

Original Research Article

A cross sectional study to determine the prevalence and risk factors of non alcoholic fatty liver diseases among diabetics I and II

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ABSTRACT

Background: Non Alcoholic Fatty Liver Disease (NAFLD) is an important health problem globally as well as in India. The present was taken to determine the prevalence of NAFLD among diabetics attending a tertiary care hospital in Telangana.

Methods: A total of 75 subjects who were all diabetics were taken. The diagnosis of NAFLD was done using Ultra sonogram. Preliminary information along with duration of diabetes, Waist Hip Ratio, Body Mass Index, Triglycerides and Cholesterol was collected and analyzed.

Results: The prevalence of NAFLD among diabetics was 41.3%. Majority of the subjects belonged to age group of 41-60 years. The prevalence of NAFLD among females was 35.99%. Among patients who had Non-alcoholic fatty liver disease 74.19% had Waist Hip ratio >1. Almost 90.3% had higher levels of triglycerides (>180 mg/dl).

Conclusions: The prevalence of NAFLD among diabetics was comparatively high. Early diagnosis, treatment, awareness and education is needed to reduce the burden of NAFLD.

Keywords: Body mass index, Diabetes mellitus, Non-alcoholic fatty liver disease, Triglycerides and cholesterol, Waist hip ratio

INTRODUCTION

India is the capital home to 69.1 million people with Diabetes Mellitus (DM), the second highest after China. Recent epidemiological surveys indicate a fast rising of DM epidemic across the affluent and the poor communities in India.¹ The prevalence of DM according to a survey was found to be 11.6% and the incidence i.e. yearly new annual case rate was found to be 7.1%.^{2,3} Diabetes mellitus is a metabolic disease that causes raise in blood sugar levels. Untreated high blood sugar from diabetes leads to end organ damage. The most commonly affected organs include nerves, eyes, kidneys, vessels etc. In type 1 DM, for some reason, the immune system mistakenly attacks and destroys insulin-producing beta cells in the pancreas, leading to deficiency of Insulin and

deranged blood sugar levels. Type 2 DM stems a combination of genetics and lifestyle factors. Being overweight or obese increases the risk of insulin resistance. This condition runs in families. Family members share genes that make them more likely to get type 2 DM and to be overweight.⁴

Non-Alcoholic Fatty Liver Disease (NAFLD) is excessive fat in the liver with insulin resistance due to causes other than alcohol use.⁵ Two types: non-alcoholic fatty liver (NAFL) and Non-Alcoholic Steatohepatitis (NASH). It may lead to complications such as cirrhosis, liver cancer, liver failure, or cardiovascular disease. Previous literature reported the existence of liver damage with fibrosis and early cirrhosis in obese patients without a significant history of alcohol consumption. The

association was widely attributed at that time to protein calorie malnutrition or intestinal bacterial overgrowth, although a correlation between obesity and diabetes and possible liver damage was not strongly emphasized. Obesity, type 2 diabetes and hyperlipidemia have been the most constant conditions associated with steatosis and steatohepatitis and are predictors of more severe histologic disease. Diabetes was also identified as an independent risk factor for NASH. Hypertriglyceridemia is also identified as an independent predictor of steatosis at liver ultrasound imaging.⁶

Objectives of study was to assess the prevalence of Non-Alcoholic Fatty Liver Disease (NAFLD) among study population and to determine the risk factors for Non-Alcoholic Fatty Liver Disease (NAFLD) among study population.

METHODS

It is a cross sectional Hospital based descriptive study, for the study period of two years from October 2013-October 2015 in MNR Medical College - Tertiary care centre, Sangareddy, Telangana, India

A sample of 75 diabetic subjects was calculated using prevalence as 57.15% from a previous study.⁷ Diabetics who attended outpatient department in the hospital were taken.

Inclusion criteria

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

Exclusion criteria

- Those who were not willing to be a part of the study.
- 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).

A pre-designed, pre-tested, semi-structured questionnaire was used as a study tool.

The data was collected by interview method by asking the questions from the questionnaire and thorough physical examination and lab findings were documented wherever necessary.

RESULTS

A total of 75 subjects were included in the study that had diabetes. The study consisted of 20 males and 55 females (Figure 1).

Out of the 75 subjects who had diabetes 31 (41.3%) subjects had fatty liver and 44 (58.7%) did not have NAFLD. The prevalence in this study for NAFLD among diabetics was found to be 41.3% (Table 1).

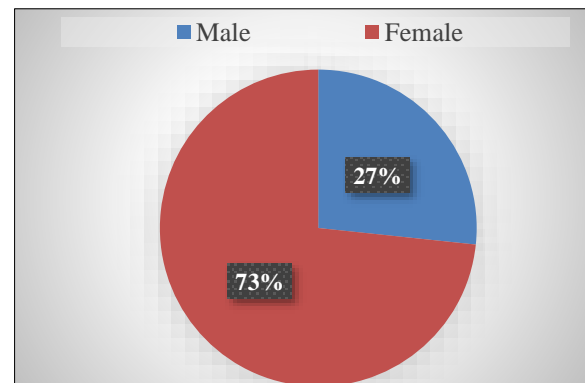


Figure 1: Distribution of subjects according to sex (n=75).

