Original Research Article

STUDY OF LIPID PROFILE IN PATIENTS WITH NON-ALCHOLIC FATTY LIVER DISEASE

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ABSTRACT

Background: The term "non-alcoholic fatty liver disease" (NAFLD) refers to a group of illnesses brought on by an accumulation of fat in the liver. It typically manifests in individuals who are obese or overweight. Most of the time, early-stage NAFLD is harmless, but if it worsens, it can result in significant liver damage, including cirrhosis. Additionally linked to a higher risk of major health issues like diabetes, high blood pressure, and kidney disease are high liver fat levels. NAFLD increases the risk of heart problems if you already have diabetes. Early detection and treatment can prevent the progression of NAFLD and lower the amount of fat stored in the liver.

Aim and Objectives: To study the serum levels of lipid profile parameters in patients with Non-alcoholic fatty liver disease.

Materials and Methods: This study was prospective, observational, carried out in the Dept. of General Medicine in our tertiary care hospital, in which 150 individuals were included. The subjects' blood pressure and demographic data were collected, and a blood sample was ready for analysis to look into the subjects' lipid profile. $P < 0.05$ was deemed significant in the independent sample t-test.

RESULTS: NAFLD was correlated with a lipid profile that included fasting blood sugar (FBS), $P < 0.001$, triglyceride [TG], $P < 0.001$, total cholesterol [TC], $P = 0.007$, high density lipoprotein [HDL], $P < 0.001$, LDL-C/HDL-C (ratio), $P = 0.004$, and TC/HDL-C (ratio). Low-density lipoprotein [LDL] ($P = 0.80$) and age ($P = 0.37$), however, did not correlate.

CONCLUSION: Lipid profile parameters are linked to NAFLD. Thus, when patients exhibit changes that are detected by ultrasonography, it is advised to look into NAFLD in clinical settings.

Keywords: Lipid profile, non-alcoholic fatty liver disease (NAFLD), non NAFLD
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INTRODUCTION:

The non-alcoholic fatty liver disease (NAFLD) epidemic is a slowly progressing, mostly asymptomatic condition.[1] From simple steatosis to non-alcoholic steatohepatitis (NASH), advanced fibrosis, cirrhosis, and hepatocellular carcinoma (HCC), NAFLD encompasses a wide range of liver pathologies.[2] Over the past 20 years, the prevalence of NAFLD has doubled, while

the prevalence of other chronic liver diseases has stayed the same or even decreased.[3] The prevalence of non-alcoholic fatty liver disease (NAFLD) is approximately 25% worldwide,[4] 15–21% in non-obese Asian-Pacific individuals,[5] 30% in adult Americans, and 25% in Italy, according to reports.[6]

Abnormal liver tests, imaging studies, and liver biopsies are used to diagnose nonalcoholic fatty liver disease (NAFLD), which may eventually overtake all other causes in liver transplantation cases.[1] The most popular method for screening for fatty liver in the general population is liver ultrasonography.[6]

A frequent cause of patients visiting hepatology or gastroenterology clinics is elevated aminotransferase test results. As a result, transaminase values are given extra consideration these days, and anomalous aspartame transaminase (AST) and alanine transaminase (ALT) values are frequently used to diagnose NAFLD. [10,9] As a result, measurements of aminotransferases, blood lipids, and insulin resistance (IR) are frequently employed in clinical settings to identify NAFLD.[11,12]

AIM AND OBJECTIVES:
To study the serum levels of lipid profile parameters in patients with Non-alcoholic fatty liver disease(NAFLD) and non-NAFLD.

MATERIALS AND METHODS:
The study is carried out in the Department of General Medicine in our tertiary care hospital. We studied 150 cases of Fatty liver disease aged 35-60 years, which were then divided further into NAFLD & non-NAFLD. 100 subjects had NAFLD and 50 were having non-NAFLD.

The exclusion criteria for this study were not having viral hepatitis C or B, chronic or acute liver disease, cancers, alcohol consumption (more than 20 g/day for men and more than 10 g/day for women), pregnancy, taking liver-damaging medications like steroids, and patients with confirmed hemochromatosis.

This study was approved by the Institutional Ethics Committee.
All the subjects gave an informed consent before undergoing further investigations.

