

## PREVALENCE OF NON ALCOHOLIC FATTY LIVER DISEASE IN PATIENTS OF DIABETES MELLITUS



### Medicine

**KEYWORDS:** Diabetes mellitus, Non-alcoholic fatty liver disease, cirrhosis

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### ABSTRACT

Non-alcoholic fatty liver disease (NAFLD) is one of the types of fatty liver which occurs when fat is deposited in the liver due to causes other than excessive alcohol use. NAFLD is the most common liver disorder in developed countries. NAFLD is related to Diabetes mellitus and the metabolic syndrome. Up to 80% of obese people have the disease. Non-alcoholic steatohepatitis is the most extreme form of NAFLD, and is regarded as a major cause of cirrhosis of the liver of unknown cause. Most people have a good outcome if the condition is caught in its early stages. In our study we will find out the prevalence of Non-alcoholic liver disease in patients of Diabetes mellitus.

### INTRODUCTION:

Metabolic disorders, particularly Diabetes Mellitus, is considered to be an important public health threat globally. Of these 90% have Type 2 Diabetes, the hallmark of which is a pathophysiological state called Insulin resistance. Long considered to be a disease of affluence and accompanying development, a progressively increasing segment of the population of developing countries are afflicted with diabetes, obesity, hypertension and dyslipidaemia, conditions which often coexist and comprise the enigmatic syndrome X. The vascular problems arising in Diabetes has long acquired the central place in discussions and research in Diabetes. Thus, Diabetes has largely been considered a vascular disease. Only recently has liver disease been focused as a complication of diabetes, particularly type 2 diabetes. The standardized mortality rate due to cirrhosis in Diabetes exceeds that due to cardiovascular disease. The most common metabolic liver disease, non-alcoholic fatty liver disease (NAFLD), is associated with insulin resistance (IR) and type 2 diabetes is the most common underlying disease causing this syndrome.

### AIMS & OBJECTIVES:

To document the prevalence of NAFLD and the spectrum of the disease in type-2 Diabetes Mellitus.

### MATERIALS AND METHODS:

The study was undertaken on the patients attending the Diabetic clinic of Jawahar Lal Nehru Medical College & Hospital, Bhagalpur and on the patients attending outdoor and indoor of medicine department of Jawahar Lal Nehru Medical College, Bhagalpur.

100 patients with type 2 DM, satisfying ADA criteria for diagnosis of type 2 DM, were enrolled for the study.

### Exclusion criteria

The following patients were excluded from the study -

1. Patients who are alcoholic
2. Pregnant
3. Patients with acute infection or recent stressful event (e.g. AMI, surgery, trauma, etc.) within the past 4 weeks.
4. Patients having evidence of following concomitant chronic diseases -

Exocrine pancreatic insufficiency state or Endocrine disorders such as hyperthyroidism, acromegaly, hypopituitarism, cushing's disease, pheochromocytoma.

5. Patients having undergone intestinal resection, gastrectomy, abnormal gut motility states, chronic diarrheal disease or malabsorption syndrome.

6. Patients with severe renal insufficiency (GFR < 30 ml/min) 119 or ESRD, or with serum creatinine > 2mg/dl.
7. Patients with familial dyslipidemias.
8. Patients with autoimmune hepatitis.
9. Patients with Wilson's disease.
10. Patients with positive marker for hepatitis B and C.
11. Patients with sudden weight loss.
12. Patients receiving drugs known to cause fatty liver, e.g. amiodarone, bleomycin, coumarin, estrogen, glucocorticoids, hydrazine, L-asparaginase, methotrexate, tetracycline.
13. Patients receiving any Ayurvedic or Bio-chemic preparations for long periods.
14. Patients taking pioglitazone group of drugs.

After obtaining informed consent from each patient, a detailed clinical history and physical examination along with laboratory investigations were conducted.

All the patients were subjected to blood sugar (fasting and PP), Blood urea and serum creatinine, routine urine examination, liver function tests, lipid profile, HBsAg, Anti HCV, USG (Abdomen). In a subset of patients liver biopsy was also done.

### RESULTS:

#### Abdominal Ultrasonography finding of study group:

All patients included in the present study were screened for fatty liver by abdominal ultrasonography, because sensitivity and specificity of USG 83% and 100% respectively, for diagnosis of fatty liver.

In the study we documented that out of the 100 patients included in the study 49 subjects were found to be having fatty liver.

**Table 1:** USG grading of fatty liver of the study group.

GRADING	NUMBER OF CASES	PERCENTAGE
GRADE I	28	57%
GRADE II	13	26%
GRADE III	08	16%
TOTAL	49	99

Then we subjected the subjects with Grade I and II that is 21 patients to histopathological examination.

