GGT and SGPT - A Rising Marker in Diagnosis of Non-alcoholic Fatty Liver Disease

TRIPTI SAXENA, ANITA ARYA[2], ANURADHA JAIN RATHORE[1], NIKHIL RAJAK[1], SABIHA NAZ[1] and RAKESH SHAH[1]

[1]Department of Medical Biochemistry, Gandhi Medical College, Bhopal, India.
[2]Department of Medicine, Gandhi Medical College, Bhopal, India.

ABSTRACT

Nonalcoholic fatty liver (NAFLD) in one of the major cause of fatty liver, occurring when fat is deposited (steatosis) in the liver not due to excessive alcohol. It is related to insulin resistance and the metabolic syndrome. Nonalcoholic steotohepatitis (NASH) is the most extreme form of NAFLD and is regarded as a major cause of the liver damage. Study has been carried out in 50 patients suffering from nonalcoholic fatty liver disease age groups of 20-60 years compared to 50 age and sex matched control. Mostly the age group of 40-50 years of cases is found significant as compared to control group of 40-50years. Biochemical parameters estimated were SGPT AND GGT. SGPT was found significantly($p<0.0001$) increased(60.75±8.85) in cases as compared to control group (27.71±6.87) and GGT was found to be significantly($p<0.001$) decreased (20.71±6.07) as compared to control group (21.90±8.44) This data suggests that the elevation of enzymes can be a particular and specific marker of nonalcoholic fatty liver disease but the value of GGT is not significant marker however detailed studies with large sample size may be required to establish liver enzymes as marker of nonalcoholic fatty liver disease.

Key words: NAFLD (non alcoholic fatty liver disease), NASH (Nonalcoholic steatohepatitis) GGT (Gamma glutamyltransferase) and MS (Metabolic syndrome).

INTRODUCTION

Nonalcoholic fatty liver disease is a condition by excessive fat accumulation in the form of triglycerides (steatosis) in the liver (>5% of hepatocytes histologically)[4].

NAFLD is widely considered to be liver expression of the metabolic syndrome-disease related to diabetes mellitus type 2, insulin resistance, central obesity, hyperlipidemia (low-density lipoprotein cholesterol, hypertriglyceridemia). NAFLD will become an increasingly common liver problem in both rich and poor countries, increasingly the global burden of liver disease and affecting public health and health-care cross globally[9]. The prevalence of Nonalcoholic fatty liver disease has doubled during last 20 years, whereas the prevalence of other chronic liver disease has remained stable or even decreased[5].

NAFLD has emerged as the most common liver disease in the "Western Economics" prevalence of nonalcoholic fatty liver disease is rising in the Asia-Pacific region as the society is becoming affluent and traditional lifestyles changes (increasing fat in the diet, less physical activity, increasing prevalence of type 2 diabetes). Nonalcoholic fatty liver disease occurs approximately in 20% obese and 5% overweight subjects[6].

NAFLD are now being increasingly recognized as a major health burden. The prevalence of fatty liver in INDIA has been shown to as high as 15-30%, which is similar to that reported from same of the western countries. Now it has been documented that number of these cases can progress to fibrosis, cirrhosis, liver failure and hepatocellular carcinoma.

So many studies has been done on GGT and SGPT. The levels of GGT was within the normal range but the level of SGPT was found significantly (p<0.001) increased in age group of 40-50 years patients. The present study has been done at Gandhi Medical College, Bhopal.

MATERIAL AND METHODS

The study consist of 50 patients of nonalcoholic fatty liver disease, who attended the OPD of the Medicine department of Hamidia Hospital associated with Gandhi Medical College, Bhopal. The control group consisted of 50 healthy adults, who have been matched for Age, Sex BMI and socioeconomic status. The blood samples were collected from both control and cases for a series of laboratory investigation using standard protocols and after taking consent from patients. The study was approved by the Institutional Ethical Committee, for Biomedical research.

Estimation of GGT (Gamma glutamyltransferase)

GGT is an enzyme that transfers gamma glutamyl functional group GGT was estimated by end point reaction method it working reagent prepared by mixing of 250 mg of L gamma-glutamyl-p-nitroarilide 872 mg of glycyl-glycine and 672 mg of magnesium chloride in 300 ml of AMP buffer, pH 8.6 sodium hydroxide reagent 0.0075 M. P-nitroaniline standard 12.4 mg/dl.(10)

The wavelength of 405 mm, violet filter can be used to estimate the GGT. The normal value of GGT 5 to 45 IU. Our study shows the GGT level of patients was significantly less as compare to control group.

