## Medicine

## CLINICAL PROFILE OF PATIENTS WITH NON-ALCOHOLIC STEATOHEPATITIS

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**ABSTRACT** **Background:** Non-alcoholic fatty liver disease (NAFLD) is the accumulation of lipid,is considered to be the commonest liver problem in the north population, as a major cause of liver related morbidity and mortality. It is known to be associated with various metabolic abnormalities, but nort much information regarding association between the metabolic disease. primarily in the form of triacylglycerols in individuals who do not consume significant amounts of alcohol and other known causes of steatosis, such as certain drugs and toxins, have been excluded. The rising incidence of obesity is associated with health complications. NAFLD effecting about 15-40% of the north population is being considered hepatic manifestation of metabolic syndrome.

**Methods:** The study was an observational and analytical study of patients diagnosed as NAFLD, attending in opd and indoor patients of the Department of medicine, All india institute of medical science patna bihar. A total of 100 cases during the study period of Two years were included and investigated for metabolic syndrome .

**Conclusions:** it can be concluded that symptoms and signs of NAFLD are non-specific and occur later in the course of the disease hence the physician should have a high index of suspicion in order to detect NAFLD early in the course of the disease. The higher prevalence of all the components of metabolic syndrome in cases of NAFLD. Its early detection will help in modifying the disease course, delaying complications and also play a major role in prevent cardiology.

**KEYWORDS :** Clinical profile, Metabolic syndrome, Non-alcoholic fatty liver disease

## INTRODUCTION

Non-alcoholic fatty liver disease (NAFLD) is defined as the accumulation of lipid, primarily in the form of triacylglycerols in individuals who do not consume significant amounts of alcohol (<20 g ethanol/d).[1] the NAFLD is used to describe a wide array The rising incidence of obesity in today's environment is associated with many obesity-related health complications, including cardiovascular disease, diabetes, hyperlipidemia, hypertension, and nonalcoholic fatty liver disease.[2] This combination is also recognized as the metabolic syndrome and is characterized by underlying insulin resistance.[3] Non-alcoholic fatty liver disease is increasingly being recognized as a major cause of liver- related morbidity and mortality among 15-40% of the general population.[4]

The overall prevalence of NAFLD in western countries varies from 15-40% and in Asian countries from 9- 40%.[5,6] Epidemiological studies suggest the prevalence of NAFLD be around 9-32% in general Indian population, with a higher incidence amongst overweight/obese and diabetic/pre-diabetic patients.[7,8] Published literature on NAFLD from India is sparse. This may be related to the fact that the condition was recognized fairly recently, a presumption that the condition is benign and has a non- progressive course, a large burden of viral hepatitis in India tends to reduce the priority accorded to this condition. The absence of signs and symptoms and a lack of sensitive and specific diagnostic tests limit the ability to estimate the prevalence of NAFLD. The current epidemics of obesity and diabetes among adults and children residing in both developed and developing countries suggest that prevalence of NAFLD is expected to increase further in future.[9,10] Metabolic syndrome and associate comorbidities like diabetes T2DM, obesity and dyslipidemia are predisposing factors of NAFLD.Even in the absence of alcohol intake, patients who have one or more components of the metabolic syndrome with insulin resistance, develop hepatic steatosis due to increased lipolysis and increased delivery of fatty acids from adipose tissue to liver.[4]

Fatty liver disease is defined as more than 5% of the hepatocytes containing fat or more than 5% of the liver weight due to fat.[11] Currently a liver biopsy is the gold standard method for diagnosing NAFLD. Compared to invasive biopsy and expensive MRS and CT, ultrasonography (USG) is relatively inexpensive and widely available in clinical settings, although it is unable to detect less than 10% steatosis of hepatocytes.[12] The third report of the national cholesterol education programme expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (adult treatment panel III [ATP III]) recommended the use of five variables for diagnosing the metabolic syndrome, namely waist circumference, serum triglyceride level, serum high-density lipoprotein (HDL) cholesterol level, blood pressure, and fasting plasma glucose level.[13]

central pathogenic factor. Metabolic syndrome is characterized by the presence of insulin resistance in association with other metabolic abnormalities such as obesity, diabetes, dyslipidemia and hypertension. According to adult treatment panel III (ATP III) criteria, metabolic syndrome is defined by the presence of at least 3 of the 5 criteria, namely obesity, diabetes mellitus, hypertension, low HDL, high triglycerides.[14] The present study was designed to study the clinical profile of patients with NAFLD with varying degrees of severity as diagnosed by Ultrasonography and evaluate the cross-sectional relationship between the non-alcoholic fatty liver disease and the metabolic syndrome along with its individual components, as defined by the modified NCEP ATP III criteria.