**Table 2.** Histopathological (HP) abnormality in the patients with fatty liver (Grade I & II) on USG

TYPE OF HP ABNORMALITY	NUMBER OF CASES	PERCENTAGE
STEATOSIS	12	57%
STEATO HEPATITIS	08	38%

CIRRHOSIS	01	04.7%
TOTAL	21	99.7%

Majority of the patients had only steatosis (57%). 38% had steatohepatitis with or without fibrosis. However, a very significant percentage had cirrhosis (4.7%).

#### DISCUSSION:

Non - alcoholic fatty liver disease (NAFLD), that forms a spectrum of structural and functional derangements from steatosis alone through steatohepatitis to cirrhosis of liver, are now recognized to be the major cause of liver disease related morbidity and mortality globally. Type 2 Diabetes, characterized by Insulin resistant state, is the most common association of NAFLD. Around 75% of type 2 diabetics, on an average, will have NAFLD the frequency being higher in obese diabetics. It is also known that diabetes and obesity influences liver function in otherwise healthy subjects. It is noteworthy here, that one of the important determinants of type 2 diabetes in the west - obesity - is not common in our country or have anthropometric determinants which are different from that used for studies in western population. Most data on the prevalence and spectrum of liver disease in Type 2 diabetics is in western population and is likely to be confounded by the influence of obesity. In the present study, the prevalence of fatty liver in type 2 diabetes, by ultrasound examination was 48.61%.

Ultrasound was very effective in diagnosing fatty liver in our study. The sensitivity and specificity of ultrasound has been reported to be 83% and 100%, respectively. CT scan and other imaging modalities are similar in sensitivity and specificity, are more costly. We therefore, used ultrasonography in the diagnosis of fatty liver.

Since NASH is diagnosed histologically and these histological changes are accurately reflected in imaging studies, liver biopsy still remains the gold standard in diagnosis of NASH. We had performed liver biopsy in those with grade 2 and grade 3 fatty liver on USG examination. We found that majority, of those with NAFLD had mild steatosis only (57%), with advanced changes being found only in a minority. NASH was present in 38% and cirrhosis in 4.7%.

Increased prevalence of liver disease in diabetes mellitus had been noted more than half a century ago. It was also recognized long ago that fatty changes in the liver is a common association of diabetes. However, the significance of these fatty changes were not clear till very recently when long term follow up studies of patients with fatty liver started appearing in the last fifteen years. These studies revealed that the outcome of fatty liver disease, not associated with alcohol intake, is variable, not always reversible and benign as was thought earlier and 'needs to be defined as an entity itself. Although liver disease in diabetes is today often considered to be synonymous with non-alcoholic fatty liver disease, that's an over simplification of fact. Apart from this "diabetic" liver disease, lifestyle related factors predispose them to the acquisition of hepatitis viruses B and C, the most common causes of chronic liver disease in the developing countries. Diabetics are also prone to develop drug induced liver disease, because of the intake of many drugs for diabetes per se and co morbid conditions.

The term Non-Alcoholic steato-hepatitis or NASH was first used by Ludwig in 1980 to describe the pathological and clinical features of non-alcoholic; disease of the liver associated with the features seen most commonly in alcoholic liver disease per se. NASH is the central entity denoting progression, in the spectrum of liver disorders, called non-alcoholic fatty liver disease (NAFLD), that include simple steatosis through NASH and fibrosis to cirrhosis of liver with fat. This can progress to end stage chronic liver disease and hepatocellular carcinoma. It is now very well recognized that an underlying metabolic syndrome and insulin resistance with type 2 diabetes are the most common associations of cryptogenic chronic hepatitis. Moreover, NAFLD and diabetes mellitus are also important risk factors for hepatocellular carcinoma Although Obesity is often a

confounding factor, it is now clear that hepatic fibrosis is more prominent in diabetes with obesity than with a comparable group with obesity alone. Its prevalence is as high as 50% in patients with type 2 diabetes and 100% in diabetes with obesity. Of these affected patients 50% have NASH and 17% have cirrhosis.

#### CONCLUSION:

Liver disease, particularly NAFLD, is presently considered to be an important cause of morbidity and mortality in type 2 diabetes, expanding the spectrum of organ dysfunction in this condition. Data from our country is limited and there is a trend that suggests that India will have a big burden of type 2- diabetes in the years to come. The main complication of nonalcoholic fatty liver disease and nonalcoholic steatohepatitis is cirrhosis, which is late-stage scarring (fibrosis) in the liver. As the liver tries to halt inflammation, it produces areas of scarring (fibrosis). With continued inflammation, fibrosis spreads to take up more and more liver tissue. About 20 percent of people with nonalcoholic steatohepatitis will progress to cirrhosis. In our study we see that almost 50% of the diabetics were affected with non-alcoholic fatty liver disease which can end up in steatohepatitis and even cirrhosis, thus timely intervention of Diabetes mellitus and proper management of fatty liver is intended.

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