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ORIGINAL RESEARCH

Study on Prevalence of Non-Alcoholic Fatty Liver Disease among Diabetes Mellitus Patients

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ABSTRACT

Background: Non-alcoholic fatty liver disease (NAFLD) is being increasingly recognized today as a potentially serious complication of diabetes, especially type 2. Aim and Objectives: To know the prevalence of NAFLD among diabetes mellitus.

Materials and Methods: A prospective observation study was conducted, in Department of General medicine, CAIMS, Karimnagar, for the duration of one year. In which 50 patients were included after following inclusion and exclusion criteria and approved by institutional ethical committee**.**

Results: The study group consisted of about 17 males and 23 females, between the age groups of 19 – 73 yrs, the average age was 49.23 yrs. The duration of diabetes in these patients ranged between 0 to 20 yrs. with the average duration being 5.17 yrs. Among all 42% of the patients were found with fatty liver, which was more common among female.

Conclusion: Prevalence of NAFLD was observed mainly in patients with type 2 diabetes mellitus and also it was found more common among women compared to men. NAFLD was found to higher in patients who were overweight or obese, in those with central obesity**.**

Keywords: Non- Alcoholic fatty Liver disease, Diabetes Mellitus, Central obesity etc.

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INTRODUCTION

As the disease name suggests, NAFLD involves the presence of hepatic steatosis not caused by alcohol intake. When examined histologically, e.g., in a liver biopsy specimen, excess accumulation of lipids (representing predominantly triglycerides) is evident within hepatocytes. In some cases, NAFLD may progress from steatosis to steatohepatitis (with evidence of inflammation and cell injury), cirrhosis (hepatic fibrosis), and ultimately liver failure. Hepatic steatosis and steatohepatitis can occur in association with multiple diseases affecting the liver, including hepatitis A, B and C, autoimmune hepatitis, hemochromatosis, and hypothyroidism. However, much of the increase in prevalence of NAFLD is driven by its epidemiologic and pathophysiologic links to type 2 DM (T2DM) and obesity. The prevalence of NAFLD in obese adults with T2DM has been estimated to be greater than 70%.[1] Alanine aminotransferase has been noted to be more than twice normal in 20% of children with T2DM, and this is attributed in most cases to NAFLD.[2]

The incidence of diabetes in India is 3.8%.[3] It is well known that diabetes is a systemic disease, it affects almost all organ systems. Non-alcoholic fatty liver disease (NAFLD) is being increasingly recognized today as a potentially serious complication of diabetes, especially type 2. The spectrum of NAFLD extends from simple steatosis or steatosis with mild inflammation to severe non-alcoholic steatohepatitis (NASH). The pathophysiology and

treatment remain unclear in many respects, but much progress has been made since the introduction of the terms non-alcoholic steatohepatitis (NASH) in 1980 and non-alcoholic fatty liver disease (NAFLD) in 1986.[4, 5]

There are many studies exist to show relation between NAFLD and Diabetes mellitus in different setting, we have undertaken this study to show same relation and prevalence of NAFLD among the diabetic patients attending at our tertiary care centre.

MATERIALS & METHODS

A prospective observation study was conducted, in Department of General medicine, CAIMS, Karimnagar for the duration of one year. In which 50 patients included after following inclusion and exclusion criteria and approved by institutional ethical committee.

Inclusion Criteria

Presence of diabetes mellitus (types 1 or 2) of any duration.

Exclusion Criteria

Consumption of alcohol

Seropositivity to HIV ELISA

Seropositivity of anti HCV antibody

Patients on drugs that are proven to cause steatohepatitis (steroids, amiodarone, oral contraceptive pills and other estrogen containing preparations.

Method

All the above patients were screened for HIV and HCV and were negative for both. The following investigations were done on these

patients:

- Liver function test
- Lipid profile
- Ultrasound abdomen
- Random blood sugar

The patient's weight and height were measured and BMI calculated. A BMI >25 was considered overweight. Waist hip ratio was also measured to look for central obesity.

