

A Study of Prevalence of Non Alcoholic Fatty Liver in Type 2 Diabetes Mellitus Patients

I Rohini¹, N Aarthi²

ABSTRACT

Background: NAFLD is commonly associated with Type 2 diabetes mellitus in clinical practice it is overlooked despite the significant clinical implications of NAFLD in Type 2 diabetes mellitus. This study was done to estimate the prevalence of NAFLD in diabetes mellitus.

Material and methods: This study was conducted in 150 patients with Type 2 diabetes mellitus in Chengalpattu medical college over a period of 1 year. This study was a cross sectional non interventional study.

Results: The prevalence of NAFLD was 51.3% and the prevalence was higher among females (42.6%) and higher in patients with central obesity and dyslipidemia.

Conclusion: Since NAFLD is a common association with diabetes mellitus and the risk of complications is higher in patients with NAFLD, early detection is needed to adopt preventive strategies.

Keywords: Non Alcoholic Fatty Liver, Type 2 Diabetes Mellitus, Central Obesity, Hypertriglyceridemia.

INTRODUCTION

NAFLD is one of the commonest causes of chronic liver disease. With rising rates of obesity and diabetes mellitus the prevalence of NAFLD has risen. Since most of the patients with NAFLD are asymptomatic the prevalence of NAFLD is underestimated. The global prevalence of NAFLD in type 2 diabetes mellitus ranges from 34 - 94%.¹ The prevalence of NAFLD is in the increasing trend in obese adult patients and ranges between 34-46% in developed countries.² The diagnosis is based on liver function test, liver biopsy and imaging of liver. Most studies have shown that NAFLD is common in men and the prevalence in women increases with increasing age.³ NAFLD has been included as the hepatic component of metabolic syndrome which should encompass three or more of the above criteria (ie) hypertriglyceridemia, hypertension, abdominal obesity, decreased levels of HDL and increased fasting plasma glucose levels.

Ethnicity also plays a role. It is more prevalent in Hispanics.⁴ It is because of their intake of food with high carbohydrate content. Sedentary lifestyle and increased consumption of soda containing syrups also contribute.

Genetic influences like single nucleotide polymorphisms in specific genes like palatin linked phospholipase domain containing protein – 3 increase the risk of developing NAFLD. This gene has been implicated in regulation of triacylglycerol synthesis.

The characteristic feature of NAFLD is accumulation of macrovesicular fat in > 5% of hepatocytes. The spectrum of NAFLD ranges from simple steatosis to steatohepatitis

(NASH) to cirrhosis to hepatocellular carcinoma. Most of the patients with NAFLD have hepatic steatosis without necrosis and fibrosis. The criteria for NAFLD includes ballooning degeneration of hepatocytes and inflammatory cell infiltrate into lobules, Mallory bodies, Periodic acid Schiff diastase resistant kupffer cells and vacuolated nuclei.⁵ NAFLD is due to insulin resistance and triglyceride accumulation in liver and hypertriglyceridemia.^{6,7}

Starvation, rapid weight loss and total parental nutrition may also result in NAFLD. Bariatric surgeries, jejunioileal bypass and small bowel resection also result in hepatic steatosis.

This study was done to estimate the prevalence of NAFLD in diabetes mellitus.

MATERIAL AND METHODS

A total of 150 patients including inpatients and outpatients from October 2017 to September 2018 from Chengalpattu medical college were studied.

Inclusion criteria

Male and female patients with Type 2 diabetes mellitus of more than 1 year duration and on treatment were included in the study

Exclusion criteria

1. Patients with alcohol consumption of more than 20 gram per day.
2. Patients with chronic liver disease were excluded from the study
3. Patients with drug induced hepatitis.
4. Malignancies.
5. Patients with congenital liver diseases.

150 Patients with Type 2 diabetes mellitus were studied for one year period. The study group consisted of 58 males and 92 females.

