

“Study on Serum lipid pattern in patients of liver cirrhosis: A Hospital Based Study”

Biochemistry

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ABSTRACT

Cirrhosis of the liver is a growing health problem in India and death from this condition is increasing rapidly among both men and women. Cirrhosis is a chronic disease of the liver in which diffuse destruction and regeneration of hepatic parenchymal cells, and diffuse increase in connective tissue result in disorganization of the lobular architecture. My aim was to determine levels of serum lipid profile in patients with liver cirrhosis. All the four variables (HDL-c, LDL-c, total cholesterol and TG) were significantly lower in cirrhotic patients than in the control group. There was a significant correlation between decrease in serum total cholesterol, HDL-c and LDL cholesterol level.

KEYWORDS:

Liver cirrhosis and Lipid profile (TC, TG, HDL-c & LDL-c).

Introduction:

Cirrhosis of the liver is a growing health problem in India and death from this condition is increasing rapidly among both men and women. Cirrhosis is a chronic disease of the liver in which diffuse destruction and regeneration of hepatic parenchymal cells, and diffuse increase in connective tissue result in disorganization of the lobular architecture.¹ Lipids are considered as one of the important biomolecules which control cellular functions and homeostasis and liver is an important site for metabolism of lipid. It contributes both in exogenous and endogenous cycles of lipid metabolism and transport of lipids through plasma.² In lipid transport, apolipoproteins which are synthesized in liver, function as structural components of lipoprotein particles. Apo lipoproteins mediate the transport and uptake of cholesterol and lipid by way of its high affinity interaction with different cellular receptors. Apo lipoproteins play important role in lipoprotein metabolism. Thus making liver as the principal site of formation and clearance of lipoproteins.³ This shows involvement of liver in many steps of metabolism and transport of lipid. Thus in severe liver disease, lipid metabolism is affected in variety of ways.

Cirrhosis of the liver is a result of advanced liver disease. Increase incidence of cirrhosis is found in the middle age group (35-45 yrs) individuals. It is characterized by replacement of liver tissue by fibrosis (scar tissue) and regenerative nodules (lumps that occur due to attempted repair of damaged tissue); and often areas of regeneration develop. The surviving cells multiply in an attempt to regenerate and form "islands" of living cells that are separated by scar tissue. These islands of living cells have a reduced blood supply, resulting in impaired liver function.⁴ Impaired function causes yellowish discoloration of skin, itching, easy bruising from decreased production of blood clotting factors etc. Cirrhosis of the liver results in gross distortion in liver architecture. Owing to reduced liver biosynthetic capacity, low levels of triglycerides (TG) and cholesterol are usually observed in chronic liver disease. Portal hypertension, hepatic encephalopathy hepatorenal syndrome, spontaneous bacterial peritonitis and esophageal variceal bleeding are the major complications of cirrhosis.⁵ Various hepatic parenchymal diseases result in alterations in lipoproteins structure and transfer through the blood.⁶ My aim was to determine levels of serum lipid profile in patients with liver cirrhosis.

Material and Methods:

The present study was conducted in the Department of Biochemistry, In association with Department of Gastroenterology, Hi-Tech Medical College & Hospital Rourkela, Odisha, India, during the period from September 2016 to March 2017. The study protocol was approved by the Ethics committee of HMCH, Rourkela. Randomly

selected, 25 cirrhosis patients admitted in Hi-Tech Medical College & Hospital, Rourkela along with 25 healthy controls were studied for following parameters⁷.

1. Total Cholesterol (TC) by enzymatic end point CHOD-POD methods.
2. Triglyceride (TG) by enzymatic glycerol phosphate oxidase/peroxidase methods.
3. HDL-Cholesterol by direct enzymatic end point method.
4. LDL-Cholesterol by Friedewald's formula.

The results obtained were statistically analysed by SPSS version 18 using student t-test and one way ANOVA.

