

Research Article

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## Prevalence of diabetes, hypertension, dyslipidemia and obesity in patients of non alcoholic fatty liver

**Dr. Sara Siddiqui, Dr. Seema Singh, Dr. Archana Sarma, Dr. Abdussalam, Dr. Eqbal Anwer, Dr. Pooja Ojha, Dr. Samreen Farooqui, Dr. Avadh Kapoor.**

Department of Physiology, Era's Lucknow Medical College & Hospital, Lucknow

\*Corresponding author: **Dr. Sara Siddiqui**, Department of Physiology, Era's Lucknow Medical College & Hospital, Lucknow.

E-mail: [drmamzarulkgmc@gmail.com](mailto:drmamzarulkgmc@gmail.com)

### Abstract

**Background:** Non alcoholic fatty liver disease encompasses a spectrum of hepatic pathology, ranging from simple steatosis (also called as non alcoholic fatty liver) in most benign form to cirrhosis in its most advanced form. Non-alcoholic fatty liver disease is now recognized as the most common liver disease in the United States, with a prevalence of approximately 5% in the general population and up to 25% to 75% in patients with obesity and type II diabetes mellitus. However, prevalence in general Indian population varies from 9 to 32 %.

**Materials and Methods:** This study was conducted in Department of Physiology in Association with Department of Medicine and Department of Radiology, Era's Lucknow Medical College and Hospital. