Indian Journal of Public Health Research and Development
Volume 14 No. 1, January-March 2023

Study of Non-Alcoholic Fatty Liver Disease in Maharashtra Population

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How to cite this article: Sayyed Sammiyodhin Gous. Study of Non-Alcoholic Fatty Liver Disease in Maharashtra Population. Indian Journal of Public Health Research and Development 2023;14(1).

Abstract

Background: NAFLD has become most prevalent cause of liver disease globally. Non-alcoholic steatohepatitis and fibrosis causes increased risk of cardio vascular and liver related deaths.

Method: Patients aged between 25 to 65 were studied. USG, lipid profile, BMI, HbA_1C, routine blood exam. Blood pressure was recorded by sphignomanometer; ECG was recorded if necessary to rule out the grades of NAFLD with CV diseases.

Results: 19 (21.2%) grade-I, 40 (44.4%) grade-II, 31 (34.4%) grade-III, NAFLD. 54 (60%) had BMI, 22.8 to 23.2 36 (40%) had BMI, 36 (40%) 23.3 to 24.2, 55 (61.1%) were Diabetic, 67 (74.4%) were Hypertensive, 66 (73.3%) were hyperlipidemic, 25 (27.7%) had IHD, 5 (5.5%) had MI, All patients had significant biochemical profile.

Conclusion: Evaluating the grades of NAFLD by radiological with biochemical laboratory techniques have greater significance to avoid morbidity and mortality to patients of NAFLD without liver biopsy.

Keywords: NAFLD, USG, Biochemical, BMI, NASH

Introduction

Non-Alcoholic Fatty liver disease (NAFLD) encompasses a spectrum of disease ranging from simple steatosis to inflammatory steatohepatitis (NASH) with increasing levels of fibrosis and ultimately cirrhosis [(1)]. NAFLD is closely associated with obesity and insulin resistance and now it is reported that NAFLD represent hepatic manifestation of metabolic syndrome [(2)]. Prevalence of NAFLD is closed associated with obesity and diabetes and most common cause of liver disease globally [(3)(4)].

Prevalence of NAFLD is estimated to be between 20% to 30% and 90% in obese globally. It is also observed that, just simple steastosis, with no inflammation or fibrosis is associated with liver related mortality. Hence attempt is made to evaluate the MI and various clinical manifestation with biochemical analysis to correlate the NAFLD so that, types and grades of NAFLD can be differentiated to avoid worse clinical outcome [(5)].

Material and Method

90 (Ninety) patients regularly visited to Medicine department of JUIUS Indian Institute of Medical Science and research Warudi, Badnapur (Tq), Jalna

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(dist) Maharashtra-431202 hospital were studied.

Inclusive Criteria: Patients aged between 20 to 65 years having the symptoms of hepatic steatosis, cirrhosis of liver with Diabetic mellitus were selected for study.

Exclusion Criteria: Alcoholic, haematchromatosis, hydatid cyst presence of HBSAg, HIV positive were excluded from the study.

Method

USG, routine blood examination, lipid profile HbA1C, BMI profile carried out in every patient. Concerned previous history was also recorded from every patient. ECG was recorded in patient (if required). Blood pressure was recorded from spignomanometre.

Duration of study was from October-2021 to June-2022

Statistical analysis: Grades of fatty liver, various clinical manifestations, Bio-chemical profile was classified with percentage. The statistical analysis was carried out in SPSS software. The ratio of male and female was 2:1.

Observation and Results

Table-1: Study of grades of NAFLD 19 (21.1%) had grade-I, 40 (44.4%) had grade-II, 31 (34.4%) had grade-III.

Table-2: Clinical manifestations of NAFLD

- Body Mass Index – (a) 54 (60%) had 22.8 to 23.2, (b) 36 (40%) had 23.3 to 24.2
- Diabetes Mellitus status – 33 (38.8%) were pre-diabetic, 55 (61.1%) were diabetic
- Status of Blood pressure – 23 (25.5%) were Norma tensive, 67 (74.4%) were hypertensive
- 66 (73.3%) were hyper-lipidemic
- 25 (27.7%) had IHD
- 5 (5.55%) had MI

Table-3: Biochemical profile in NAFLD – Mean value of total cholesterol 255 (± 7.2%), Mean value of Triglyceride 250 (± 11.2%), Mean value of HDL 43.2 (± 2.6), Mean value of LDL 129 (± 12.6), Mean value of AST was 53.4 (±3.2), Mean value ALT was 65.3 (± 5.4), Mean value of ALP was 10.5 (± 10.4%), Mean value of Sr. Albumin 3.48 (±0.11), Mean value of Total Bilurubin, 0.91 (±0.8), Mean value of BS 132 (11.2%), Mean value of HbA1c 9.10 (± 3.2).

