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ORIGINAL RESEARCH

Study of Lipid Profile in patients of Chronic Alcoholic Liver Disease

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Abstract

Background: Liver plays a vital role in lipid metabolism. It contributes both in exogenous and endogenous cycles of lipid metabolism and transport of lipids through plasma. Liver disease impacts on hepatic synthesis of lipoproteins and lipogenesis but data on dyslipidemia during disease progression are limited.

Aims & Objectives: To assess the serum Lipid profile in patients diagnosed with chronic alcoholic liver disease (ALD) in a tertiary care level hospital and to assess the association of Serum Lipid profile alterations with the severity of alcoholic liver disease.

Materials & Methods: The present study was conducted in the Department of Medicine, Dr Panjabrao Alias Bhausaheb Deshmukh Memorial Medical College and Research Centre, Amravati on 73 patients with chronic alcoholic liver disease and >18 years of age of both sex. Then they were subjected to Clinical data, including demographic information, medical history, liver function tests, imaging findings. Serum Lipid Profile Levels including triglycerides, cholesterol, and lipoproteins were measured using standardized laboratory assays, with values expressed in mg/dL. Disease severity was assessed using established scoring systems such as Child-Pugh classification.

Results: Mean S Cholesterol levels was 192±43.67 mg/dl,S triglyceride was 136.9±87.23 mg/dl,HDL was 31.4±11.76 mg/dl ,LDL was 92.58±32.64 mg/dl and VLDL was 27.54±14.12 mg/dl. One way Anova was applied which states that the S Cholesterol, Triglyceride and HDL had statistical significant difference among 3 groups with p value <0.05.

Conclusion: The severity of Chronic alcoholic Liver Disease increases from Child pugh score class A to Child pugh score class C, the lipid panel profile decreases exponentially

Keywords: Chronic liver Disease, Lipid Profile, Childpugh classification.

Introduction

Lipids are essential component of biological membranes, free molecules and metabolic regulators that control cellular function and homeostasis.[1] Liver plays a vital role in lipid metabolism. It contributes both in exogenous and endogenous cycles of lipid metabolism and transport of lipids through plasma. Dyslipidemia seen in chronic liver disease differs from that found in most of the other causes of secondary dyslipidemias because circulating lipoproteins are not only present in abnormal amount but they also frequently have abnormal composition,

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electrophoretic mobility and appearance.[2]
Chronic liver diseases due to various causes are often associated with dramatic reductions in plasma triglyceride and cholesterol level due to reduced lipoprotein biosynthetic capacity. Cholestasis is associated with hypercholesterolemia as the major excretory pathway of cholesterol is blocked in this disorder. 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.[3]
Several scoring systems have been developed to evaluate liver status as Child pugh score The rationale for this observational study is to understand the correlation between alcohol-induced liver damage and lipid metabolism in Alcoholic liver disease (ALD)

Aims & objectives

1. To assess the serum Lipid profile in patients diagnosed with chronic alcoholic liver disease (ALD) in a tertiary care level hospital.
2. To investigate the association between Serum Lipid profile alterations and the severity of alcoholic liver disease.

Materials & Methods

Study Design: Cross sectional study was conducted in the Medicine Department, of a tertiary care Hospital for a period of six months.

Sampling Technique: Convenience sampling was used.
Study population: 73 patients with confirmed Alcoholic Liver disease were included in our study as per inclusion /exclusion criteria

Inclusion Criteria

1. Adults aged 18 years and above.
2. Confirmed diagnosis of Alcoholic Liver Disease (ALD) based on clinical, biochemical, and imaging criteria.
3. Willingness to participate and provide informed consent.
4. Availability for follow-up assessments over the study period.

Exclusion Criteria

1. Individuals with liver diseases other than ALD.
2. History of liver transplantation.
3. Pregnancy or breastfeeding.
4. Concurrent use of medications known to impact lipid metabolism significantly.
5. Presence of significant comorbidities that may confound the relationship between ALD and lipid profiles.
6. Inability to adhere to study procedures or follow-up visits.

Sample size: Considering prevalence[5] of ALD – 10.9%, confidence interval 90% and error 6%, sample size is 73. This is calculated using open-epi-version 3.

Methodology

The patients were subjected to detailed history taking, clinical examination and relevant investigations as per case requirement using a Proforma specially designed for this study. Serum cholesterol and triglyceride levels were analysed by in vitro enzymatic colorimetric kit method. HDL estimation was done by enzymatic kit method after precipitation of serum by

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phosphotungstate and magnesium chloride. Clinical data, including demographic information, medical history, liver function tests, imaging findings. Disease severity was assessed using established scoring systems such as Child-Pugh classification.

