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Research Article

**ANALYSIS OF CHANGES IN THE LIVER ENZYMES IN THE  
PATIENTS SUFFERING FROM LIVER CIRRHOSIS****Dr. Hazim Afzal<sup>1</sup>, Dr. Tabassum Bashir<sup>2</sup>, Dr. Anum Abbas<sup>3</sup>**<sup>1</sup>MO at BHU Nathu Sevia District Gujranwala.<sup>2</sup>Assistant Professor, Department of Paediatrics Nawaz Sharif medical college, Gujrat<sup>3</sup>WMO at DHQ hospital Lodhran

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**Abstract:**

**Introduction:** 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. Liver is a complex organ with interdependent metabolic, excretory and defense functions.

**Objectives of the study:** The basic aim of the study is to find the changes in the serum liver enzymes in those patients who is suffering from liver cirrhosis. **Material and methods:** This study was conducted at hospitals of Gujranwala and Nawaz Sharif medical college Gujrat during June 2018 to July 2018. This study was done with the permission of ethical committee of hospitals. Present study was comprised of total 60 subjects both male and female. In this research analysis we divided the subject's into groups. One is control group which consist of 15 Healthy control and 45 case group aged between 30 -50 years, each case group consisted of 15 male patients of similar age suffering with Viral Hepatitis, Alcoholic Liver disease (more than 10 yrs) and liver cirrhosis. **Results:** The results indicated that the level of all liver enzymes become increases in all types of liver issues. Alanine aminotransferase levels were significantly raised in viral hepatitis, alcoholic liver disease and cirrhosis patients. The levels being  $258.2 \pm 91.73$ ,  $79.66 \pm 28.63$ , and  $50.73 \pm 8.4$  respectively as compared to normal control ( $11 \pm 3.42$ ). **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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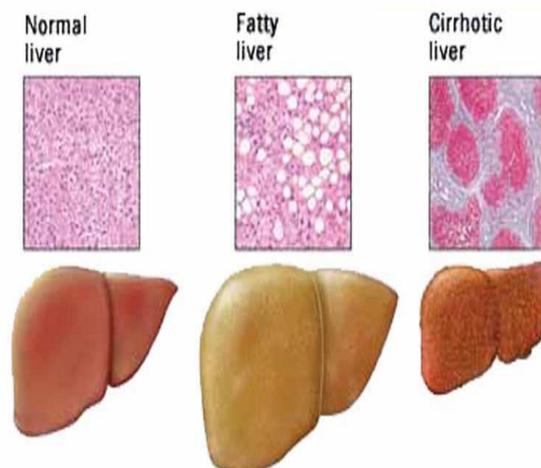
**INTRODUCTION:**

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. 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 [1]. 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 [2]. Marked elevation of aminotransferases in the appropriate clinical context indicates acute cell necrosis caused by viral infection, drugs, toxins, alcohol, or Ischemia [3].

Worldwide, liver cancer is the second leading cause of cancer-related death in men and the sixth in women. 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 [4]. Also, presence of cirrhosis from any cause markedly increases HCC risk. The overall age-adjusted HCC incidence rate in the United States tripled between 1975 and 2005, partially accounted for by the increase of HCV infection and the influx of immigrants from HBV endemic regions. According to the World Health Organization, HCC has the second highest increase in overall death rate of all malignancies and its burden is expected to continue to increase in the next a few decades[5]. The five-year survival rate for HCC is <5% in all patients whereas >30% in patients diagnosed in early stages and receive surgery or liver transplantation. These facts highlight the importance of clinical surveillance, risk prediction, targeted prevention, and early diagnosis in HCC management.

Serum liver enzymes such as alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), and  $\gamma$ -glutamyltransferase (GGT), are tested routinely and automatically in current clinical settings [6]. These enzymes are commonly elevated in patients with liver diseases and thus may reflect the status of liver

injury. Physicians generally use significant elevations of liver enzyme levels as complementary markers to aid the diagnosis of various diseases. For example, elevations of ALT and AST may indicate the presence of hepatocellular predominant disorders while elevations of ALP and GGT may implicate cholestatic predominant diseases [7].



**Figure 01:** different types of liver conditions

**Objectives of the study**

The basic aim of the study is to find the changes in the serum liver enzymes in those patients who is suffering from liver cirrhosis.

**MATERIAL AND METHODS:**

This study was conducted at hospitals of Gujranwala and Nawaz Sharif medical college Gujrat during June 2018 to July 2018. This study was done with the permission of ethical committee of hospitals.

**Data collection**

Present study was comprised of total 60 subjects both male and female. In this research analysis we divided the subject's into groups. One is control group which consist of 15 Healthy control and 45 case group aged between 30 -50 years, each case group consisted of 15 male patients of similar age suffering with Viral Hepatitis, Alcoholic Liver disease (more than 10 yrs) and liver cirrhosis. Alanin aminotransferase (ALT) and Aspartate aminotransferase (AST) were assayed by Reitman and Frankel method. Alkaline phosphatase was determined by King and Kind. Gamma Glutamyl Transferase (GGT) was determined by SZASZ.

**Statistical Analysis**

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 AND DISCUSSION:

The results indicated that the level of all liver enzymes become increases in all types of liver issues. Alanine aminotransferase levels were significantly raised in viral hepatitis, alcoholic liver disease and cirrhosis patients. The levels being 258.2±91.73, 79.66±28.63, and 50.73± 8.4 respectively as

compared to normal control (11±3.42). Aspartate aminotransferase levels were significantly raised in viral hepatitis, alcoholic liver disease and cirrhosis patients. The levels being 157.80±67.8, 164±54.35, and 62±12.17 respectively as compared to normal control (13±3.54) Alkaline phosphatase levels were significantly raised in viral hepatitis, alcoholic liver disease and cirrhosis patients. Gamma glutamyle 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
<b>ALT</b>	11.20±3.43	258.20±91.73	79.66±28.63	50.73±8.40
<b>AST</b>	13.00±3.54	157.80±67.81	164.00±54.35	62.13±12.17
<b>ALP</b>	36.20±9.54	208.00±54.40	180.33±33.30	116.00±11.98
<b>GGT</b>	26.73±4.02611	115.33±28.31	181.33±60.66	248.66±43.5

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 [7]. The aminotransferases (transaminases) are sensitive indicators of liver cell injury and are most helpful in recognizing acute hepatocellular diseases such as hepatitis [8]. 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 [9]. Moreover alcoholic liver disease patients have more AST, ALT and ALP as compared to cirrhosis [10].

In addition to viral infections and cirrhosis, environmental factors such as smoking and alcohol intake are well known risk factors of HCC development. In our study, we noticed that ever smoking conferred a borderline increase in HCC risk which was consistent with previous studies [11]. Many studies have suggested that there was a threshold of alcohol intake in relation to HCC risk. Moreover, some studies reported that light drinking might have a protective effect for HCC development. Unfortunately, we do not have the data on the intensities of smoking and drinking in this study

population, which limited our further analyses of their interactions with GGT on HCC development [12].

### 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. Recognizing the different patterns of liver injury can be used as a guide to direct further evaluation of diseases that affect the liver. In combinations with the physical examination and history, the evaluation of other serum enzymes should aid in differentiating the source of increased Liver associated enzymes level and ratio.

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