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Original Research Article

Study of Non-Alcoholic Fatty Liver Disease in Chhattisgarh Population

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Abstract

Background: Non-alcoholic fatty liver disease is a spectrum of disorders defined by excess accumulation of triglyceride within hepatocytes, which may cause multiple abnormalities like visceral obesity, dyslipidemia, diabetes, hypertension, and cardiovascular diseases.

Method: 60 (sixty) NAFLD Patients were studied for USG lipid profile, HbA1C, routine blood examination, blood pressure recorded by sphygmomanometer, and ECG recorded (if necessary) to rule out cardiac co-morbidities.

Results: 12 (20%) were grade I, 28 (46.6%) had grade II, 20 (33.3%) had grade III NAFLD, and BMI was 22.8 to 23.2 in 38 (63.3%) and 23.3 to 24.2 in 22 (36.6%). 22 (36.6%) were pre-diabetic, 38 (63.3%) were diabetic, 16 (26.6%) were normotensive, 44 (73.3%) had HTN, 17 (28.3%) had IHD, and 3 (5%) had MI and elevated biochemical profiles.

Conclusion: It is observed that 3rd grade NAFLD among type II DM and hyperlipidemia have a high risk of morbidity and mortality. Such patients must be treated efficiently.

Keywords: grades of NAFLD, USG, hypertensive, type II DM, dyslipidemia.

Introduction

Non-alcoholic fatty liver disease (NAFLD) is a spectrum of disorders defined by excess accumulation of triglyceride within hepatocytes, ranging from simple steatosis, which is often clinically stable, to non-alcoholic steatohepatitis (NASH), which may progress to cirrhosis in the majority of patients [1]. Fat accumulation in the liver exceeds 5% to 10% of its weight. Fatty liver disease has frequent abnormalities involving insulin resistance, visceral obesity, dyslipidemia, diabetes, and hypertension [2]. NAFLD encompasses disorders ranging from simple steatosis to inflammatory steatohepatitis (NASH) and cirrhosis [3]. The diagnosis of cirrhosis may suggest the need for an assessment of any associated complications, such as esophageal varices or hepatocellular carcinoma. NAFLD associated with type-II diabetes mellitus may be a marker of cardiovascular diseases, and type-I diabetes mellitus is due to a lack of insulin resistance, which results in morbidity and mortality [4]; hence, an attempt is made to evaluate the grades of NAFLD and associated clinical manifestations with a biochemical profile.

Material and Method

60 (sixty) patients who visited the medicine department of Raipur Institute of Medical Sciences (RIMS), Godhi, Raipur, Chattisgarh-492101, were studied.

Inclusive Criteria: Patients aged between 30 to 65 years with symptoms of hepatic steatosis, cirrhosis of the liver, and diabetes mellitus who gave their consent in writing were selected.

Exclusion Criteria: Alcoholics, those with hemochromatosis, hydatid cysts, the presence of HBsAg, and immunocompromised patients were excluded from the study.

Method: Every patient underwent a USG, routine blood examination, lipid profile, HBSAg, and BMI. A detailed history of every patient was recorded. The ECG was recorded (if required). Blood pressure was recorded with a sphygmomanometer. The duration of the study was from March 2025 to August 2025.

Statistical analysis: Various grades of fatty liver, clinical manifestations, and biochemical profiles were classified by percentage. The statistical analysis was carried out using SPSS software. The ratio of males and females was 2:1.

Observation and Results

Table 1: Study of grade of non-alcoholic fatty liver Grade-I 12 (20%), grade-II 28 (46.6%), grade-III, 20 (33.3).

Table 2: Clinical manifestations of non-alcoholic fatty liver

1. Body mass index (BMI): 38 (63.3%) had 22.8 to 23.2 and 22 (36%) had 23.3 to 24.2.
2. Status of type II DM: 22 (36.6%) were pre-diabetic, 38 (63.3%) were diabetic.
3. Status of Blood Pressure: 16 (26.6%) were normotensive, 44 (73.3%) were hypertensive.
4. Hyperlipidemic: 45 (75%)
5. Ischemic heart disease (IHD): 17 (28.3%)
6. Myocardial infarction: 3 (5%).

Table 3: Biochemical profile of non-alcoholic fatty liver patients total cholesterol 224 (± 4.6), triglyceride 249 (±8.5), HDL 42.5 (± 2.5), LDL 126 (±9.6), ALT 66.4 (±3.5), ALP 10.3 (2.5), Serum Bilirubin 3.45 (± 0.10), Total bilurubin 0.92 (± 0.60), Fasting blood sugar was 132 ((± 10.3), HbA1c 9.8 (± 3.2).

