Original Research

To determine the role of Lipid Profile in Patients with Non-Alcoholic Fatty Liver Disease

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ABSTRACT:
Aim: To determine the role of Lipid Profile in Patients with Non-Alcoholic Fatty Liver Disease. **Materials and methods:** A present prospective cross-sectional study was performed on 60 patients at the outpatient and inpatient department of medicine involving patients in the age group 18-70 years. NAFLD was diagnosed on basis of clinical history, laboratory findings, and radiological investigation at the study center.Non-alcoholic individuals, either total abstainers or who consumed <30 g of alcohol per day for men and <20 g of alcohol per day for women with elevated liver enzymes and ultrasound showing hyperechoic liver suggestive of fatty liver were included. Complete blood picture, fasting lipid profile, and age and gender were recorded. **Results:** Most of the patients were in the age group of 35 to 45 (51.67%) and 45 to 55(25%) years. NAFLD was more prevalent in the age group 45 to 55. The prevalence of NAFLD was considerably higher in females (60%) than in men (40%).The mean age of NAFLD patients was 44.17. Out of 60 NAFLD patients, 36 were females and 24 were males. NAFLD patients were found to have a significant correlation with abnormal LDL, TG, and TC levels. **Conclusion:** As a result of this study, it is possible to conclude that serum biochemical analysis is one of the least expensive modalities for detecting changes associated with NAFLD, and it also reduces the exposure of these patients to unnecessary, expensive, complicated, and time-consuming investigations.
Keywords: NAFLD, LDL, TG,TC

INTRODUCTION

Non-alcoholic fatty liver disease (NAFLD) is a leading cause of chronic liver disease worldwide, and it has recently emerged as a major cause of liver disease in India[1].NFALD affects all racial and ethnic groups and has no preference for age or gender. Epidemiological studies indicate that NAFLD affects between 9% and 32% of the general population in India[2].

NAFLD etiology reflects complex interactions between genetic, neurohumoral, metabolic, and stress-related factors that are more common in Asian countries. The liver is involved in lipid metabolic pathways by absorbing serum-free fatty acids, producing, storing, and transporting lipid metabolites[3].The presence of dyslipidemia (hypercholesterolemia, hypertriglyceridemia, or both) has been reported in 20% to 80% of NAFLD cases[4].

Liver fat content reflects the balance of free fatty acid flux via lipolysis, fatty acid oxidation, and de-novo lip genesis. Dyslipidemia in NAFLD patients is atherogenic, and the pathogenesis of NAFLD is characterized by the accumulation of lipids, primarily triglycerides, in hepatocytes[5].As a result, the current study investigated the relationship between laboratory lipid data and NAFLD to evaluate and confirm noninvasively the usefulness of serum lipid biochemistry and increasing the accuracy of NAFLD diagnosis.

MATERIALS AND METHODS

A present prospective cross-sectional study was performed on 60 patients at the outpatient and inpatient department of medicine involving patients in the age group 18-70 years. NAFLD was diagnosed on basis of clinical history, laboratory findings, and

radiological investigation at the study center.Non-alcoholic individuals, either total abstainers or who consumed <30 g of alcohol per day for men and <20 g of alcohol per day for women with elevated liver enzymes and ultrasound showing hyperechoic liver suggestive of fatty liver were included. Patients with alcohol consumption of ≥30 g/d for men and ≥20 g/d for women (as evident from patients' confession or interview of close relatives), positive hepatitis B surface antigen (HBsAg), positive antibodies to hepatitis C virus (anti-HCV), use of drugs such as amiodarone, corticosteroids, tamoxifen, methotrexate or high-dose estrogens, pregnancy, and imaging features of cirrhosis of the liver were excluded. Complete blood picture, fasting lipid profile, and age and gender were recorded. All the data analysis was performed using IBM SPSS ver. 20 software. Frequency distribution and cross-tabulation were used to prepare the tables. Microsoft office and PRISM software was used to prepare the graphs. Quantitative data were expressed as mean and standard deviation whereas categorical data were expressed as number and percentage. A Chi-square test was used to compare the percentage. A p-value of<0.05 is considered significant.

RESULTS

Most of the patients were in the age group of 35 to 45 (51.67%) and 45 to 55(25%) years. NAFLD was more prevalent in the age group 45 to 55. The prevalence of NAFLD was considerably higher in females (60%) than in men (40%).The mean age of NAFLD patients was 44.17. The mean age of NAFLD females and the male was 23 and 35 years, respectively.

Chi Square test is used to calculate P value. LDL: Normal; up to 130 mg/dL, Abnormal; more than 130 mg/dL, HDL: Normal; more than 50 mg/dL,Abnormal; Less than 40 mg/dL, TC: Normal; up to 200 mg/dL, Abnormal; more than 200 mg/dL, TG: Normal; up to 150 mg/dL, Abnormal; more than 150 mg/dL. LDL; low density lipoprotein, HDL; high density lipoprotein, TG; triglyceride, TC; total cholesterol.Table 1 shows the basic profile of NAFLD patients. Out of 60 NAFLD patients, 36 were females and 24 were males. NAFLD patients were found to have a significant correlation with abnormal LDL, TG, and TC levels.

