



Association of Non-Alcoholic Fatty Liver Disease and Hepatic Enzyme Levels – A Case Control Study

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Abstract

Non alcoholic fatty liver disease (NAFLD) is considered as the hepatic representation of metabolic syndrome. It is one of the leading cause of asymptomatic elevation of serum transaminases in the western world. Our study aimed at recognizing the association between NAFLD and hepatic enzymes in our population. At the end of our study we were able to demonstrate significant elevation of AST (P=0.046) and ALT (P=0.021). So we conclude that although previously thought as a condition of unknown significance NAFLD is associated with an asymptomatic elevation of hepatic transaminases.

Keywords- non alcoholic fatty liver disease, serum transaminases, AST, ALT.

Introduction

Non-alcoholic fatty liver disease (NAFLD) can be considered as the hepatic representation of the metabolic syndrome.^{1,2} Like western population the incidence of metabolic syndrome and thus non alcoholic fatty liver disease is on the rise in our population also.³ Non-alcoholic fatty liver disease is characterized by increased hepatic triglyceride (TG) accumulation that occurs in the absence of excess alcohol consumption (>20 g/day). NAFLD includes a spectrum of diseases ranging from steatosis alone to non-alcoholic steatohepatitis (NASH).⁴

Approximately 29% of NASH patients will develop cirrhosis within 10 years. End-stage liver disease and hepatocellular carcinoma are liver-specific endpoints of NAFLD.^{5,6} The association of elevated liver enzymes and NAFLD has also been suggested by various studies. Patients with NAFLD are often identified by asymptomatic elevation of liver enzymes, most frequently of serum alanine aminotransferase (ALT), and nonalcoholic hypertransaminasemia, in which viral or other causes of liver disease are excluded, has been used as a surrogate marker for NAFLD.^{7,8}

Objectives

The study proposes to find out the association of serum AST, ALT and ALP levels with Non Alcoholic Fatty Liver Disease in our population.

Materials and methods

The study was done in cases diagnosed with fatty liver by ultrasound in the radiology department of Pushpagiri Medical College Hospital who does not have a daily alcohol consumption of > 20 g/day or a weekly consumption of > 140g/day who are willing to participate in the study by giving an informed consent and belong to the age group 20- 60 yrs . Controls were healthy adult individuals in the age group of 20 – 60 who are not having NAFLD by USG evaluation. The level of serum transaminases were obtained from the medical record of the participant. The level of hepatic enzymes was expressed as mean \pm SD and level of significance tested using the unpaired t test.

Results

A total of 33 cases and 31 controls were selected according to the inclusion and exclusion criteria. (Table 1) The serum aspartate amino transferase level was higher in persons affected with NAFLD (50.06 \pm 55.87) compared normal subjects (29.13 \pm 13.4) and the difference was statistically significant with a p value of 0.046. The difference in the alanine amino transferase level between cases (70.94 \pm 73.19) and controls (37.26 \pm 32.58) was more significant ($p = 0.021$) towards cases as compared to AST levels. But the serum alkaline phosphatase levels failed to show any significant difference between cases (199.27 \pm 45.26) and controls (192.16 \pm 60.82) with a p value of 0.59.

Discussion

NAFLD is a condition characterized by increased hepatic lipid accumulation leading to inflammation and extensive fibrosis; histologically simulating alcoholic cirrhosis. It can be regarded as the hepatic manifestation of metabolic syndrome which is now becoming a global pandemic.^{1,2,3} Prevalence of the disease is estimated to be around 9-32% in the

general Indian population. The metabolic markers of the disease proposed are elevated liver enzymes Aspartate transaminase (AST), Alanine Transaminase (ALT), Gamma Glutamyl Transferase (GGT), hypertriglyceridemia and insulin resistance. Serum concentrations of these enzymes are elevated above the normal in liver cell injury.^{7,8} We tested the hepatic enzyme profile in patients with NAFLD with normal healthy subjects. The study showed significant increase in serum AST and ALT levels in patients with NAFLD, compared to the normal healthy controls. The rise in plasma level was even more significant for ALT than that for AST. No significant difference was noted in the plasma levels of alkaline phosphatase between two groups.

Table 1

	Cases	Controls	P value
Age	44.09 \pm 10.93	42.42 \pm 8.99	0.5
Sex			
Male	21(66%)	16 (52%)	0.13
Female	12(34%)	15 (48 %)	
AST	50.06 \pm 55.87	29.13 \pm 13.4	0.046
ALT	70.94 \pm 73.19	37.26 \pm 32.58	0.021
ALP	199.27 \pm 45.26	192.16 \pm 60.82	0.59

Conclusions

Our conclusion is that like in western population Non alcoholic fatty liver disease is a cause of asymptomatic elevation of hepatic transaminases in our population.

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