Original Article

Analysis of biochemical markers in alcoholic liver cirrhosis

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Abstract

This study was done to analyze the various biochemical parameters that aid the evaluation of a case of alcoholic liver cirrhosis. In a setting of Alcoholic Liver Disease (ALD), patients with liver cirrhosis can progress to end stage liver disease at a faster pace. Numerous parameters are available to diagnose and assess the progression of cirrhosis to end stage liver disease. The aim of this study is to assess few of these biochemical parameters which can help us to identify liver cirrhosis in an alcoholic liver disease. The parameters in this study included serum Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Gamma Glutamyl Transferase (GGT), Albumin, Total Bilirubin and Prothrombin Time-International Normalized Ratio (PT-INR). We assessed a total of 40 patients with alcoholic liver disease in this study, to ascertain the pattern of variation in the above mentioned biochemical parameters with the onset and progression of liver cirrhosis. After the detailed review and analysis of the various biochemical investigations in these subjects we found that AST/ALT ratio was more than 2:1 in 75% of our patients, serum albumin was less than 2.5 in 83.7% and GGT was elevated than normal in 67.5%. Total bilirubin was elevated (i.e., more than 1.2) in 77.5% and PT-INR value more than1.5 was noted in 72.5% of our cases. These results were corresponding with the expected laboratory results in alcoholic liver cirrhosis thereby establishing their role in predicting the advancement of early alcoholic liver disease to cirrhosis and end stage liver disease.

Keywords: liver cirrhosis.

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INTRODUCTION

Liver cirrhosis is a disease in which liver cells are destroyed without being regenerated, they become solid and are decreased in number. Here the normal cells are replaced with scar tissue, and the liver becomes disturbed in the performance of its essential functions.[1] Alcoholic liver disease is a general term used to refer to the spectrum of alcohol-related liver injuries. There is a strong correlation between the prevalence of alcoholic liver disease, specifically cirrhosis, and a country's annual per capita alcohol consumption.[2] The increased rate of consumption of alcoholic beverages increases the occurrence of chronic liver disease and its progression to liver cirrhosis. The adverse effects of alcohol can be manifested in liver damage ranging from fibrosis to end stage of cirrhosis and may eventually lead to carcinoma of liver. The progression of alcoholic liver disease is characterized by steatosis, inflammation, necrosis and cirrhosis. There is an increased risk of development of hepatocellular carcinoma in such a cirrhosed liver. When severe Cirrhosis occurs, death is the outcome.[3] The diagnosis of alcoholic liver disease can generally be made based on history, clinical and laboratory findings. However, it can sometimes be clinically challenging as there is no single diagnostic test that confirms the diagnosis and patients may not be sincere about their degree of alcohol consumption. It is in such circumstances that the biochemical liver enzmes come to clinician's aid. The serum gamma glutamyl transferase is well known markers of cirrhosis and is considered very sensitive for acute liver injury. Serum albumin levels are also noted to be higher in patients with alcoholic cirrhosis[4] Hyperbilirubinemia and Hypoalbuminemia were also observed to be common findings associated

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with alcoholics. The serum transaminases viz, aspartate aminotransferase (AST) and alanine aminotransferase (ALT) are said to be significantly elevated in decompensated cirrhosis. The pattern of elevation in transaminases is helpful in making a diagnosis of liver injury due to alcohol as AST is typically two to three times greater than ALT in alcoholic liver injury. [(2)]In this study we are trying to appraise the role of these parameters in serving as potential diagnostic tools for diagnosis of the diseases.

MATERIALS AND METHODS

This is a retrospective study done in 40 patients who were diagnosed cases of alcohol induced liver cirrhosis. The data pertaining to the patient details, clinical findings and various investigations, with special emphasis to biochemical markers including serum Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Gamma Glutamyl Transferase (GGT), Albumin, Total Bilirubin and PT-INR, was collected from the medical records department. The study duration was 1 year, from January 2015 to December 2015. The cases were selected based on the inclusion and exclusion criteria mentioned below. The values obtained were then compared with the standard laboratory reference values and assessments were made. These results were then analyzed using standard statistical methodology to arrive at the final results about the pattern of variations of these biochemical parameters in cirrhosis. Ethical clearance was obtained from the ethical committee of the institution.

Inclusion Criteria

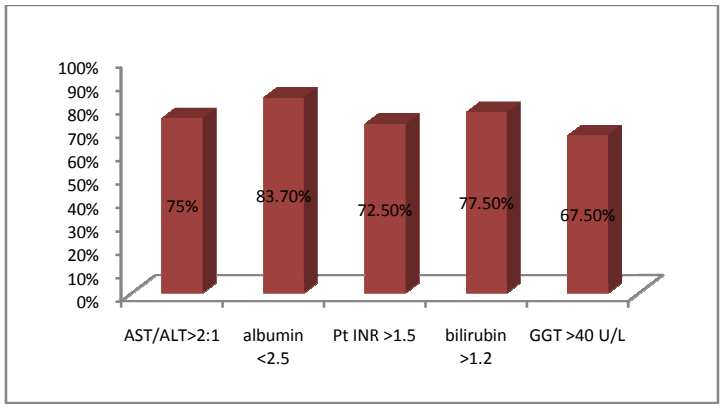
- Patients presenting with liver cirrhosis of alcoholic etiology.
- Age greater than 18 years.

Exclusion Criteria

- Patients with hepatic encephalopathy.
- Patients with bleeding manifestations.
- Patients with renal and cardiac failure.

RESULTS AND CONCLUSION

Of the 40 patients with alcohol induced liver cirrhosis who were analyzed, it was found that AST/ALT ratio was more than 2:1 in 30 patients, which is 75 % of the study group. Serum albumin, which is another important marker, was less than 2.5 in 33 of them which makes 83.7% and GGT was elevated more than the normal reference value in 27 making 67.5% of total cases. Total bilirubin was elevated (i.e., more than 1.2) in 31 patients, which is 77.5%. PT-INR value more than1.5 was noted in 29 out of the 40 patients which is 72.5% of total cases. These values were abnormal in the greater majority as expected, thereby confirming that in liver cirrhosis biochemical factors such as increase of GGT, decrease of albumin, increase of AST/ALT ratio, increase of the total bilirubin and increase of PT- INR can be of significant help in diagnosing challenging cases. Our study also reemphasize the fact that with rising levels of transaminases, their altered ratio along with variation in the other biochemical parameters play a key role in diagnosing the progression of liver disease in a setting of alcohol induced liver damage.



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