

## **Study of Lipid Profile in Cirrhosis of Liver Patients**

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### **Abstract**

Cirrhosis is defined anatomically as a diffuse process with fibrosis and nodule formation. It is the result of the fibrogenesis that occurs with chronic liver injury. For reduced liver biosynthesis capacity, low level of triglyceride and cholesterol is usually observed in the chronic liver disease. Due to the high prevalence of chronic liver disease in our country we have conducted this study to determine lipid profile in a patient with cirrhosis. Total 50 patients of liver cirrhosis either male or female and having age from 18-65 years were recruited. Fasting blood samples of all the patients were taken and sent to laboratory for lipid profile. Total Cholesterol, LDL-Cholesterol, VLDL-Cholesterol, HDL-Cholesterol, Triglycerides were low in cirrhosis patients as compared to normal control group. This difference was statistically highly significant. Dyslipidemia is a common finding in chronic liver disease. In chronic liver disease due to decreased biosynthetic capacity of liver unusually low level of cholesterol, triglyceride, HDL and VLDL found.

**Key words:** Lipid Profile, Liver Cirrhosis

### **Introduction**

Liver is the important organ in the homeostasis maintenance of lipid levels in the organism [1]. Consumption of alcohol can result in to fatty liver, alcoholic hepatitis and ultimately, alcoholic cirrhosis in some patients. In Western countries, alcohol has become the major culprit for the development of liver cirrhosis, and it is exponentially increasing in countries like Japan and India [2, 3]. Liver cirrhosis is the final result of chronic liver damage. Liver cirrhosis is characterized by parenchymal injury leading to extensive fibrosis and nodular regeneration. Data show that about 30% of the heavy drinkers liver cirrhosis. Several factors are responsible for this development including sex, obesity, drinking patterns, dietary factors, non-sex-linked genetic factors and cigarette smoking [4, 5] Lipids are essential component of biological membrane, free molecules and metabolic regulators that control cellular function and homeostasis. The liver plays a key role in the metabolism of plasma lipids and lipoproteins. It receives fatty acids and cholesterol from peripheral tissues and diet, packages them into lipoprotein complexes and releases these complexes back into circulation. Chronic liver disease due to various causes are often associated with reductions in plasma TG and cholesterol level due to reduced lipoprotein biosynthetic capacity. Lipoproteins are large

macromolecular complexes that transport hydrophobic lipids (primarily triglycerides, cholesterol, and fat-soluble vitamins) through body fluids (plasma, interstitial fluid, and lymph) to and from tissues. The triglycerides of VLDL are derived predominantly from the esterification of long-chain fatty acids in the liver. As with chylomicrons, the triglycerides of VLDL are hydrolysed by Lipoprotein lipase especially in muscle, heart, and adipose tissue. The cholesterol in LDL accounts for more than one-half of the plasma cholesterol in most individuals. Approximately 70% of circulating LDL is cleared by LDL receptor-mediated endocytosis in the liver.[6-11] Apart from the various complications seen in cirrhotic patients, chronic dyslipoproteinemia is one which can lead to alterations in cellular membrane lipids, that result in formation of abnormal RBCs, such as echinocytes, and alterations in membrane function with potential pathophysiologic consequences. There is prominent decline in plasma cholesterol and triglyceride (TG) levels in patients with severe hepatitis and hepatic failure because of reduction of lipoprotein biosynthesis. For reduced liver biosynthesis capacity, low levels of TG and cholesterol is usually observed in chronic liver diseases[12]. As there is a high prevalence of chronic liver disease in our country, we conducted this study to determine lipid profile in patients with cirrhosis.

## Material and Methods

This cross sectional study conducted at Department of Pathology in Medical College Hospital. Total 50 patients of liver cirrhosis either male or female and having age from 18-65 years were recruited. Written informed consent was taken from every patient. Patients with co-morbid diseases such as diabetes mellitus, hypertension and ischemic heart disease, patients on lipid lowering drugs or hepatotoxic drugs, patients with acute hepatitis, patients with end stage renal disease acute pancreatitis, recent parenteral nutrition and acute gastrointestinal bleeding, were excluded from the study. Fasting blood samples of all the patients were taken and sent to laboratory for lipid profile and findings were noted on pre-designed proforma along with demographic profile of the patients. All the collected data was entered and analyzed by using SPSS version 16. Mean and standard deviation was calculated for numerical variables and frequencies and percentages was calculated for categorical variable. Chi-square/fisher exact test was applied to see the level of significance. P. value  $\leq$  0.001 was considered as statistically highly significant.

## Results

**Table 1: Age groups of Cirrhosis Patients**

Age groups (Years)	Cirrhosis Patients n =50	Percentage
18-30	04	8 %
31-40	18	36 %
41-50	20	40 %
51-65	08	16 %

**Table 2 : Lipid Profile in Cirrhosis Patients and Control group.**

<b>Lipid Profile mg/dl</b>	<b>Cirrhosis Patients n=50 Mean± SD</b>	<b>Control Group n=50 Mean± SD</b>	<b>p value</b>
Total Cholesterol	142.42±15.44	166.34±13.2	<0.001
LDL-Cholesterol	80.46±14.8	96.64±13.2	<0.001
VLDL-Cholesterol	23.6±3.8	28.4±4.2	<0.001
HDL-Cholesterol	38.2.4±45.64	45.62±4.24	<0.001
Triglycerides	114.6±11.24	132.84±12.6	<0.001

Table 2 shows Total Cholesterol, LDL-Cholesterol, VLDL-Cholesterol, HDL-Cholesterol, Triglycerides were low in cirrhosis patients as compared to normal control group. This difference was statistically highly significant.

## Discussion

In our study, it was found that there was lower level of TC, TG, HDL, LDL, and VLDL in cirrhotic patients than non-cirrhotic (Control group). Hence, it revealed that all lipid parameters were statistically highly significantly lower ( $P < 0.001$ ) in cirrhotic patients. Hence, our study showed that there was decreased level of lipid in cirrhotic subjects. Cicognani et al., conducted study, serum lipid and lipoprotein patterns in patients with liver cirrhosis, and chronic active hepatitis, the results revealed that serum TC, HDL, and LDL-cholesterol were significantly lower ( $P < 0.001$ ) in cirrhotic patients as compared to control subjects.[13] Similar type of studies done by many authors and revealed results like our study, Ghadir et al., study showed that cirrhotic patients had lower levels of serum TC, TG, HDL, and LDL cholesterol in compared to non-cirrhotic patients and statistically significant ( $P < 0.05$ ).[14] These observations may be explained by the fact that in chronic liver disease unusually low levels TC, LDL, HDL, and TG are found due to decreased biosynthetic capacity of liver increase severity of liver disease. Chronic liver disease due to different reasons is commonly linked with dramatic decline in plasma TG and cholesterol levels which could be because of declined synthesis of lipoprotein.[15,16]

## Conclusion

Dyslipidemia is a common finding in chronic liver disease. In chronic liver disease due to decreased biosynthetic capacity of liver unusually low level of cholesterol, triglyceride, HDL and VLDL found. However, further studies are needed to assess the predictive value of dyslipidemia as a tool to forecast the progression of cirrhosis.

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