After obtaining informed consent from patients a complete history taking and physical examination were performed. The data collected included age, sex, BMI, waist – hip ratio, liver function test, serum cholestrol, triglycerides and USG

¹Associate Professor, Department of Medicine, Govt Stanley Medical College, Chennai, Tamil Nadu, ²Senior Resident, ESIPGIMS, KK Nagar, Chennai, Tamil Nadu, India

Corresponding author: Dr I Rohini, 3/634, Jaganathan street, Kottivakkam, Chennai- 600041, India

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abdomen. Screening for HCV and HBsAg was done and was found to be negative. The above investigation were done in these patients

- BMI
- Waist - hip ratio
- Liver function test
- Lipid profile
- Abdominal ultrasonography

Ultrasound evidence of hepatic steatosis was looked for Grade-1: slightly increased liver echogenicity with normal vessels and absence of posterior attenuation.

Grade-2: moderate increase in liver echoes with partial dimming of vessels and early posterior attenuation.

Grade-3: diffuse increase in echogenicity and absence of visible vessels and increased posterior attenuation.

RESULTS

150 patients were enrolled in the study of which 92 patients were female and 52 patients were male (Figure 1). Age distribution of the patients were from 30 – 82 years. Majority

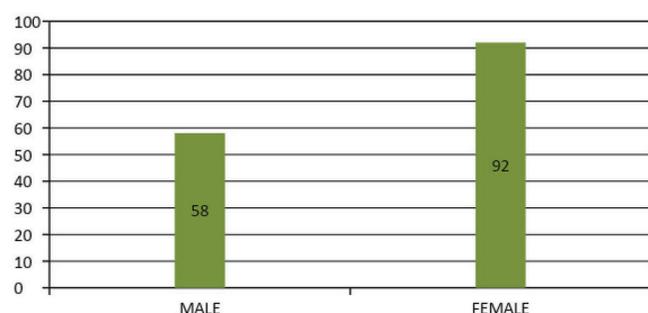


Figure-1: Sex distribution

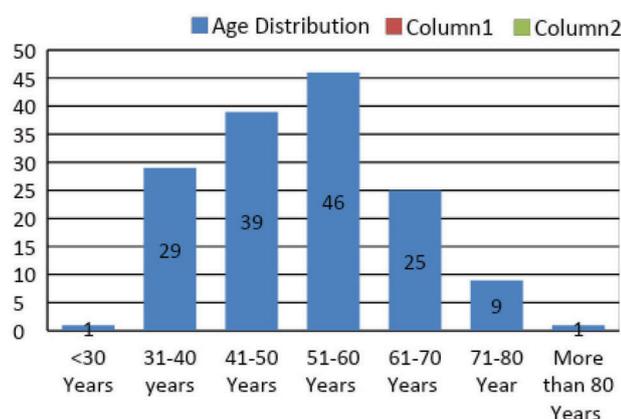


Figure-2: Age distribution

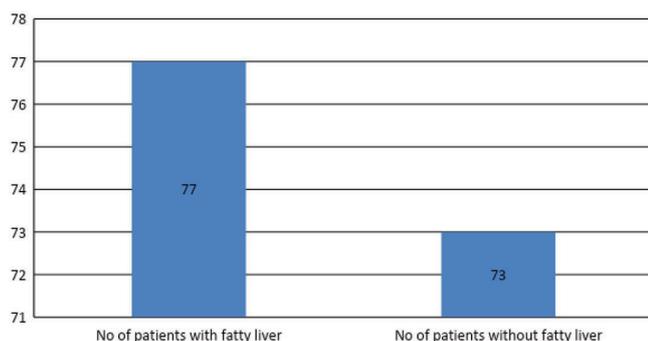


Figure-3: No of patients with fatty liver

of the patients were in the age group of 51 -60 years (Figure 2).

By USG hepatic steatosis was found in 77 patients (51.3%) (Figure 3). Out of 58 males, 13 males (8.6%) had fatty liver. Among 92 female patients 64 females (62.2%) had fatty liver (Table 2). Among 77 patients with hepatic steatosis the age distribution showed that most of them were between 41 to 50 years (30.8%) (Figure 5).

