

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

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Conflict of interest: Nil

Abstract:

Background: Despite having important clinical consequences for Type 2 diabetes mellitus, non-alcoholic fatty liver disease (NAFLD) is frequently disregarded in clinical practice. To determine the prevalence of NAFLD in people with diabetes mellitus, this study was conducted.

Methods: Between August 2016 and July 2017, 150 patients with Type 2 diabetes mellitus were included in this study, which was carried out in the medicine department of Darbhanga Medical College and Hospital in Laheriasarai, Bihar. The present study was non-interventional and cross-sectional.

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

Conclusion: Given that NAFLD and diabetes mellitus are frequently associated, and that patients with NAFLD have a higher risk of complications, early identification is essential in order to implement preventive measures.

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

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Introduction

One of the most frequent causes of chronic liver disease is NAFLD. The prevalence of non-alcoholic fatty liver disease has increased along with obesity and diabetes mellitus rates. The prevalence of NAFLD is underestimated as the majority of its patients are asymptomatic. Between 34 and 94% of people with type 2 diabetes worldwide have NAFLD. [1]

In obese adult patients, the prevalence of non-alcoholic fatty liver disease (NAFLD) is on the rise and varies from 34 to 46% in developed nations. [2] Liver function tests, liver biopsies, and liver imaging are used to make the diagnosis.

According to the majority of research, NAFLD is more common in men and becomes more prevalent in women as they age.[3] The hepatic component of metabolic syndrome, which includes hypertension, hypertriglyceridemia, abdominal obesity, decreased HDL levels, and elevated fasting plasma glucose levels, has been defined as NAFLD.

Ethnicity is another factor. Hispanics are more likely to have it. [4] Their consumption of foods heavy in carbohydrates is the reason behind this. Increased use of syrups containing soda and a

sedentary lifestyle are also factors. NAFLD risk is increased by genetic factors such as single nucleotide polymorphisms in particular genes, such as palatin linked phospholipase domain containing protein-3. Triacylglycerol production regulation has been linked to this gene.

More than 5% of hepatocytes have an accumulation of macrovesicular fat, which is a defining hallmark of NAFLD. NAFLD encompasses a wide range of conditions, including cirrhosis, hepatocellular carcinoma, steatohepatitis (NASH), and simple steatosis. The majority of NAFLD patients have hepatic steatosis without fibrosis or necrosis.

The ballooning degeneration of hepatocytes and the infiltration of inflammatory cells into lobules, Mallory bodies, periodic acid Schiff diastase-resistant kupffer cells, and vacuolated nuclei are among the criteria for nonalcoholic fatty liver disease. [5] The causes of NAFLD include hypertriglyceridemia, triglyceride build-up in the liver, and insulin resistance. [6,7]

NAFLD can also be brought on by complete parental nourishment, fast weight loss, or starvation. Hepatic steatosis is also a consequence

of small bowel resection, jejunioileal bypass surgery, and bariatric surgery.

To determine the prevalence of NAFLD in people with diabetes mellitus, this study was conducted.

Material and Methods

This cross-sectional non-interventional study was conducted at Darbhanga Medical College and Hospital, Laheriasarai, Bihar from August 2016 to July 2017. A total of 150 patients including inpatients and outpatients medicine department of DMCH, Laheriasarai, Bihar. Male and female patients with Type 2 diabetes mellitus of more than 1 year duration and on treatment were included in the study, patients with alcohol consumption of more than 20 gram per day, chronic liver disease, drug induced hepatitis, malignancies and congenital liver diseases were excluded from the study.

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 cholesterol, triglycerides and USG 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

Out of the 150 patients that were enrolled in the trial, 52 were male and 92 were female (Figure 1). The patients' ages ranged from 30 to 82 years old. The age range of 51 to 60 years old comprised the majority of the patients (Figure 2).