Results and Discussion:

In the present study, a total of 25 cases and 25 controls were studied. Chart-1 shows the different cause of cirrhosis. Table-1 shows mean & S.D. of lipid profile in cirrhotic patients compared with the healthy controls. Dyslipidemia is a frequent finding in chronic liver disease. Dyslipidemia is also seen in other illnesses like Diabetes Mellitus and chronic renal failure etc. Many national studies are available regarding dyslipidemia in Diabetes Mellitus or Chronic Renal Failure.⁸

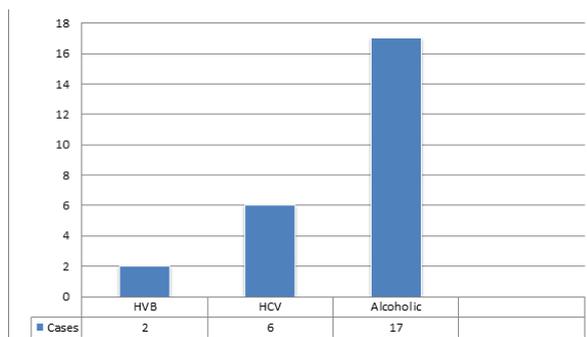


Fig 1: Causes of cirrhosis in patients:

Chronic liver disease causing disruption of liver tissue and hence derangement of lipid metabolism has been shown in various studies.⁹ Decreased levels of VLDL-c, total cholesterol, HDL-cholesterol were found in these patients. Our study showed that patients with liver diseases had lower lipid levels and all four parameters of lipid profile (HDL-c, LDL-c, total cholesterol and TG)

were significantly lower in patients with liver cirrhotic than in the control group. Besides, the amount of decrease in the serum HDL-c, LDL-c and total cholesterol was significant with increasing severity of liver damage. Liver cirrhosis treatment includes preventing further damage to the liver, treating its complications, preventing liver cancer or detecting it early and liver transplantation.

Table 2: Comparison of lipid profiles in cirrhotic patients in between Cases & control:

Lipid profile	Control (n=25) Mean±SD	Cases (n=25) Mean±SD
TC	190±46.69	142±21.31
TG	187.5±42.3	93±58.6
HDL-c	42.1±12.78	32.1±5.04
LDL-c	104.3±24.24	76.48±10.44

*Statistically significant (P-value <0.05)

This decrease in the serum total cholesterol and TG levels in patients with cirrhosis of liver compared with healthy control has been observed previously in many other studies, which is expected, as the synthetic functions of the liver are decreased. Study conducted by Perales et al³, have shown that in chronic liver disease condition without cholestasis; lipid profile i.e. LDL-c, HDL-c and VLDL-c levels significantly decrease and become worse as the disease progresses. This finding supports our observations that as the liver disease progresses the functioning of liver is affected adversely, causing low levels of LDL-c, HDL-c and total cholesterol in patients. Siagris et al¹⁰ from Greece found lower total cholesterol level in patients compared to the comparison group. According to Joel et al¹¹ most common cause of cirrhosis is alcoholism accounted for 60 to 70% of cases followed by HBV infection in 10% of cases. In our study 68% were alcoholic and 8% and 32% were having HCV and HBV infection respectively which is similar to the finding with Joel et al. In this study we observed decreased levels of total cholesterol, triglycerides, LDL-c and HDL-c in patients with liver cirrhosis. Other studies like Taylor et al¹² also show similar findings. Decrease in lipid levels is also observed in disorders like malabsorption, malnutrition, malignancy and hyperthyroidism. Hence the patients suffering from or diagnosed as having other concomitant illnesses should be excluded from the study.¹³ All the four variables (HDL-c, LDL-c, total cholesterol and TG) were significantly lower in cirrhotic patients than in the control group. There was a significant correlation between decrease in serum total cholesterol, HDL-c and LDL cholesterol level.

Conclusion:

This study of lipid profile in alcoholic and viral cirrhotic patients (carriers of hepatitis C virus) aids to identify the severity of liver damage. Isolated hypocholesterolemia contributes to evaluation of hepatic progression, due to association between the reduction of cholesterol and its fractions and clinical helps in diagnosis of severity of liver disease and also acts as a good prognostic sign. Lipid profile should be advised in all cases with advanced liver disease.

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