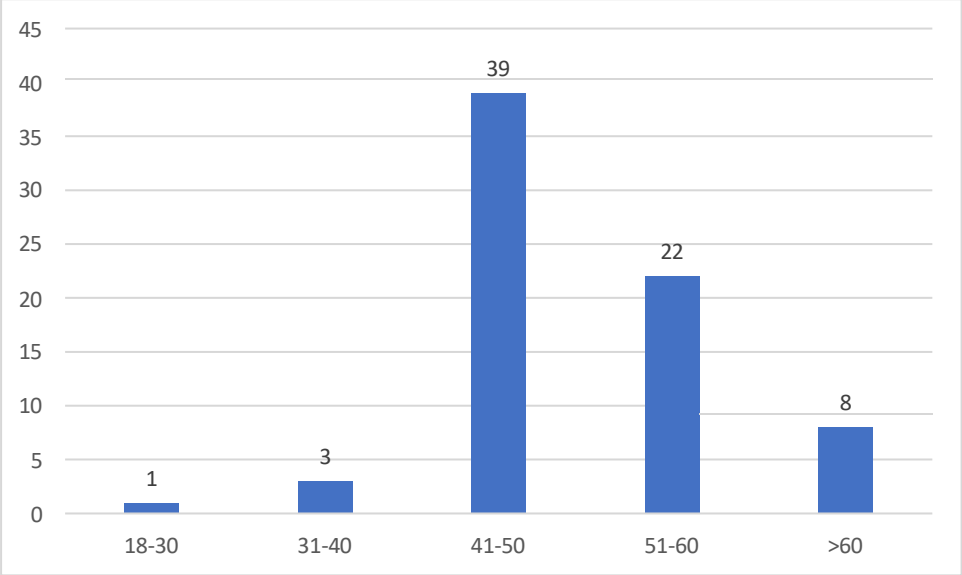
Results

TABLE 1: Age wise Distribution of Patients

Age in years	No.of patients	Percentage
18-30	01	1.36%
31-40	03	4.10%
41-50	39	55.42%
51-60	22	30.13%
>60	08	8.99%
Total	**73**	**100%**

Table 1 shows majority of patients 55.42% were in age group of 41-50 years, 30.13% i.e 22 were in age group of 51-60 years,08 patients were >60 years of age and 03 patients were in age group of 31-40years. Only 1 was in age group of 18-30 years. Mean age was 42.4 years.

Graph showing Agewise distribution



X axis-Age group Y axis-Number of cases

TABLE 2: Sex wise distribution

Sex	Number of patients	Percentage
Male	56	76.71%
Female	17	23.29%
Total	**73**	**100%**

Above table shows among 73 cases, majority of patients 17(23.29%) were females and rest 56(76.71%) were males.

TABLE 3: Lipid Profile in Alcoholic liver disease

Lipid profile	Mean(mg/dl)	Std Deviation(mg/dl)
S Cholesterol	192.5	43.67
S.Triglyceride	136.9	87.23
HDL	31.4	11.76
LDL	92.58	32.64

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VLDL	27.54	14.12

Mean S Cholesterol levels was 192±43.67 mg/dl,S triglyceride was 136.9±87.23 mg/dl,HDL was 31.4±11.76 mg/dl ,LDL was 92.58±32.64 mg/dl and VLDL was 27.54±14.12 mg/dl.

TABLE 4: Correlation of lipid profile with Child pugh score classification

Parameters	Child pugh score A (n=9)	Child pugh score B (n=38)	Child pugh score C(n=26)	P value
S Cholestrol	149.50±48.24	137.28±34.24	133.1±45.23	0.000
S.Triglyceride	135.27±28.43	103.2±29.32	115.9±54.13	0.001
HDL	33.53±12.63	31.87±12.22	35.07±13.8	0.000
LDL	90.67±32.32	89.35±38.37	79.04±34.76	0.090
VLDL	27.12±17.96	23.21±5.18	24.14±14.32	0.195

Mean S Cholesterol levels was 149.50±48.24 mg/dl in Child pugh score A, 137.28±34.24 mg/dl in Child pugh score B and 133.1±45.23 mg/dl in Child pugh score C grade.
S triglyceride was 135.27±28.43 mg/dl in Child pugh score A, 103.2±29.32 mg/dl in Child pugh score B and 115.9±54.13 mg/dl in Child pugh score C grade.
HDL was 33.53±12.63 mg/dl in Child pugh score A, 31.87±12.22 mg/dl in Child pugh score B and 35.07±13.8 mg/dl in Child pugh score C grade.
LDL was 90.67±32.32 mg/dl in Child pugh score A, 89.35±38.37mg mg/dl in Child pugh score B and 79.04±34.76 mg/dl in Child pugh score C grade.
VLDL was 27.12±17.96 mg/dl in Child pugh score A, 23.21±5.18 mg/dl in Child pugh score B and 24.14±14.32 mg/dl in Child pugh score C grade.
One way Anova was applied which states that the S Cholesterol,TG and HDL had statistical significant difference among 3 groups with p value <0.05.

Discussion

This study was conducted to assess the relation between the severity of Alcoholic liver disease and the lipid profile. In our study, all of the lipid markers were considerably greater in Child Pugh -A, followed by Child Pugh B, followed by Child Pugh C. These findings were in agreement with the previous studies; Muhammed et al stated that all parameters of lipid profile, including triglycerides, were significantly lower in cirrhotic patients and were inversely correlated with the severity of cirrhosis.[6]
Tauseef *et al*. also supported our results and concluded that the amount of decrements measured in the levels of serum total cholesterol, LDL, and HDL in patients with cirrhosis are related to the progress in cirrhosis.7
Salimoghlou et al found that HDL level is lower in Child-Pugh B than Child-Pugh A and apo-A level is the most affected factor in those with liver damage. [8] Perales and his colleagues showed that in chronic liver disease without cholestasis, there was a significant decline in lipid levels with the progression of disease process.[9]
Another observational study found that in patients with chronic liver disease LDL, HDL, and VLDL levels decline and become worse as the disease progresses, this finding positively correlate with our observational study that in severe liver disease as the liver function deteriorates, more decrease the TC, TG, HDL, LDL, and VLDL and concluded an obvious decline in TC level in patients with chronic liver disease in comparison with controls.[10]

Conclusion

The severity of Chronic Liver Disease increases from Child pugh score class A to Child pugh scoreclass C, the lipid panel profile decreases exponentially.

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Conflict of Interest
Nil

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