Discussion

Present study of NAFLD in Maharashtra Population has 19 (21.1%) grade-I fatty liver, 40 (44.4%) grade-II fatty liver, 31 (34.4%) grade-III fatty liver (table-1). 54 (60%) had 22.8 to 23.2 BMI, 36 (40%) had 23.3 to 24.2 BMI, 55 (61.1%) type-II D M patients, 67 (74.4%) were hypertensive, 66 (73.3%) were hyperlipidemic 25 (27.7%) had IHD, 5 (5.55%) had MI (Table-2). Bio-chemical profile of NAFLD had 22.5 (±72), total cholesterol 250 (±11.2) Triglyceride, 43.2 (±2.6) HDL, 129 (±12.6) LDL, 53.4 (±3.2) AST, 65.3 (±5.4) ALT, 105 (±10.4) ALP, 3.48 (± 0.11) serum albumin, 0.91 (± 0.8), Total Bilurubin 132 (± 11.2) Fasting blood sugar, 9.10 (±3.2) HbA_1C (Table-3). These findings are more or less in agreement with previous studies[6][7][8].

NAFLD is associated with metabolic syndrome, which is characterised by insulin resistance, HTN, Cholesterol abnormality, increased risk of blood clotting, type-II DM, obesity, elevated serum triglyceride, and reduced HDL which has greater risk of heart diseases, stroke and liver related diseases [9]. Although, the exact cause of NAFLD is still unclear but it is associated with variations in lipid metabolism. It is also reported that NAFLD is the common cause of chronic liver diseases or chronic viral hepatitis [10]. Histological spectrum of NAFLD has no pathological changes which can definitively distinguish NAFLD from alcoholic liver diseases thus accurate alcohol history is essential to alcoholic liver disease.

Insulin resistance factor is believed to be 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 steastosis. Hence insulin resistance is almost universal factor in patients with NAFLD and is related to an imbalance between pro-insulin (adiponectin) and anti-insulin cytokine (TNF-α)[11].

It is also reported that, high prevalence of

NAFLD, is due to rapid industrialisation, sedentary life-style, obesity-DM, and junk-food intake in developing countries.

Summary and Conclusion

Present study of NAFLD is associated with obesity, diabetes and metabolic syndrome which is the major cause of morbidity and mortality because simple steatosis carries benign prognosis but in majority of cases will have hepato-cellular carcinoma. Although liver biopsy remains gold standard for disease assessment the development of risk scores, bio-marker panels but this demands further patho-physiological, genetic, nutritional, environmental, hormonal studies because exact pathogenesis of NAFLD is still unclear.

Limitation of study – Due to tertiary location of research centre, small number of patients and lack of latest techniques we have limited findings and results.

- This research paper is approved by Ethical committee of JIIUS Indian Institute of Medical Science and research Warudi, Tq-Badnapur, Dist- Jalna Maharashtra – 431202
- No Conflict of Interest
- No Funding

Table 1: Study of grades of Non-Alcoholic Fatty liver Disease

Sl. No	Grades of NAFLD	No. of patients (90)	Percentage (%)
1	Grade-I	19	21.1
2	Grade-II	40	44.4
3	Grade-III	31	34.4

Table 2: Clinical manifestations of Non-Alcoholic fatty liver Disease (NAFLD)

Sl. No	Clinical Manifestation	No. of Patients	Percentage (%)
1	Body Mass Index a-22.8 to 23.2	54	60
	b-23.3 to 24.2	36	40
2	Status of Diabetes Mellitus a – Pre-diabetic	35	38.8
	b – Diabetic	55	61.1
3	Status of Blood Pressure a – Norma tensive	23	25.5
	b – Hyper tensive	67	74.4
4	Hyper-lipidemic	66	73.3
5	Ischemic Heart Disease (IHD)	25	27.7
6	MI	05	5.55

Table 3: Biochemical profile of Non-Alcoholic Fatty liver Disease patients

Sl. No	Biochemical profile	Mean Value (±SD)
1	Total Cholestrol	225 (± 7.2)
2	Triglyceride	250 (± 11.2)
3	HDL	43.2 (± 2.6)
4	LDL	129 (±12.6)
5	AST	53.4 (± 3.2)
6	ALT	65.3 (±5.4)
7	ALP	10.5 (±10.4)
8	Serum Albumin	3.48 (±0.11)
9	Total Biliurubin	0.91 (±0.8)
10	Fasting Blood Sugar	132 (±11.2)
11	HA1C	9.10 (±3.2)

ALP = Alkaline Phosphatise

ALT = Alanine amino

LDL = Low Density Lipoprotein Transfarase

AST = Aspirate Amino transfarase lipoprotein

HbA1C = Haemoglobin Aic

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