## METERIALS AND METHODS

The study was an observational and analytical study of patients diagnosed as NAFLD attending in opd and indoor Department of medicine at All india institute of medical science patna bihar. A total of 100 cases were included in the study, during the study period of Two years all patients was obtained prior to the study.

The patients diagnosed as NAFLD on USG seeking treatment in the Department of Medicine IPD and OPD were included and investigated for metabolic syndrome according to the NCEP ATP 3 criteria. The data was collected during OPD/IPD treatment.

### Inclusion criteria
• All patients diagnosed as NAFLD by abdominal Ultrasonography Age more than 18 years.

### Exclusion criteria
• Patients less than 18 yrs and more 74 years.
• Patients with history of alcohol intake more than 30grams/day in and more than 25grams/day in females.
• Patients with a history of jaundice or HBsAg positive
• Patients with history of following drug intake - steroids, synthetic estrogens, heparin, and calcium channel blockers, amiodarone, valproic acid, antiviral agents.[15]
• the vascular wall due to great hyperechogenicity in the parenchyma.

Non alcoholic fatty liver disease NAFLD is now considered the most prevalent chronic liver disease CLD common cause of end stage liver disease, cirrhosis and hepatocellular carcinoma in the future.

Final aim of preventing liver related and other complications, Knowledge on the natural history of NAFLD and its implications for a rational and more individualized approach to the condition, Cirrhosis is the end stage of a wide number of chronic liver conditions that share common features of necroinflammation, fibrosis, and regenerative nodules, which modify the normal liver structure to reduce its functional mass and alter the vascular architecture.

NAFL has becomes one of the leading causes of cirrhosis in some countries.

The number of individuals with NAFLD cirrhosis is predicted to exceed that of those with hepatitis B and C related cirrhosis, And NAFLD cirrhosis will become the leading indication for liver transplantation.

It is the main cause of elevated serume liver enzymes among the general and rwo wide spectrum of liver damage.

Pathophysiological mechanism include the accumulation of triglycerides in hepatocytes, necrosis of hepatocytes and inflammation.

Most patients with NAFLD have no symptoms or signs of liver disease.

Hepatomegaly is the only physical finding , mildly to moderately elevated serume levels of aspartate aminotransferase, alanine aminotransferase, or both are the most common laboratory abnormality found in patients with NAFLD .imaging procedures revealed that ultrasonography.

Grade 1: Slight diffuse increase in the fine echoes. Liver appears bright as compared to the cortex of the kidney. Normal visualization of the diaphragm and intrahepatic vessel borders.

Grade 2: Moderate diffuse increase in the fine echoes. Slightly impaired visualization of the intrahepatic vessels and diaphragm

Grade 3: Marked increase in the fine echoes. Poor or no visualization of intrahepatic vessel borders, diaphragm, and the vessels.

All patients in the study underwent routine investigations including complete blood counts, blood sugar, liver function tests, HBsAg, anti-HCV, and lipid profile. All patients diagnosed as NAFLD were investigated for metabolic syndrome according to the NCEP ATP III criteria and a relationship between NAFLD and metabolic syndrome was correlated.[10]

**Metabolic syndrome was diagnosed as per NCEP ATP 3 criteria (three or more of the following):**

A. Elevated waist circumference    (Asian Indian criteria)[16]
• Men: Equal to or greater than 90 cm
• Women: Equal to or greater than 80 cm

B. Elevated triglycerides: Equal to or greater than 150 mg/dL (1.7 mmol/L)
C. Reduced HDL cholesterol
• Men: Less than 40 mg/dL (1.03 mmol/L)
• Women: Less than 50 mg/dL (1.29 mmol/L)

D. Elevated blood pressure: Equal to or greater than 130/85 mm Hg or use of medication for hypertension

E. Elevated fasting glucose: Equal to or greater than 100 mg/dL (5.6 mmol/L) or use of medication for hyperglycaemia.

**RESULTS**
A total of 100 cases ultrasonographically diagnosed as NAFLD were included in the study and showed 49%, 38% and 13% of cases had grade I, II, and III fatty liver respectively.

