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Research Article

A retrospective study on lipid profile of patients having non-alcoholic fatty liver disease diagnosed by ultrasound in a tertiary care hospital

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Abstract:

Objective: To assess the lipid profile and body mass index (BMI) of the patients suffering from NAFLD in a north Indian population.

Methods: This was a hospital based cross-sectional study conducted in a tertiary care hospital in north, India. All the ultrasound proven fatty liver cases without hepatitis, history of no alcohol intake and not on any lipid lowering medicine were included in the study. The patients with very low and high BMI, having diabetes and hypertensive were excluded from the study. A total of 128 patients were included in the study. The age, sex, height and weight were recorded. A detailed clinical history for all the patients was taken and careful general examinations were done. Ultrasonographic (US) examination of all the patients was done for diagnosing and classifying grades of fatty liver grades.

Results: The mean age of the patients was 48.78±14.23 years and 45.3% of the patients were males. The mean BMI was 30.34±2.34. Increased levels of total cholesterol, triglyceride, LDL and VLDL were observed among NAFLD patients. HDL was found to be decreased among NAFLD patients. Majority of the patients were in Grade 0 (43.8%) followed by Grade I (32%), Grade II (17.2%) and Grade III (7%). Grade 0 fatty liver was higher among females (53.6%) than males (46.4%). Grade I fatty liver was also higher among females (58.5%) compared to males (41.5%).

Conclusion: The study found abnormal profile of lipid levels amongst patients with fatty liver. A case-control study is recommended to find better understanding of lipid levels among NAFLD subjects.

Key Words: Non-alcoholic fatty liver disease, lipid profile, Ultrasonographic.

INTRODUCTION

Non-alcoholic fatty liver disease (NAFLD), is now considered to be the commonest liver problem in the western world affecting 15-40% of the general population (Farrell and Larter, 2006). Non-alcoholic fatty liver disease is increasingly being recognized as a major cause of liver-related morbidity and mortality (Gaharwar et al, 2015). Because of its potential to progress to cirrhosis and liver failure, interest in this disease is increasing among researchers and clinicians in the relevant basic and clinical science fields.

The pathologic picture of non-alcoholic fatty liver disease, ranging from simple steatosis to steatohepatitis, advanced fibrosis, and cirrhosis, resembles that of alcohol induced liver disease, but it also occurs in patients who do not abuse alcohol (Gaharwar et al, 2015). Nonalcoholic steatohepatitis that is characterised by hepatic steatosis, liver cell injury, hepatic inflammation, fibrosis and necrosis is believed to be an intermediate stage of non-alcoholic fatty liver disease (Angulo, 2002). A NAFLD classification system (grade 0 to grade 3) has been proposed that correlates certain histologic features with the long-term prognosis (Pierre, 2013; David et al, 2005).

Most patients with NAFLD have no symptoms or signs of liver disease at the time of diagnosis, although many patients report fatigue or malaise and a sensation of fullness or discomfort on the right side of the upper abdomen. Hepatomegaly is the only physical finding in most patients (Obika and Noguchi, 2012).

The objective of the present study was to assess the lipid profile and body mass index (BMI) of the patients suffering from NAFLD in a north Indian population.

MATERIAL AND METHODS

The study was approved by the Ethical Committee of the Institute. This was a hospital based cross-sectional study conducted in a tertiary care hospital in north, India. All the ultrasound proven fatty liver cases without hepatitis, history of no alcohol intake and not on any lipid lowering medicine were included in the study. The patients with very low and high BMI, having diabetes and hypertensive were excluded from the study. A total of 128 patients were included in the study. The age, sex, height and weight were recorded. A detailed clinical history for all the patients was taken and careful general examinations were done. Ultrasonographic (US) examination of all the patients was done for diagnosing and classifying grades of fatty liver grades. The grading was done as normal US, Grade-I: fine diffuse increase in echogenicity of liver texture, Grade-II: diffuse increase coarse echogenicity of liver texture with mild attenuation of US's sound beams, Grade-III: diffuse increase coarse echogenicity of liver texture resulting in poor visibility of portal vein radical walls and right hemi diaphragm. BMI was calculated by using the formula [weight (kg)/height (meter^2)]. Lipid profile such as total cholesterol, serum triglycerides, serum high-density lipoprotein (HDL), serum low density lipoprotein (LDL) and serum very-low density lipoprotein (VLDL) was measured. Informed consent was taken from each of the patients before including them in the study.

