



Analysis of LFT in Obese Diabetic and Non-obese Diabetic Patients.

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ABSTRACT

This study was aimed to analyse the LFT levels in patients with obesity and diabetics and patients only with diabetics. The study was done using 30 obese diabetic patients and 30 non-obese diabetic patients. The BMI and LFT levels of the patients were estimated to analyse if obesity influences LFT levels in diabetic patients. There was significant rise in the levels of gamma GT and globulin in obese diabetic than non-obese diabetic patients. The levels of albumin were lowered. The concentrations of SGOT, SGPT, total bilirubin, alkaline phosphatase and total protein were not significantly high. When diabetic patients are obese, their LFT levels are altered compared to diabetic patients who are not obese. Thus, obese diabetic patients have more risk of liver diseases.

Keywords: Diabetes, obesity, LFT, liver diseases.

INTRODUCTION

The liver plays a major role in the regulation of carbohydrate metabolism, as it uses glucose as a fuel, it has the capability to store glucose as glycogen and also synthesize glucose from non-carbohydrate sources. This key function of liver makes it vulnerable to diseases in subjects with metabolic disorders, particularly diabetes¹. The liver has a major role in glucose homeostasis and, in liver diseases, hepatic carbohydrate metabolism is commonly disturbed. Altered portal insulin levels and the insulin/glucagon ratio may influence hepatocyte function and integrity in diabetic patients and predispose them to various hepatic disorders²⁻⁷. Liver function tests (LFTs) are commonly used in clinical practice to screen for liver disease, monitor the progression of known disease, and monitor the effects of potentially hepatotoxic drugs. The most common LFTs include the serum aminotransferases, alkaline phosphatase, bilirubin, albumin, and prothrombin time⁸. The biochemical tests that reflect liver cell damage or synthetic and excretion function are the main indicators of liver status and functions. These tests include liver enzymes: Alanine aminotransaminase, aspartate, aminotransaminase, alkaline phosphatase, gamma glutamyl transpeptidase. The other important tests are serum bilirubin, albumin, and international normalised ratio. In clinical practice, these tests or parameters are used to guide the measurement of liver diseases. Uncommonly, abnormalities of liver enzymes are found in asymptomatic healthy individuals⁹. In obese subjects, the liver function tests derangements have been noticed to be more frequent than in non obese ones due to the high prevalence of non alcoholic fatty liver disease and its consequences¹⁰⁻¹³. Increased activities of liver enzymes such as aspartate aminotransferase (AST), alanine aminotransferase (ALT) and

γglutamyltranspeptidase (GGT) are indicators of hepatocellular injury. Increased activity of these markers is associated with insulin resistance¹⁴.

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health. People are generally considered obese when their body mass index (BMI), a measurement obtained by dividing a person's weight by the square of the person's height, is over 30 kg/m², with the range 25–30 kg/m² defined as overweight¹⁵.

Some East Asian countries use lower values¹⁶.

Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, obstructive sleep apnea, certain types of cancer, and osteoarthritis¹⁷.

MATERIALS AND METHODS

The sample size of the study was 60.

The study was carried out in M.V. Diabetic Center, Gopalapuram using 30 obese diabetic patients and 30 non-obese diabetic patients.

The BMI of the patients were measured and concentrations of albumin, alkaline phosphatase, gammaGT, globulin, SGOT, SGPT, total bilirubin and total protein were estimated to find the LFT levels of the two groups.

Thus the relationship between liver function and obesity were estimated.

Patients with only diabetics or a combination of diabetics and obesity were chosen, and patients with any other disorder were not taken into consideration.



RESULTS

The p values of albumin, alkaline phosphatase, globulin, total bilirubin, and total protein were calculated using Independent t-Test, while the p values of GammaGT, SGOT and SGPT were calculated using Mann-Whitney Test.

The values of albumin, gammaGT and globulin were statistically significant (p value<0.05). The values of alkaline phosphatase, SGOT, SGPT, total bilirubin and

total protein were not statistically significant (p value>0.05). The mean values of albumin, gammaGT and globulin in obese patients were 4.11, 36.43, 3.170 respectively and that in non obese patients were 4.30, 27.97, 2.953 respectively.