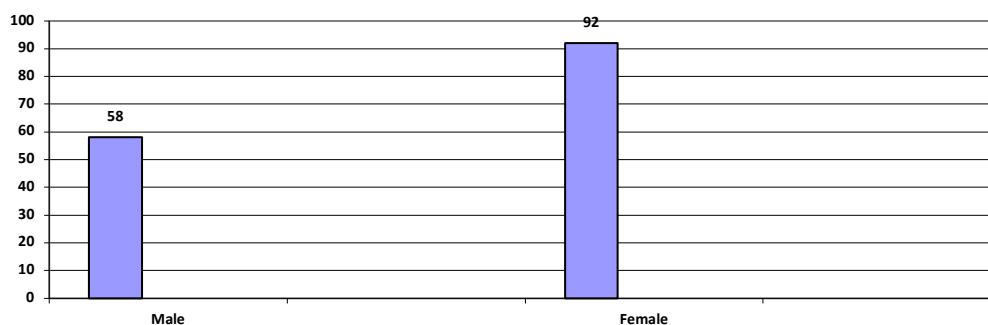


Figure 1: Sex Distribution

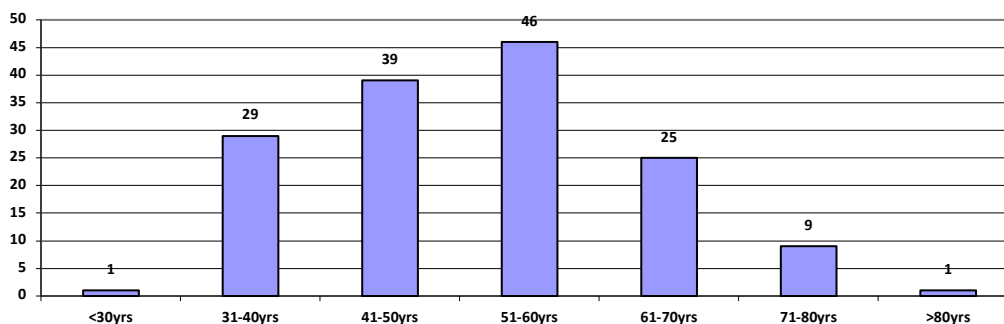


Figure 2: Age Distribution

77 patients (51.3%) had hepatic steatosis according to USG (Figure 3). Thirteen males (8.6%) out of the 58 males had fatty livers. 64 female patients (62.2%) out of 92 female patients had fatty liver (Table 2). The age distribution of the 77 patients with hepatic steatosis revealed that 30.8% of them were between the ages of 41 and 50 (Figure 5).