**Table 1: Distribution of patients according to their clinical and biochemical profiles (n=100).**

| Variable | Mean | ± SD |
|---|---|---|
| Age (in year) | 53.70 | ±7.22 |
| Body mass index (kg/m2) | 27.60 | ±4.39 |
| Waist circumference (cm) | 74.22 | ±7.44 |
| Diastolic blood pressure (mm Hg) | 92.87 | ±6.25 |
| Systolic blood pressure (mm Hg) | 132.0 | ±18.17 |
| Fasting blood sugar (mg/dl) | 124.17 | ±62.62 |
| Total cholesterol (mg/dl) | 196.16 | ±54.59 |
| Serum triglycerides (mg/dl) | 185.13 | ± 77.5 |
| High density lipoprotein (mg/dl) | 45.23 | ±9.13 |
| Serum LDL (mg/dl) | 125.43 | ±27.44 |
| Serum VLDL (mg/dl) | 22.14 | ±6.09 |
| Aspartate amino transferase (u/l) | 53.12 | ±31.33 |
| Alanine amino transferase (u/l) | 65.33 | ±49.02 |

**Table 2: Distribution of patients according to the prevalence of variables in patients of NAFLD with metabolic syndrome and NAFLD without metabolic syndrome.**

| Variables | NAFLD with Metabolic syndrome (N= 57) | NAFLD without Metabolic syndrome (N=43) | Total | P-value |
|---|---|---|---|---|
| Fasting plasma glucose >100 mg/dl | 34 (59.64%) | 19 (44.18%) | 53 | <0.05 |
| Hypertension > 130/85 mmHg | 24 (42.10%) | 14 (32.55%) | 38 | <0.05 |
| Triglycerides > 150 mg/dl | 43 (75.43%) | 27 (62.79%) | 70 | <0.05 |
| HDL M < 40mg/dl F < 50mg/dl | 37 (64.91%) | 14 (32.55%) | 51 | <0.05 |
| Waist circumference M > 90cm F > 80 cm | 29 (50.87%) | 15 (34.88%) | 44 | <0.05 |

**3: Distribution of patients according to the grades of NAFLD.**

| | NAFLD with metabolic syndrome | | | NAFLD without metabolic syndrome | | |
|---|---|---|---|---|---|---|
| | Grade I n= 26 | Grade II n=22 | Grade III n= 9 | Grade I n=23 | Grade II n=16 | Grade III n=4 |
| ALT ≥ 41 IU | 8 (30.76%) | 14 (63.63%) | 6 (66.66%) | 15 (65.21%) | 7 (43.75%) | 1 (25%) |
| AST ≥ 38 IU | 8 (30.76%) | 8 (36.36%) | 6 (66.6%) | 9 (39.13%) | 4 (25.00%) | 1 (25%) |
| Central obesity (WC) (> 90 cm - M, > 80 cm - F) | 9 (34.61%) | 16 (72.72%) | 4 (44.44%) | 9 (39.13%) | 5 (31.25%) | 1 (25%) |
| Impaired fasting glucose (>100 mg/dl) | 9 (34.61%) | 20 (90.90%) | 5 (55.55%) | 10 (43.47%) | 7 (43.75%) | 2 (50%) |
| Hypertension (130/85 mmHg) | 6 (23.07%) | 14 (63.63%) | 4 (44.44%) | 10 (43.47%) | 3 (18.75%) | 1 (25%) |
| Low HDL (<50 mg/dl- F, <40 mg/dl- M) | 11 (42.30%) | 19 (86.36%) | 7 (77.77%) | 9 (39.13%) | 4 (25.00%) | 1 (25%) |
| Hypertriglyceridemia (>150 mg/dl) | 16 (61.53%) | 19 (86.36%) | 8 (88.88%) | 16 (69.56%) | 9 (56.25%) | 2 (50%) |

Table 1 shows that mean age of the patient was 53.70±7.22 years. On physical examination findings showed the mean BMI was 27.6±4.39 kg/m$^2$, mean waist circumference was 74.22±7.44 cm. Mean diastolic blood pressure (mm Hg) was 92.87±6.25 and mean systolic blood pressure (mm Hg) 132.0±18.17. The mean fasting blood sugar (mg/dl) was 124.17±62.62 and mean total cholesterol (mg/dl) was 196.16±54.59 and mean serum triglycerides (mg/dl) were 185.13±77.5.