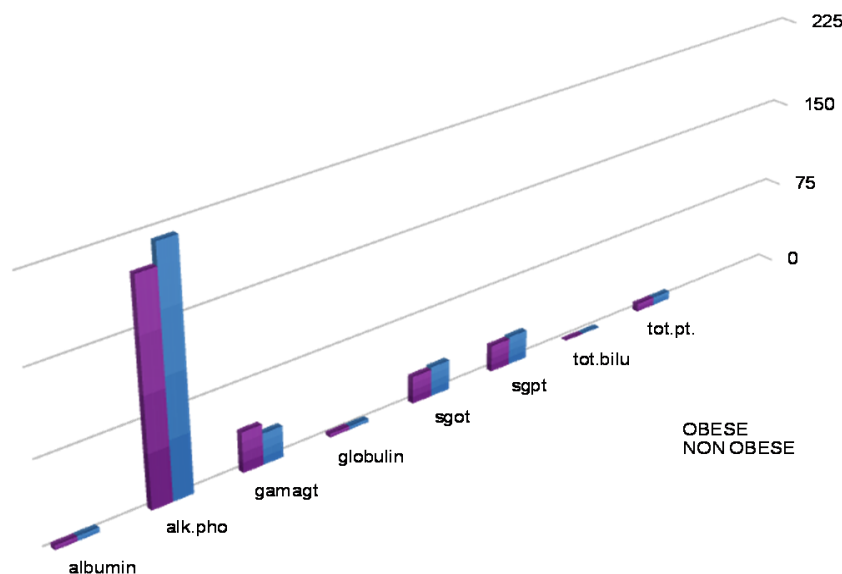


Figure 1: Levels of Liver Enzymes in Obese and Non Obese Patients.

Table 1: Mean, Standard Deviation and p-value of different Liver Enzymes.

	Obese		Non Obese		P Value
	Mean	Standard Deviation	Mean	Standard Deviation	
Albumin	4.11	0.322	4.30	0.289	0.019
Alkaline Phosphatase	197.83	55.472	217.20	99.259	0.355
GAMAGT	36.43	26.678	27.97	22.540	0.050
Globulin	3.170	0.4001	2.953	0.4208	0.046
SGOT	24.63	12.976	26.73	10.279	0.161
SGPT	23.87	12.703	25.63	14.001	0.539
Total Bilurubin	0.620	0.2250	0.623	0.2176	0.954
Total Protein	7.277	0.4599	7.250	0.3739	0.806

DISCUSSION

A few patients with IDDM had abnormal LFT results, whereas in the NIDDM patients, minor abnormalities in LFTs were fairly common. No previous reports on bile acids (BA) are available for comparison, but our findings regarding gGT and Alt agree with earlier data in diabetic subjects^{18,19}. Normally, 2.5-5% of the values obtained from a random, healthy population sample are expected to exceed the normal reference range for a particular test. In NIDDM, the percentages of abnormal CDCA, gGT, and Alt were higher than such expectations²⁰. In asymptomatic healthy adults, abnormal LFT has been

found in around 7 to 9% of cases without identifiable cause⁹. Values of the liver function tests in patients with type 2 diabetes mellitus were significantly higher than that of control. Moreover, patients had lower albumins in comparison to the control group and 22% of the patients had at least one or more elevated liver enzyme levels in the serum, and the entire patients had normal values of total protein and albumin concentrations²¹.

In this study, it is found that there were significant difference in the levels of albumin, gammaGT, and globulin. the levels of albumin was lowered in diabetic obese patients while the levels of gammaGT and globulin



were raised. There was no significant alteration in the levels of alkaline phosphatase, SGOT, SGPT, total bilirubin and total protein.

CONCLUSION

Thus, from this study we find that the LFT levels in diabetic patients were altered with obesity. The abnormalities of liver enzymes such as albumin, gammaGT and globulin were noted. Hence, obese diabetic patients have a higher risk of diseases associated with abnormal LFT levels.

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