Among the sexes out of 20 males only 4 had fatty liver and of the 55 female subjects 27 females had fatty liver. This study shows and suggests females are more prone to fatty liver disease than males (Table 1).

Table 1: Distribution of all the diabetic subjects according to sex based on fatty and non-fatty liver (n=75).

Gender	Fatty liver disease	Non-fatty liver disease	Total (%)	p value
Male	4(20%)	16(80%)	20(100)	0.01*
Female	27(49.1%)	28(50.9%)	55(100)	
Total	31(41.3%)	44(58.7%)	75(100)	

*p value - 0.01; statistically highly significant

Table 2: Distribution of age among the subjects (n=75).

Age group (years)	Number	Percentage
11-20	1	1%
21-30	1	1%
31-40	9	9%
41-50	35	35%
51-60	37	37%
61-70	13	13%
>70	4	4%
Total	75	100%

Majority of the subject's i.e. 37% belonged to the age group 51-60 years, 35% subjects belonged to 41-50 years age group. Almost 13% and 9% subjects belonged to 61-70 years and 31-40 years age group. Around 4% of subjects were above the age of 70 years and 2% belonged to 11-30 years (Table 2).

Out of 75 subjects 31 had NAFLD, among the 31 subjects 23 subjects (74.2%) had a WHR of >1 and 8

subjects (25.8%) WHR was <1. Similarly the BMI's were compared of the 31 NAFLD subjects 21 subjects (67.7%) had a BMI >25 and 10 subjects (32.3%) had BMI <25 as shown in (Table 3).

Table 3: Distribution of study population according to WHR, BMI, TG and TC (n=31).

Parameter	Values	Number (%)
Waist Hip Ratio	>1	23(74.2)
	<1	08(25.8)
Total		31(100)
Body Mass Index	>25	21(67.7)
	<25	10(32.3)
Total		31(100)
Triglycerides	>150 mg/dl	28(90.3)
	<150 mg/dl	03(9.7)
Total		31(100)
Total Cholesterol	>200 mg/dl	20(64.5)
	<200 mg/dl	11(35.5)
Total		31(100)

When Triglyceride's (TG) and total cholesterol (Table 3) were evaluated of the 31 subjects 28 subjects (90.3%) had elevated triglyceride level and 3 subjects (9.7%) had normal TG levels, 20 subjects (64.5%) had total cholesterol >200 mg/dl and 11 subjects (35.5%) had cholesterol <200 mg/dl.

DISCUSSION

The present study, prevalence of NAFLD was 41.3%. Studies conducted by Anindo Majumdar et al, the prevalence was 30.7%.⁸ Another study by Mohan et al, the prevalence was 32%.⁹ In a study conducted in neighbor country Sri Lanka by Dassanayake et al, the prevalence reported in that study was 32.6%.¹⁰

In this study females were predominantly affected with NAFLD i.e 87.09% than males 12.9%. In a hospital based study conducted by Bajaj et al, prevalence reported was 32.2% and 24.2% for females and males respectively.¹¹ The study was similar to authors study where women are affected more. The drawback of the present study is the sample size was small that is the reason for higher percentage in females.

In present study 23 subjects had WHR >1 and 8 subjects had <1. As evident 3/4th subjects with NAFLD had higher WHR. A study conducted by Eshraghiyan et al, also had similar results.¹² So mainly a conclusion can be made that WHR is a risk factor in NAFLD persons. In another study conducted Anindo M, Puneeth M et al, suggested high risk of NAFLD was significantly higher among participants who had higher waist circumference.⁸

As BMI is important risk factor or a predictor this study had 21 subjects with BMI >25. Das et al, showed individuals with BMI >18.5 had two fold increase in

development of NAFLD.¹³ In another study by Rentapalli Babu Rao, Siraj Amhed K et al, shows higher the BMI higher the risk of NAFLD.¹⁴

The triglycerides were analyzed in this study and showed majority of the subjects had TG levels > 150mg/dl. Study done by Nengguang Fan, Liang Peng et al, TG was independently associated with the risk of NAFLD.¹⁵ Study also is in similar findings. With regard to Cholesterol, many epidemiological studies have identified cholesterol as a factor related to the risk and severity of NAFLD.^{16,17} Study also represents the same trend (20 subjects) had elevated cholesterol levels.

CONCLUSION

The cross sectional descriptive study was conducted on 75 diabetic subjects and the prevalence of NAFLD is 41.3%. The other contributable risk factors like WHR, BMI, TG and Cholesterol were also found as major predictors in NAFLD among diabetics. Subjects with higher WHR (>1), BMI (>25), TG (>150mg/dl) and cholesterol (>200mg/dl) have a higher risk of NAFLD.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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