The number of patients with fatty liver who had increased weight hip ratio was 66(44%) (Figure 6). Among this the prevalence was higher in females 56 (72.8%). And in males it was 10(12.9%). BMI more than 25 was found in 62 patients

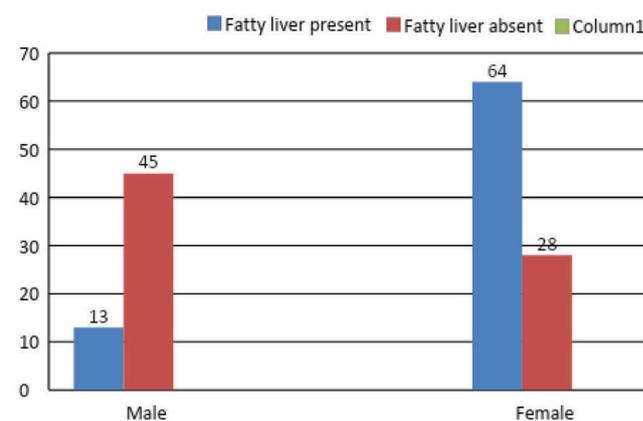


Figure-4: Sex distribution of patients with fatty liver

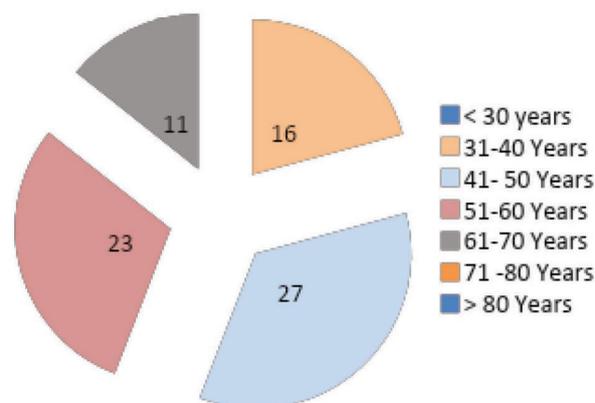


Figure-5: Age distribution among patients with fatty liver

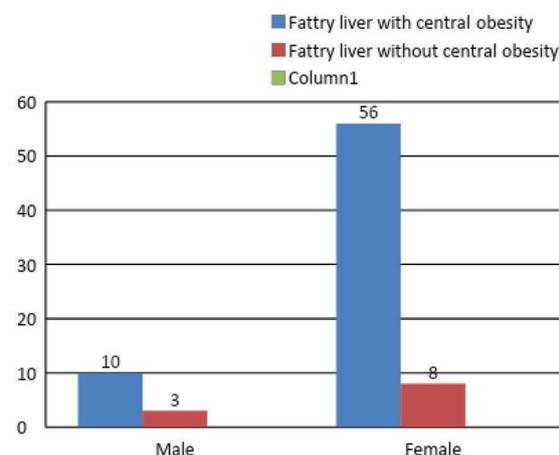


Figure-6: No of patients with fatty liver who had central obesity

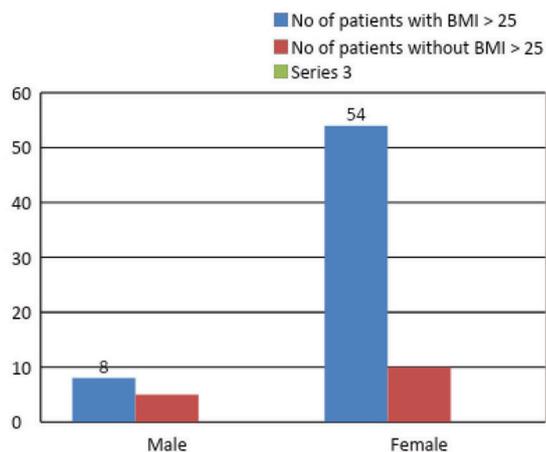


Figure-7: No of patients with fatty liver who were over weight

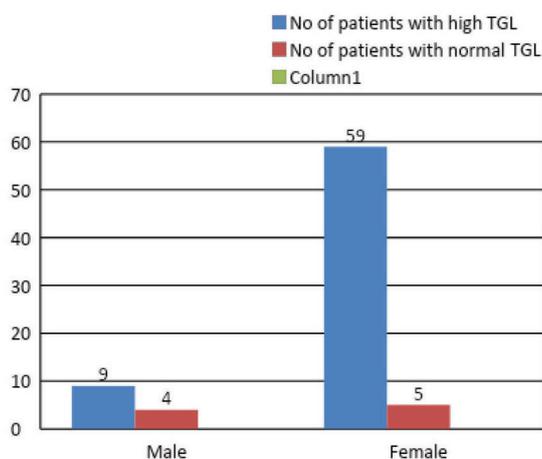


Figure-8: No of patients with fatty liver who had hypertriglyceridemia

(80.5%) which comprises of 8 males (10.4%) and 54 females (70.1%) (Figure 7). Among 77 patients with fatty liver 68 patients (89.3%) had hypertriglyceridemia which comprises of 9 males (11.7%) and 59 females (77.6%) (Figure 8).

All patients with ultrasound evidence of fatty liver had marginally raised transaminases. There was no alteration in serum protein or albumin globulin ratio.

DISCUSSION

The prevalence of NAFLD is increasing globally. Many studies have shown positive relationship between abnormal glucose tolerance, hypertriglyceridemia, central obesity and NAFLD. The prevalence of NAFLD in Type 2 diabetes mellitus in our study is 51.33%. There is significance rise in the prevalence of NAFLD in Individuals with type 2 diabetes mellitus. This observation stresses the importance of early evaluation and management of NAFLD. In a study conducted by Yi et al the prevalence of NAFLD higher in males when compared to female.⁸ In our study the prevalence of NAFLD in type 2 diabetes mellitus is higher in female patients. A similar trend was observed by S. Kalra et al in which the prevalence of NAFLD is higher in females.⁹