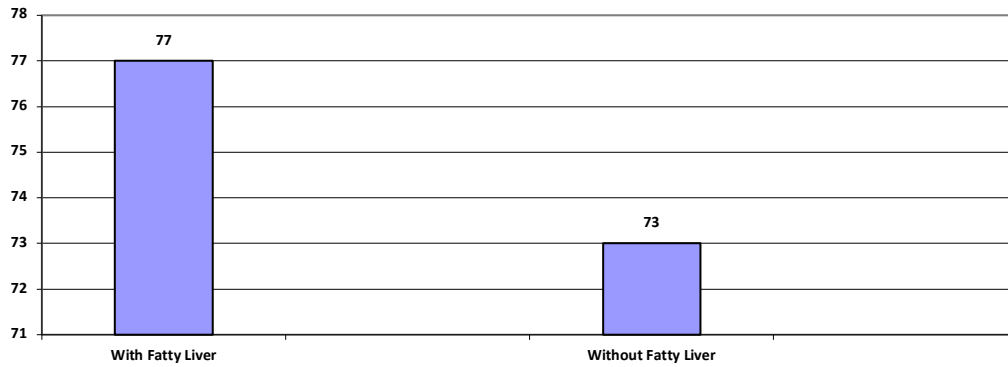


Figure 3: Number of patients with fatty liver

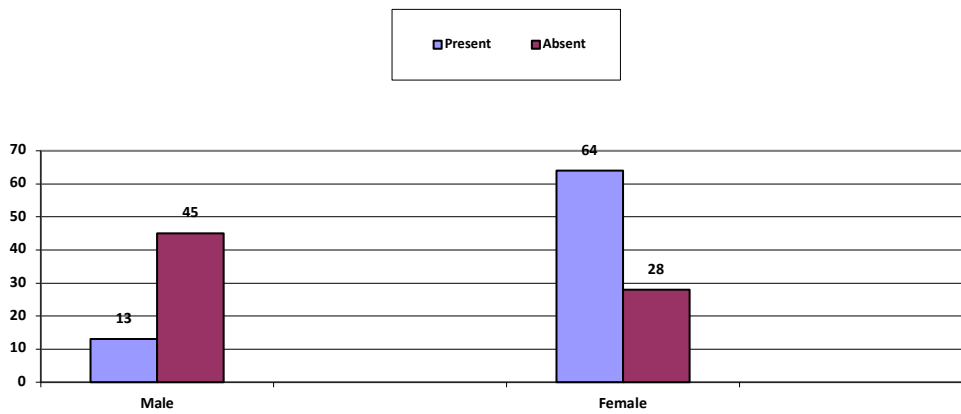


Figure 4: Sex distribution of patients with fatty liver

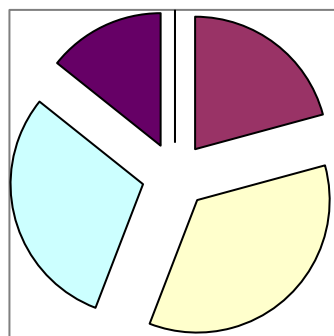
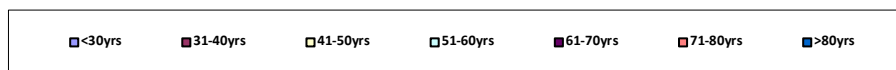


