded that the level of all liver enzymes become increases in cirrhosis condition. Liver associated enzymes tests are used to detect, specifically diagnose, and estimate the severity of hepatic disease.

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