Table 1: Study of grades of Non-Alcoholic Fatty liver (Number of patients: 60)

Sl. No	Grades of NAFLD	No. of patients (60)	Percentage (%)
1	Grade-I	12	20
2	Grade-II	28	46.6
3	Grade-III	20	33.3

Figure 1: study of grades of non-alcoholic fatty liver

Table 2: Clinical manifestations of Non-Alcoholic fatty liver (Number of patients: 60)

Sl. No	Clinical Manifestation	No. of Patients (60)	Percentage (%)
1	Body Mass Index (BMI) a-22.8 to 23.2	38	63.3
	b-23.3 to 24.2	22	36.6
2	Status type-II DM a – Pre-diabetic	22	36.6
	b – Diabetic	38	63.6
3	Status of Blood Pressure a – Normotensive	16	26.6
	b – Hypertensive	44	73.3
4	Hyper-lipidemic	45	75
5	Ischemic Heart Disease (IHD)	17	28.3
6	Myocardial Infarction (MI)	3	5

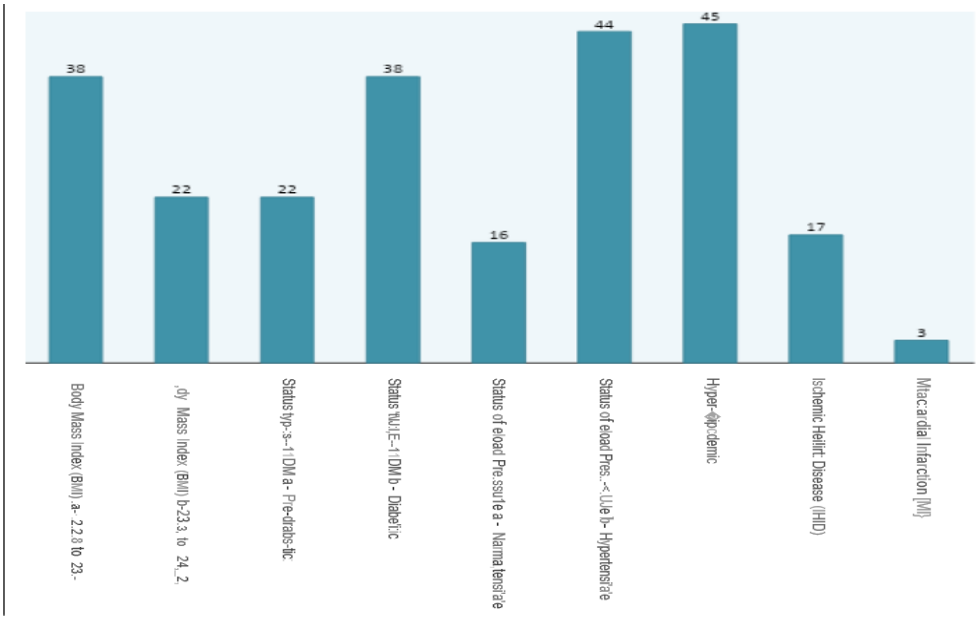

Figure 2: Clinical manifestations of Non-Alcoholic fatty liver

Table 3: Biochemical profile of Non-Alcoholic Fatty liver

Sl. No	Biochemical profile	Mean Value (±SD)
1	Total Cholesterol	224 (± 4.5)
2	Triglyceride	249 (± 8.5)
3	HDL	42.6 (± 2.5)
4	LDL	126 (±9.6)
5	AST	52.3 (± 3.2)
6	ALT	66.4 (±3.6)
7	ALP	10.3 (±2.6)
8	Serum Albumin	3.46 (±0.10)
9	Total Biliurubin	0.92 (±0.60)
10	Fasting Blood Sugar	132 (±10.3)
11	Hbs A1C	9.8 (±3.2)

ALP = Alkaline Phosphatase, ALT = Alanine amino transferase LDL = Low Density Lipoprotein, HbA1c = Glycosylated Haemoglobin AST = Aspartate Amino transferase

