



A Study on the Prevalence of Non Alcoholic Fatty Liver Disease of Patients with Diabetes Mellitus

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ABSTRACT

Objectives: *Our study was to evaluate the prevalence and spectrum of disease of nonalcoholic fatty liver of patients with diabetes mellitus.*

Methodology: *A detail relevant history and assessment and relevant investigations was taken to all patients. A complete laboratory investigation like Blood sugar (fasting and PP), Blood urea and Serum creatinine, Routine urine examination, Liver function tests, Lipid profile, HBsAg, Anti HCV, USG (Abdomen) were performed to all patients.*

Results: *Data was analyzed by using simple statistical methods with the help of MS-Office software.*

Conclusions: *Almost half of the cases of diabetes mellitus were affected with nonalcoholic fatty liver. Fatty liver disease may progress to steatohepatitis and cirrhosis.*

Keywords: *Diabetes mellitus, non alcoholic, fatty liver.*

INTRODUCTION

Fatty liver is considered to occur commonly in type 2 diabetes mellitus (DM), with estimates of prevalence ranging from 21 to 78%^[1,2,3]. Obesity, insulin resistance, and increased concentrations of plasma fatty acids are considered to increase the risk for fatty liver^[4], and each of these metabolic factors is also characteristic of type 2 DM. In some individuals, fatty liver can lead to steatohepatitis and progress further to end-stage liver disease; however, many clinical symptoms of fatty liver are nonspecific or silent^[1]. Nevertheless, even for those in whom there is not progression to inflammation and fibrosis in the

liver, this does not mean that fatty liver is benign. It has been reported that fatty liver influences severity of hepatic insulin resistance in type 2 DM. Ryysy et al.^[5] observed that hepatic fat content in patients with type 2 DM predicted the amount of daily insulin needed to maintain glycemic control; also, among nonobese men without type 2 DM, fatty liver was found to correlate with hepatic insulin resistance independently of obesity and intra-abdominal adiposity^[6]. Nonalcoholic fatty liver disease (NAFLD) is the most common, chronic liver disease worldwide. Within this spectrum, steatosis alone is apparently benign, while nonalcoholic steatohepatitis may

progress to cirrhosis and hepatocellular carcinoma. NAFLD is strongly associated with obesity, dyslipidemia, type 2 diabetes mellitus, and cardiovascular disease. Non-alcoholic fatty liver disease (NAFLD) is highly prevalent in type 2 diabetes mellitus (T2DM), likely reflecting the frequent occurrence of obesity and insulin resistance in T2DM.^[7] NAFLD involves the presence of hepatic steatosis not caused by alcohol intake. NAFLD may progress from steatosis to steatohepatitis (with evidence of inflammation and cell injury), cirrhosis (hepatic fibrosis), and ultimately liver failure.^[8]

In assessing disease severity and risk of progression to cirrhosis, it is useful to divide NAFLD into two categories: non-alcoholic fatty liver (NAFL) and non-alcoholic steatohepatitis (NASH). The difference between the two entities is histologic. In NASH, there is the presence of hepatic inflammation in contrast to NAFL, which involves only steatosis. NAFL and NASH occur as part of a continuum in which the histology often is not exclusively steatosis or steatohepatitis. As one approach to defining the extent and severity of disease, an NAFLD activity score (NAS) has been developed, which assigns numerical values to various histologic measures of steatosis, inflammation, cell injury, and fibrosis.^[9]

Aim of our study was to observe the spectrum of disease and prevalence of non alcoholic fatty liver of patients with diabetes mellitus.

Materials and Methods

A total of 120 patients (males:70, females:50) with age group less than or equal to 40 years to age group greater than or equal to 60 years were included in this study. All the patients were with clinical symptomology of fatty liver and non alcoholic associated with type 2 diabetes mellitus, satisfying ADA criteria for diagnosis of type 2 DM, were enrolled.

The entire subjects signed an informed consent approved by institutional ethical committee of Katihar Medical College, Katihar, Bihar, India was sought. Data was collected on the basis of

inclusion and exclusion criteria, with irrespective of sex in OPD or the ward, of department of Medicine/Radio diagnosis, Katihar Medical College, Katihar, Bihar during period of December 2016 to January 2017.

Exclusion criteria of this study were: 1. Patients who was alcoholic, 2. Pregnant, 3. Patients with acute infection or recent stressful event (e.g. AMI, surgery, trauma, etc.) within the past 4 weeks, 5. 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.

Methods

A detailed clinical history and physical examination along with laboratory investigations were conducted to all patients. A complete laboratory investigation like Blood sugar (fasting and PP), Blood urea and Serum creatinine, Routine urine examination, Liver function tests, Lipid profile, HBsAg, Anti HCV, USG (Abdomen) were subjected to all patients. In a subset of patients liver biopsy was also performed.