One of the important factors attributed in NAFLD is obesity. In our study 80.5% of patients with NAFLD had higher BMI. Bhatt. K et al reported that BMI was higher in

patients with NAFLD when compared to individuals without NAFLD.¹⁰ BMI is a marker of obesity and it correlates with development of fatty liver.

Many studies have shown that there is an increase in prevalence of NAFLD in older individuals with more no of patients falling in the age group of 40-60 years. Our study also observed the same with more number of patients in the age group of 41-50 years followed by age group of 51-60 years.

Dyslipidemia is a risk factor for the development of NAFLD. Many studies have shown that 20-92% of patients have hyperlipidemia, increased triglycerides, increased cholesterol or both.¹¹

In our study 89.3% of patients had hypertriglyceridemia. Many of the studies have found that there is no correlation between the prevalence of NAFLD in patients with type 2 type 2 diabetes mellitus and transaminase levels.¹¹ A study conducted by Lu et al shoed that transaminase levels were raised in patients with NAFLD with type 2 diabetes mellitus.¹² Our study showed that there was a minimal increase in transaminase levels in patients in with NAFLD. Gupte et al observed that mild, moderate and severe degree of NAFLD was found in 65%, 12.5%, and 92.5% of individuals with type 2 diabetes mellitus.¹³ Banerjee et al showed that on liver biopsy fatty changes were observed in 43%, cirrhosis in 20% and NASH in 40% of patients with type 2 diabetes mellitus.¹⁴

Limitation

This study lacks histological evidence for hepatic steatosis and imaging modality like MRI spectroscopy

CONCLUSION

Prevalence of NAFLD is increasing globally. It is associated with other components of metabolic syndrome. Our study showed a higher prevalence of NAFLD among patients with Type 2 diabetes mellitus stressing the need for preventive strategies.

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