Table 2 shows that out of 100, patients with NAFLD with metabolic syndrome were 57% and without metabolic syndrome were 43%. The study shows that 53% patients had fasting plasma glucose >100 mg/dl while 38% patients were hypertensive. Maximum 70% patients had triglycerides >150 mg/dl while low serum HDL level was seen in 51% patients and increased waist circumference was found in 44% patients. The difference was statistically significant (p<0.05).

Table 3 shows that altered ALT ≥41 IU was observed in 14 (63.63%) of Grade II of patients with NAFLD with metabolic syndrome. Central obesity was observed in 16 (72.72%) of Grade II patients with NAFLD with metabolic syndrome. While 20 (90.90%) Grade II of patients with NAFLD with metabolic syndrome showed impaired fasting glucose (>100 mg/dl). Hypertriglyceridemia (>150 mg/dl) in 16 (69.56%) seen in Grade I of patients with NAFLD without metabolic syndrome.

## DISCUSSION

NAFLD has emerged as the most common cause of chronic liver disease. The incidence of impairment of various parameters in grade II and III fatty liver is consistently higher in cases of NFLD. In the present study, it was observed that mean age of the patient was 53.70±7.22 years. On physical examination mean BMI was 27.6±4.39 kg/m$^2$ while mean waist circumference was 74.22±7.44 cm. Mean Diastolic blood pressure (mm of Hg) was92.87±6.25 and mean Systolic blood pressure (mm Hg) 132.0±18.17. These results are consistent with studies by Rakesh Gaharwar et al and Animesh Deb et al.[17,18] The mean Fasting blood sugar (mg/dl) was 124.17±62.62 and mean total cholesterol (mg/dl) was 196.16±54.59 while mean Serum triglycerides (mg/dl) were 185.13±77.5 these findings are similar to study by Shivaram Prasad Singh et al and Kwon YM et al. The present study, it was observed that out of 100, patients with NAFLD with metabolic syndrome were 57% and without metabolic syndrome were 43%. The study shows that 53% patients had fasting plasma glucose>100 mg/dl, while 38% patients were hypertensive similar to studies by Rakesh Gaharwar et al and Animesh Deb et al.[17,18] Maximum 70% patients had Triglycerides>150 mg/dl while low Serum HDL level was seen in 51% patients and increased waist circumference was found in 44% patients which were also observed by Yang KC et al and the difference was statistically significant.

The present study, it was observed that altered ALT ≥41 IU was observed in 14 (63.63%) Grade II NAFLD patients with metabolic syndrome. Central obesity was observed in 16 (72.72%) Grade II NAFLD patients with metabolic syndrome. These findings are consistent with the study by Vendhan R et al and Andrade GC, while 20 (90.90%) Grade II of patients with NAFLD with metabolic syndrome Hypertriglyceridaemia (>150 mg/dl) in 16 (69.56%) Grade I of patients with NAFLD without metabolic syndrome. These results are consistent with studies by Gaharwar R et al and Deb A et al.[17,18]

it was observed that mean Fasting plasma glucose (mg/dl) 132.62±45.35 was observed in patients with NAFLD with metabolic syndrome while mean SBP 134.21±17.56 was observed in patients with NAFLD with metabolic syndrome and the difference was not significant.

## CONCLUSION

Symptoms and signs of NFLD are non specific and occur later in the course of the disease course and delaying its complications. Preventive programe should be launched to encourage people to adopt healthy life style do regular exercise,low take calories, high diet fiber is considered the gold standard for diagnosing NAFLD but is not practical and most patients are not willing to undergo the test. Thus, patients must be evaluated for the presence of NAFLD by abdominal Ultrasonography.

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