Statistical Analysis

Data was analyzed by using simple statistical method with the help of MS-Office software.

Results and Observations

This present study was conducted in Department of Medicine, Katihar Medical College, Katihar, Bihar, India during period of December 2016 to April 2017.

In this study a total of 120 patients (70: males and 50: females) with diabetes mellitus were enrolled. Percentage of male and females were 58.33% and 41.67% respectively.

In this study, age group of patients less than 40 years and greater than 60 years were included. In this study, 10(8.33%) patients were in age less than or equal to 40 years. 30(25%) patients were in age group of 41-50 years. 55(45.83%) patients were in age group of 51-60 years. And 25(20.83%) patients were in age group of greater than or equal to 61 years. These studies shown that maximum number of patients were in age group of 51-60 years.

Table.1. Age group and number of patients with type 2 diabetes mellitus.

| Age group | Number of patients | Percentage |
|-----------|--------------------|------------|
| ≥40 | 10 | 8.33 |
| 41-50 | 30 | 25 |
| 51-60 | 55 | 45.83 |
| ≤ 61 | 25 | 20.83 |
| Total | 120 | 100 |

Abdominal Ultrasonography

In this study, all patients were screened for fatty liver by abdominal ultrasonography. Because sensitivity and specificity of USG are 83% and 100% respectively, for diagnosis of fatty liver.

Ultrasonography findings of patients: Out of 120 patients, we were found that 60 patients associated with diabetes mellitus having fatty liver.

Table. 2: USG grading of fatty liver of the study group.

| Grading | Number of cases | Percentage |
|-----------|-----------------|------------|
| Grade I | 34 | 58.33% |
| Grade II | 16 | 26.67% |
| Grade III | 10 | 16.67% |
| Total | 60 | 100 |

In this present study, out of 120 patients, 60(50%) patients with diabetes mellitus had fatty liver. In these, 34(58.33%) patients had grade I, 16 (26.67%) had grade II and 10(16.67%) patients had grade III fatty liver. That was majority of patients were grade I fatty liver.

Table.3. Histopathological (HP) abnormality in the patients with fatty liver (Grade I & II) on USG

| Type of HP abnormality | Number of cases | Percentages |
|------------------------|-----------------|-------------|
| Steatosis | 16 | 61.53% |
| Steatohepatitis | 08 | 30.76% |
| Cirrhosis | 02 | 07.69% |
| Total | 26 | 100% |

We were performed the histopathological examination of patients with grade II and grade III fatty liver on USG. Total patients with grade II and III fatty liver were 26.

We were found that majority of patients 16(61.53%) had steatosis, 08(30.76%) had steatohepatitis with or without fibrosis. And (07.69%) patients had cirrhosis.

Discussion

This present study was conducted in department of Medicine, Katihar Medical College, Katihar, Bihar.

The work regarding non-alcoholic fatty liver disease (NAFLD) was launched only three decades ago, when Ludwig et al^[10] described an “unnamed” and “poorly understood” liver disease they named non-alcoholic steatohepatitis (NASH) in 20 patients that histologically reminded authors of alcoholic hepatitis with a potential of progression to cirrhosis. Although 20 patients with NAFLD today could likely be recruited within one day in a lobby of a hotel, their observation that NASH is an obesity-associated disease largely accompanied by diabetes mellitus presenting with hepatomegaly and mild abnormalities of liver tests still accurately describes the most common clinical findings.^[11]

In the present study, a total of 120 patients with diabetes mellitus were included. Majority of patients (45.83%) with diabetes mellitus were in age group of 51-60 years.

Out of 120 diabetic cases, only 60(50%) patients were fatty liver. Our study shown the prevalence of fatty liver in type 2 diabetes, by ultrasound examination was 50%. 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. In this present study. We were performed the USG on fatty liver patients. Majority of patients (58.33%) were grade I fatty liver. Since NASH is diagnosed histologically and these histological changes are in 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 cases with NAFLD had mild steatosis (61.53%). NASH was present in 30.76% and cirrhosis in 7.69%.

Future Research

Science is dynamic and there is always a scope of improvement and change in time to come ahead. With progressive aim to move ahead we aspire to achieve highly accurate and reliable results. Thus every study leaves back scopes for other researcher to do something more advanced and varied in order to touch the height of perfection. This study examined only 120 subjects (70: males and 50: females), future researchers can expand the study by including more number of subjects so as to make generalization of the results and practice, further studies with a larger sample size and in multiple centers are required. Thus it could be applied to real life situation.

Limitation

There were several limitations like, the sample size was small, and it was a hospital-based study, the prevalence of exposure and outcome variables may be different from a community setting.

Conclusion

This study concluded that half of the diabetes patients are suffered with fatty liver diseases. NAFLD is the common causes of steatohepatitis. This steatohepatitis may lead to cirrhosis.

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