RESULTS

The mean age of the patients was 48.78±14.23 years and 45.3% of the patients were males. The mean BMI was 30.34±2.34 (Table-1).

Table-1: General characteristics of NAFLD patients

General characteristics	(n=128)
Age in years	48.78±14.23
Male gender	58 (45.3%)
Height in cms	161.79±10.45
Weight in kgs	66.33±11.34
BMI kg/mtr^2	30.34±2.34

Values are in either mean±SD or percentages

Increased levels of total cholesterol, triglyceride, LDL and VLDL were observed among NAFLD patients. HDL was found to be decreased among NAFLD patients (Table-2)

Table-2: Lipid levels of NAFLD patients

Lipid profile	Mean±SD (n=128)
Total cholesterol	192.44±68.70
Triglyceride	145.34±76.89
HDL	42.55±13.25
LDL	110.14±34.55
VLDL	31.45±15.46

Majority of the patients were in Grade 0 (43.8%) followed by Grade I (32%), Grade II (17.2%) and Grade III (7%) (Table-3).

Table-3: Grade of fatty liver

Grade of fatty liver	No. (n=128)	%
Grade 0	56	43.8
Grade I	41	32.0
Grade II	22	17.2
Grade III	9	7.0

Grade 0 fatty liver was higher among females (53.6%) than males (46.4%). Grade I fatty liver was also higher among females (58.5%) compared to males (41.5%). However, Grade II fatty liver was found to be higher among males (54.5%) than females (45.5%) (Table-4).

Table-4: Grade of fatty liver according to gender

Grade of fatty liver	No. of patients	Male		Female	
		No.	%	No.	%
Grade 0	56	26	46.4	30	53.6
Grade I	41	17	41.5	24	58.5
Grade II	22	12	54.5	10	45.5
Grade III	9	3	33.3	6	66.7

DISCUSSION

The present study attempted to describe the abnormality of lipid levels among the patients of NAFLD in north Indian setting. A total of 128 non-diabetic, non-alcoholic subjects of both sexes free from hepatitis participated in the present study. In the present study, male sex were lower than females which is contradictory to the study by Acharya (2005) who reported the male predominance 91% males in his study. This difference may be due to that in our setting the alcohol pattern are more prevalent among males than females.

In the present study, the total cholesterol, triglycerides, LDL and VLDL was higher. In an Indian population, the subjects with NAFLD had significantly higher values of total cholesterol and triglycerides than controls (Sathiaraj et al, 2011). Bajaj et al (2009) had also reported that the subjects with NAFLD had significantly higher values of total cholesterol and serum triglycerides.

Increased lipid profile among NAFLD subjects had been reported in many studies. Clark (2006) in USA in a cross-sectional study found that NAFLD subjects were higher in high triglycerides levels. In another cross-sectional study in Brazil, subjects with NAFLD had a higher triglyceride (Leite et al, 2009). However, Lizardi-Cervera et al (2005) in Mexico found that the high level of cholesterol was found in 63% of the NAFLD subjects.

Leite et al (2009) in a cross-sectional study in Brazil found that subjects with NAFLD were more obese. Similarly, Clark (2006) in USA in a cross-sectional study also found that NAFLD was higher in high BMI. The findings of these studies are similar to this study.

A limitation of this study is that the diagnosis of NAFLD was based on ultrasonography and was not confirmed by liver

biopsy as well as lack of controls to investigate the risk of NAFLD. Ultrasonography is by far the commonest method of diagnosing NAFLD in clinical practice.

CONCLUSION

The study found abnormal profile of lipid levels amongst patients with fatty liver. A case-control study is recommended to find better understanding of lipid levels among NAFLD subjects.

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