Table 1: Basic profile of patients

Parameter	Number of patients=60	Percentage
Gender		
Male	24	40.00
Female	36	60.00
Age group (in years)		
18-25 years	5	8.33
25-35 years	9	15.00
35-45 years	31	51.67
45-55 years	15	25.00

Table 2: Distribution of lipid profile between gender

Lipid profile		Female with NAFLD (n=36)	Male with NAFLD (n=24)	Total (n=60)	Percentage	P-value
LDL	Normal	16 (44.44)	13 (54.17)	29	48.33	0.032
	Abnormal	20 (55.56)	11 (45.83)	31	51.67	
HDL	Normal	13 (36.11)	9 (37.5)	22	36.67	0.442
	Abnormal	23 (63.89)	15 (62.5)	38	63.33	
TG	Normal	2(5.56)	6 (25)	8	13.33	0.024
	Abnormal	34 (94.44)	18 (75)	52	86.67	
TC	Normal	14 (38.89)	14 (58.33)	28	46.67	0.008
	Abnormal	22 (61.11)	10 (41.67)	32	53.33	

DISCUSSION

NAFLD is a separate hepatic entity that is characterized by abnormal fat deposition in liver cells causing chronic liver disease. NAFLD prevalence is very high around the world in all age groups especially in middle age group individuals[6].In our study, most of the patients were in the age group of 35 to 45 (51.66%). Our results revealed that the prevalence of NAFLD had a significant correlation with age. It was more prevalent in the age group 45 to 55. This result is consistent with Khammasetal[7]and AlamS et al[8]. Khammas et al suggested that with an increase in age there is an increase in the prevalence of NAFLD, the highest peak observed between ages group of 52 years and 60 years; after 60 years the prevalence decreases[7].Alam S et al reported that younger age group people are less prone to have NAFLD, and as the age increases, the risk of developing NAFLD increases in each decade from 25 years to 54 years. In their study, they found that individuals of age between 45 to 55 years are at the highest risk of having NAFLD prevalence being 55.38%. Similarly, the risk of developing NAFLD decreases in patients with an age ofmore than 55

years[8].Duseja et al found that NAFLD had a high prevalence in the age group of 18–30 years that is 41.7%. 9 Our findings are also per a study by Hu et al, where NAFLD had a high prevalence of 26.4% and 26.3% in the 30–40 years and 50–60 years age group, respectively[10].NAFLD occurs in all age groups. The liver regulates alcohol metabolism, and as the body ages, toxicity elevates resulting in increased organ damage. These events are related to a mitochondrial transport flaw rising with an increase in age and decrease in the smooth endoplasmic reticulum and metabolism of CYP2E1- dependent microsomal ethanol oxidation functions.The mean age of NAFLD patients was 44.17. The mean age of NAFLD females and the male was 23 and 35 years, respectively. Duseja A et al reported that the mean age of individuals having NAFLD population was 30.7 years for males and 44.7 years for females[9]. In our study prevalence of NAFLD was considerably higher in females (60%) than in men (40%). Similarly, in Almobarak et al study, female patients were having a higher prevalence of NAFLD in almost all age groups than male patients[11]. Ahmed MH et al that both males and females had an equal prevalence of NAFLD[12]. On the other hand, Khammas et al found out that NAFLD had more prevalence in men than women. In both sexes, the prevalence was increased with age even after reaching the highest peak between ages 52 and 60 years and then it declined over 60 years[7].Lipid profile includes TG, HDL-C, and LDL-C, which are measured from lipid profile tests. Cholesterol is one type of blood lipids that is essential to construct estrogen and other sex hormones. It also synthesizes vitamin D so that it is considered a necessary item in body organisms. Now several sources of Red meats such as lamb and beef as well as many dairy products are considered main sources for cholesterol. HDL-C and LDL-C are termed as good and bad cholesterol, respectively because HDL-C is known to lower the risk of CVD and metabolic syndrome by routing cholesterol back to the liver and thereby preventing cholesterol synthesis in the arteries so to prevent atherosclerosis, that's why it is known as good cholesterol, whereas LDL-C is known to increased risk of CVD and metabolic syndrome by deposition of cholesterol in the arteries and causing atherosclerosis that's why it is called as bad cholesterol. TG is yet another type of lipid that is known to store energy from food[13].In the current study lipid profile test showed that in NAFLD patients, 48.33% had normal LDL and 51.67% had abnormal LDL, 36.67% had normal HDL and 63.33% had abnormal HDL, 13.33% had TG in the normal range and 86.67% had abnormal TG and 46.67% had normal TC and 53.33% had abnormal TC. Our findings correlate with Bandarua et al study, where hypercholesterolemia in 64.4%, high LDL in 35.5%, high triglycerides in 31 (40.7%), and low HDL in 36.8% in patients with NAFLD [14]. Khammas et al study found out that hypertriglyceridemia and low

HDL-C were linked with NAFLD patients, whereas hypercholesterolemia and high LDL-C were not found to have any association with NAFLD. [7]Agrawal et al found out in their study that,21.8% of subjects were having hypercholesterolemia, 45.16% subjects were having low HDL, 25% subjects were having high LDL, 56.5% subjects were having elevated VLDL, and 63.7% subjects were having hypertriglyceridemia, which is associated with NAFLD[15].Jali MV et al found out in their study that, 52% of subjects with NAFLD were having hypercholesterolemia, 27% subjects had low HDL levels, 59% subjects were having high levels of LDL, and 67% subjects were having high levels of triglycerides[16].Duseja A et al found out in their study that in 32% of patients having hypercholesterolemia and 79 (63.7%) patients had hypertriglyceridemia[17].

CONCLUSION

NAFLD is more prevalent in working-age females (35 to 45 years) than men. The risk of NAFLD was more with abnormal LDL, TG, and TC levels. Early detection of dyslipidemic patients with simple noninvasive biochemistry is extremely beneficial. As a result of this study, it is possible to conclude that serum biochemical analysis is one of the least expensive modalities for detecting changes associated with NAFLD, and it also reduces the exposure of these patients to unnecessary, expensive, complicated, and time-consuming investigations.

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