Figure 5: Age distribution among patients with fatty liver

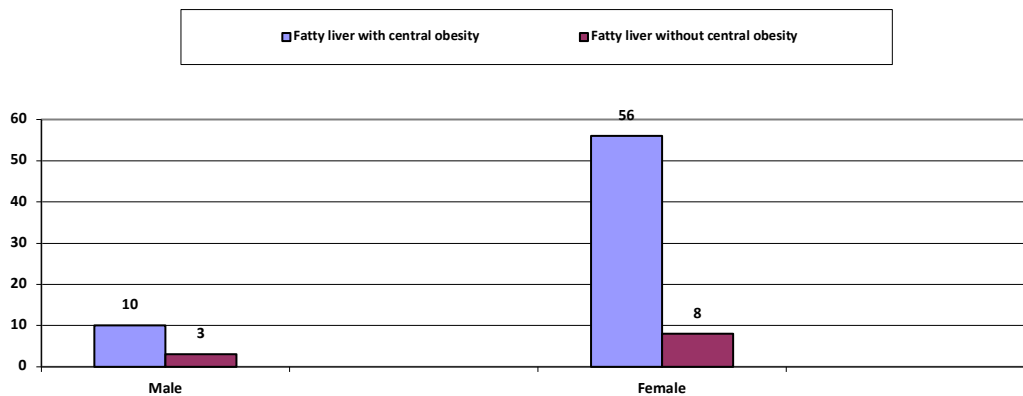


Figure 6: No. of patients with fatty liver who had central obesity

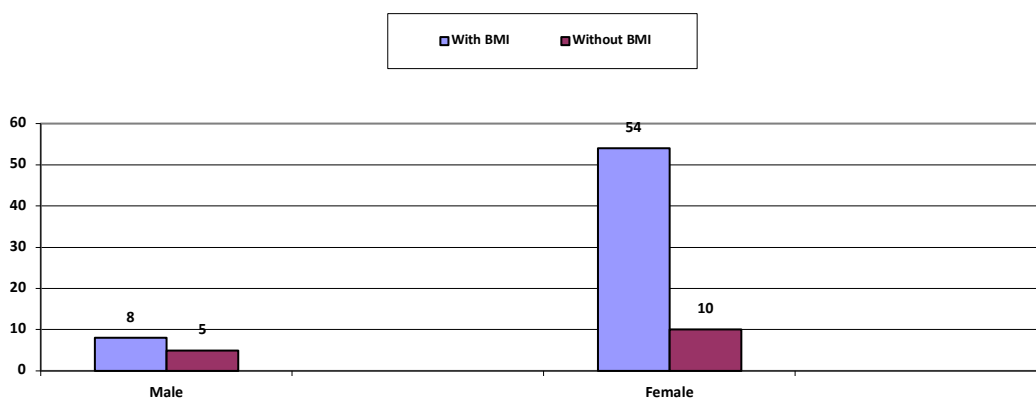


Figure 7: No. of patients with fatty liver who were over weight

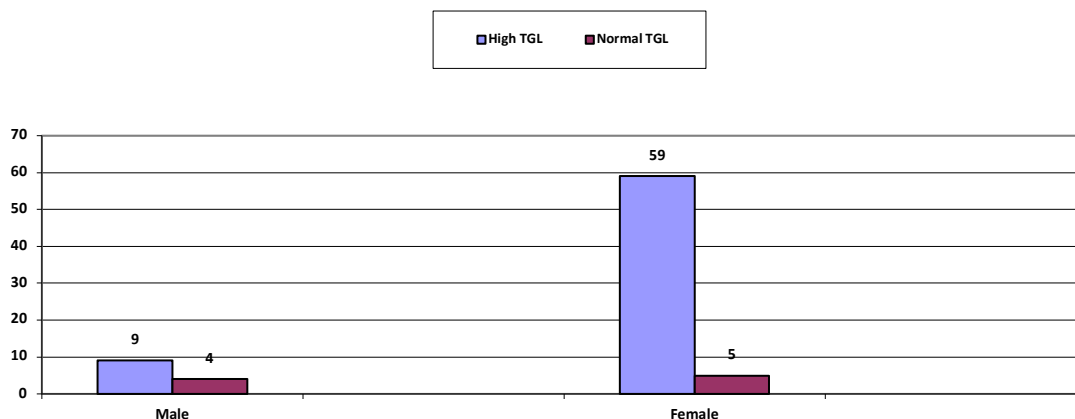


Figure 8: No. of patients with fatty liver who had hypertriglyceridemia

Figure 6 show that 66 patients (44%) with fatty liver also had an elevated weight-hip ratio. Of them, 56 females (72.8%) had a greater prevalence. And it was 10(12.9%) in men.

Eight males (10.4%) and fifty-four females (70.1%) make up the 62 patients (80.5%) with BMIs more than 25 (Figure 7). Nine men (11.7%) and fifty-five females (77.6%) out of the seventy-seven patients with fatty liver (89.3%) exhibited

hypertriglyceridemia (Figure 8).Transaminases were slightly elevated in all patients with fatty liver detected by ultrasonography.

The albumin globulin ratio and serum protein levels were unchanged.

Discussion

Globally, NAFLD is becoming more common. Abnormal glucose tolerance, hypertriglyceridemia,

central obesity, and non-alcoholic fatty liver disease (NAFLD) have all been positively correlated in numerous studies. 51.33% of people with Type 2 diabetes mellitus in our study had NAFLD. The frequency of non-alcoholic fatty liver disease (NAFLD) has significantly increased among those with type 2 diabetes. This observation emphasizes how critical it is to assess and treat NAFLD as soon as possible. According to a study by Yi et al, men were more likely than women to have NAFLD. [8] According to our research, female patients with type 2 diabetes mellitus had a higher prevalence of NAFLD. Similar findings were made by S. Kalra et al., who found that women are more likely than men to have NAFLD. [9]

Obesity is one of the major variables linked to NAFLD. Eighty-five percent of the NAFLD patients in our study had higher BMIs. According to Bhatt, K. et al., patients with NAFLD had higher BMIs than people without the condition. A BMI of indicates obesity and is associated with the onset of fatty liver. [10]

Many studies have demonstrated that the prevalence of non-alcoholic fatty liver disease (NAFLD) is rising among the elderly, with a greater number of patients falling within the 40–60 age range. The age group of 41–50 years old had the highest number of patients in our study, followed by the 51–60 year old age group.

One of the risk factors for the onset of NAFLD is dyslipidemia. Numerous investigations have demonstrated that 20–92% of individuals suffer from hyperlipidemia, elevated cholesterol, elevated triglycerides, or both. [11]

89.3% of the participants in our study exhibited hypertriglyceridemia. Numerous investigations have discovered no relationship between transaminase levels and the frequency of NAFLD in individuals with type 2 diabetes mellitus. [11] According to a study by Lu et al., patients with type 2 diabetes mellitus and NAFLD had elevated transaminase levels. [12] According to our research; patients with NAFLD had a little increase in transaminase levels. Gupta et al. reported that 65%, 12.5%, and 92.5% of those with type 2 diabetes mellitus had mild, moderate, or severe NAFLD, respectively. [13] According to research by Banerjee et al., among individuals with type 2 diabetes mellitus, fatty alterations were seen in 43% of cases, cirrhosis in 20%, and NASH in 40%. [14]

Conclusion

Globally, the prevalence of NAFLD is rising. It is connected to further metabolic syndrome components. The need for preventive measures is highlighted by our study's finding that patients with

Type 2 diabetes mellitus had a greater prevalence of NAFLD.

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