Table 1 shows that the GGT level was less significant (p<0.001) in NAFLD as compared to control group. Most of the cases in age group 40-

50yrs have low GGT level compare to control group

Estimation of SGPT

SGPT are also called alanine amino transferase (ALT) as alanine amino transferase (ALAT) is an enzyme present is hepatocytes (liver cells). SGPT Rises dramatically in acute liver damage. Elevated SGPT levels may be found in up to 50% of patients with simple steatosis and are present in 80% of patient with advanced NAFLD.

The wavelength of 340 nm green filter paper can be used to estimate the SGPT. The normal value of SGPT are 5 to 45 IU/L. Our study shows that the SGPT levels of patients were significantly higher as compare to control group.

Table 2 shows that the SGPT level was significantly higher in NAFLD patients as compare to control group. Most of the cases are in age group of 40-50 years as compare to control group. The p value (p <0.001) was considered significant presented are mean(Standard deviation).

Limitation of Study

Test samples were collected from patients who attended the OPD of medicine, department, and diagnosed on the basis of BMI (Body Mass Index) and ultrasonography (USG) in department of Radiology. The study comprises of 50 cases with age group of 20-60 years. The laboratory of Biochemistry Department is well equipped with semiautoanalyzer, calorimeter and spectrophotometer. All investigation method used in this study are standardized in our laboratory.

RESULTS

The present study has done in tertiary institute to estimate GGT, SGPT in patient of nonalcoholic fatty liver disease and in comparison with control group.

Mostly the age group of 40-50yrs of cases is found significant as compare to control group 40-50 yrs.

SGPT was found significantly (p<0.0001) increased (60.75±8.85) in cases as compare to control group (27.71±6.87) and GGT was found to

Table 1: Age wise comparision of GGT between cases and control

S. No.	Age group	Mean ± SD (Cases)	Mean ± SD(control)	P value
1.	20-30	23.87±9.84	24.71±6.90	<0.001
2.	30-40	21.90±8.44	84.75±8.63	<0.001
3.	40-50	20.71±6.07	21.90±8.44	<0.001
4.	50-60	22.33±6.15	25.92±7.77	<0.001

Table 2: Age wise comparison of SGPT between cases and control

S. No.	Age group	Mean ± SD (Cases)	Mean ± SD(control)	P value
1.	20-30	50.09±9.20	26.20±8,89	<0.0001
2.	30-40	60.75±6.25	29.82±6.40	<0.0001
3.	40-50	60.75±8.85	27.71±6.87	<0.0001
4.	50-60	55.15±9.75	28.00±3.39	<0.0001

be significantly decreased (p<0.001) ,(20.71±6.07) as compare to control group (21.90±8.44).

DISCUSSION

Non alcoholic fatty liver disease is a multifactorial disorder with contribution of a variety of genetic code and environmental features that uptill has no effective treatment. But poorly defined mechanism including for fatty acid and cholesterol accumulation accompanied by oxidative stress and inflammation.

In our study the level of SGPT (ALT) increases significantly (p>0.001) as compared to control group and GGT was found less significantly decreased as compare to control group(p<0.001).

The similar study was done in Jakarta hospital 2008 was reported to be (23.18±10.54) the mean range of SGPT are higher but the level of GGT are less Sumit et al. in 2008 V.K. Dixit et al. in Jakarta Hospital.(1)

Amarapurkar et al in India found more males with nonalcoholic fatty liver than females (24.6% vs. 13.6%).the reason nonalcoholic fatty liver is found more frequently in males than the in females may be due to an excess of intra abdominal fat in males.The study showed that GGT concentration is proportional to the degree of nonalcoholic fatty liver ,it may be assumed in GGT is correlated with nonalcoholic fatty liver.

CONCLUSION

The present study showed that the GGT was less or decreased as compare to control group mean value. The fall in GGT are seen in age group of 40-50 years of patients. The present study confirm that there is less increases value of GGT as compare to the control group.

In our study showed that the SGPT was highly increased as compare to control group mean value.In cases levels SGPT are found increases in 40-50 years of patients mostly NAFLD. The present study confirm that there is highly increased value of SGPT as compare to the control group.

Currently, the only established treatment is weight loss since obesity underlies insulin resistance. Fasting inhibits cholesterol and fatty acids synthesis and has protective effect on lipid metabolism. Further two different obesity treatment drugs are currently on the market : orlistat which reduces intestinal fat absorption, and sibutramine, an appetite suppressant.

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