Study design: It is a prospective, cross sectional, hospital-based study.
Sample size: 150

RESULTS:
In this study, the mean age of the subjects was 47.7±7.5 years, and the mean FBS, systolic blood pressure (SBP), and diastolic blood pressure (DBP) was 103.85±30.5, 120.36±16.66 and 81.33±11.15, respectively [Table 2]

The results of mean of lipid profile of patients with NAFLD & non NAFLD is presented in [Table 1].

Table 1- All characteristics and parameters:

Variables	Mean ± SD (NAFLD) (no=100)	Mean ± SD (non-NAFLD) (no=50)	P-value
Age	49.27±7.7	47.86±6.22	0.37
Systolic BP	124.56±15.36	117.45±17.24	<0.001
Diastolic BP	83.73±10.51	80.15±10.55	<0.001
FBS (mg/dl)	110.64±28.5	96.23±26.8	<0.001
Triglycerides	202±91.2	153.48±85.15	<0.001
Total cholesterol	204.72±34.36	196.51±37.24	0.007
HDL-C	42.37±8.1	45.82±8.65	<0.001
LDL-C	122.3±26.75	121.45±27.63	0.80
LDL-C/HDL-C	3.10±0.6	2.95±0.71	0.004
TC/HDL-C	4.95±1.6	4.27±1.06	<0.001

FBS: Fasting blood sugar; HDL-C: high-density lipoprotein cholesterol; LDL-C: Low-density lipoprotein cholesterol

The total results of mean of lipid profile in combined NAFLD & non-NAFLD are below[Table 2]:

Table 2: Characteristics and parameters of combined NAFLD & non-NAFLD group:

Variables	Mean ± SD
Age	47.7±7.5
Systolic BP	120.36±16.66
Diastolic BP	81.33±11.15
FBS (mg/dl)	103.85±30.5
Triglycerides(mg/dl)	175±90.72
Total cholesterol	202.22±36.46
HDL-C(mg/dl)	44.37±8.7
LDL-C(mg/dl)	121.7±28.65
LDL-C/HDL-C	2.95±0.8
TC/HDL-C	4.85±1.4

The study's findings shows that there was a significant relationship ($P < 0.05$) between the likelihood of developing NAFLD and elevations of SBP, DBP, FBS, TC, TG, LDL/HDL ratio, and reduction of HDL. On the other hand, there was no significant difference in the levels of LDL (122.3±26.75vs. 121.45±27.63) between the groups.

DISCUSSION AND CONCLUSION:

As non-alcoholic fatty liver disease (NAFLD) lacks distinct clinical symptoms and is a silent illness, this study aims to describe the correlation between clinical and laboratory signs and NAFLD. Age and NAFLD do not significantly correlate, as stated by Pardhe et al. [16]. Consistent with the current study, Uppalapti et al. [17] reported findings from a study involving patients with diabetes. Nonetheless, it was noted by Navokovic et al.[18] and Swain et al.[10] that there is a substantial correlation between NAFLD and age. One known risk factor for NAFLD is dyslipidemia.

Comparing the NAFLD group to the non-NAFLD group in this study, the former had lower HDL and higher TC, LDL/HDL ratio, and TC/HDL ratio. Our findings are similar to the study done by Roya Mansour et al. [19] Novakovic *et al*.[18] in Serbia, compared chemical parameters with NAFLD and found that there is a significant relationship between TG, LDL, TC, and HDL, and an inverse relationship with HDL in the group. Ultrasonography can be used to make a preliminary diagnosis of NAFLD. It is possible to argue that the least expensive way to detect changes linked to NAFLD is through sonography that involves the fewest costs and complications.

Higher systolic and diastolic blood pressure was associated with an increased risk of developing non-alcoholic fatty liver disease (NAFLD) in the current study's NAFLD group, and a significant correlation between blood pressure and NAFLD was found. This outcome is consistent with several studies' findings.[2,16,18, 19]. The current study demonstrated a significant correlation between elevated FBS levels and an increased risk of developing NAFLD. This conclusion was also supported by studies conducted by Pardhe et al. [16], Jain et al. [2], and Roya Mansour et al. [19].

The study's findings showed that there are significant alterations in biochemical markers in NAFLD patients. Because early diagnosis both prevents and delays further complications, it appears imperative that sonography be used in clinical settings to examine individuals with NAFLD when biochemical and lipid changes are observed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest

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