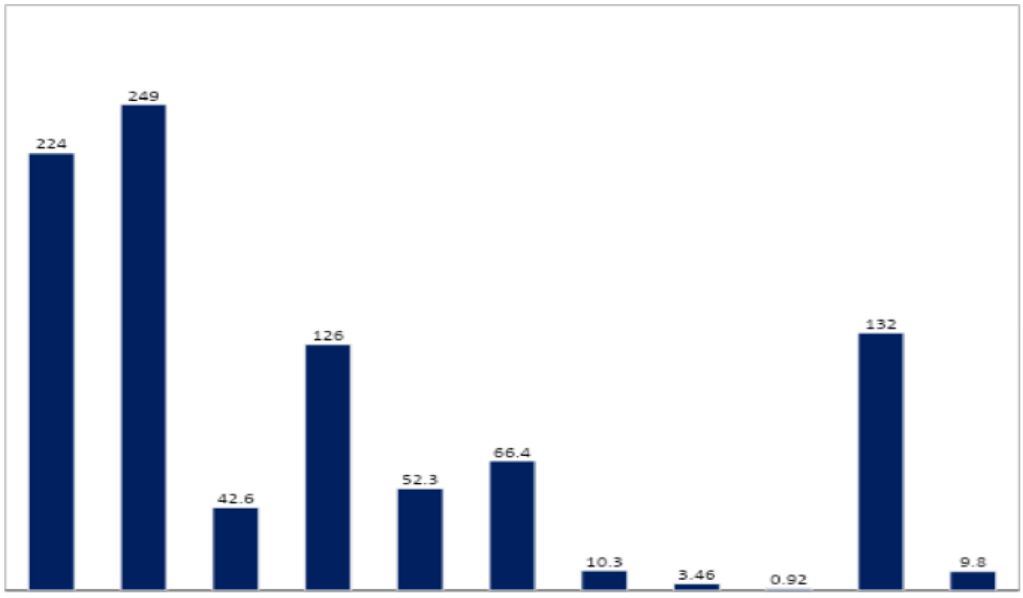

Figure 3: Biochemical profile of Non-Alcoholic Fatty liver

Discussion

In the present study of NAFLD in the Chhattisgarh population, out of sixty patients, 12 (20%) had grade-I, 28 (46.6%) had grade-II, and 20 (33.3%) had grade-III NAFLD (Table 1). The clinical manifestations were BMI 22 to 23.2 in 38 (63.3%), 23.3 to 24.2 in 22 (36.6%), 22 (36.6%) were pre-diabetic, 38 (63.3%) were diabetic, 16 (26.6%) were normotensive, 44 (73.3%) were hypertensive (HTN), 17 (28.3%) had ischemic heart disease, and 3 (5%) had myocardial infarction (Table 2). An elevated biochemical profile was noted in NAFLD patients (Table 3). These findings are more or less in agreement with previous studies [5,6,7].

NAFLD is associated with metabolic syndrome, which is characterized by insulin resistance, HTN, cholesterol abnormality, increased risk of blood clotting, type-II DM, obesity, elevated serum triglyceride, and reduced HDL, which has a greater risk of heart diseases, stroke, and liver-related diseases [8]. Although the exact cause of NAFLD is still unclear, it is associated with variations in lipid metabolism [9]. It is also reported that NAFLD is the common cause of chronic liver diseases or chronic viral hepatitis [10]. The histological spectrum of NAFLD has no pathological changes that can definitively distinguish NAFLD from alcoholic liver diseases; thus, accurate alcohol history is essential to diagnose alcoholic liver disease. Insulin resistance factor is believed to play a significant role that leads to increased lipolysis in peripheral adipose tissue and increased uptake of fatty acids by hepatocytes. The end result is an increase in fatty acids and triglycerides in the hepatocytes, leading to steatosis. Hence, insulin resistance is almost a universal factor in patients with NAFLD and is related to an imbalance between pro-insulin (adiponectin) and anti-insulin cytokine (TNF-a) [11,12]. It is also reported that the high prevalence of NAFLD is due to rapid industrialization, sedentary lifestyles, obesity, type-II DM and junk-food intake in developing countries.

Summary and Conclusion

The present study of NAFLD is associated with obesity, diabetes, and metabolic syndrome, which are the major causes of morbidity and mortality because simple steatosis carries a benign prognosis but, in the majority of cases, will have hepatocellular carcinoma. Although liver biopsy remains the gold standard for disease assessment, the development of risk scores and biomarker panels present study demands further pathophysiological, genetic, nutritional, environmental, and hormonal demands because the exact pathogenesis of NAFLD is still unclear.

Limitation of study: Due to the remote location of the research center, the small number of patients, and the lack of the latest techniques, we have limited findings and results.

This research paper has been approved by the ethical committee of Raipur Institute of Medical Sciences (RIMS), Godhi, Raipur, Chattisgarh-492101.

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