If the ultrasound showed evidence of fatty liver, with or without the elevation of transaminases, a presumptive diagnosis of NAFLD was made.

The data were collected and analysed for the following:

- Prevalence of NAFLD
- Association between lipid profile and presence of NAFLD
- Relationship between central obesity and NAFLD.

RESULTS

A total of 50 diabetics (both type 1 and type 2) were studied during this period. Both inpatients and outpatients were included in the study. The study group consisted of about 17 males and 23 females, between the age groups of 19 – 73 yrs, the average age was 49.23 yrs. The duration of diabetes in these patients ranged between 0 to 20 yrs. with the average duration being 5.17 yrs.

Table 1: Distribution of fatty liver among study population

Parameters	Frequency	Percentage
Fatty Liver	21	42
Without Fatty Liver	29	58

Table 2: Distribution of others parameters among study population

Parameters	Frequency	Percentage
Gender		
Male	10	20
Female	40	80
Waist Hip Ratio		
> 1	15	75
< 1	5	25
Triglyceride Level		
Increased	19	91
Normal	2	9
Body Mass Index		
>25	14	67
< 25	7	33
Cholesterol Level		
> 200	14	67
< 200	7	33

The number of patients with fatty liver who had central obesity (waist hip ratio >1 15 (15%). All the patients with fatty liver had central obesity (waist hip ratio >1 in males and >0.85 in females). The number of patients who had increased triglycerides >180 among patients with fatty liver 19 (91%). No. of patients who were overweight among the persons detected to have fatty liver 14 (67%) No. of patients with normal BMI among the persons with fatty liver 7(33%)

All the patients with ultrasound evidence of fatty liver showed, marginally elevated transaminases and occasionally of serum alkaline phosphatase. There was no alteration in the serum protein or albumin globulin ratio.

DISCUSSION

Diabetes and NAFLD are reciprocal risk factors and when they are occur together, an increasing body of data demonstrates that diabetes is more difficult to manage and that NAFLD is more likely to progress. As NAFLD represents a spectrum from simple steatosis through to cirrhosis and is itself diagnosed by a variety of methods, it is no surprise that there is considerable heterogeneity within the epidemiological studies. Screening asymptomatic diabetic patients for NAFLD remains controversial and there are concerns both about the volume of unrecognised severe NAFLD as well as the management and health economic realities of making this diagnosis.

In the present study we have undertaken total 50 patients with diabetes mellitus (both type 1 and Type 2) among which more were females and male is to female ratio was 1 : 4. In our study The prevalence of fatty liver in this study was found to be 42%. According to a study conducted by Daad H. Akbar, the prevalence of NAFLD was found to be 55%.[6] Another study conducted by Gupta P et al the prevalence of NAFLD, by ultrasound examination, was found to be 49%.[7]

Wanless and Lentz found mild to severe steatosis in approximately 70% of obese patients and 35% of lean patients.[8] which was nearly equal to found in our study. Another study by Gupta P et al found NAFLD among obese patients.

The prevalence of fatty liver was found to be higher among women (38.6%) than men. Many studies have found the presence of fatty liver to be higher in women.[9,6]

NAFLD and NASH have been described in patients without the classic risk factors of obesity, diabetes and overt hyperlipidaemia. It has been described in patients with central of visceral adiposity in a study conducted by Bacon BR et al.[10] In another study, fatty liver was strongly correlated with visceral adipose tissue.48In this study the percentage of patients with central obesity among patients with fatty liver was 100% and those with a waist hip ratio of >1 was 75%.

The no. of patients with increased triglycerides and cholesterol was found to be 91% and 67% respectively. As mentioned earlier two thirds of patients with hypertriglyceridemia and one third of patients with hypercholesterolemia have fatty liver.[11]

CONCLUSION

From overall observation and discussion with other studies we can conclude that, prevalence of NAFLD was observed mainly in patients with type 2 diabetes mellitus and also it was found more common among women compared to men. NAFLD was found to higher in patients who were overweight or obese, in those with central obesity.

Conflict of Interest: None

Funding: None

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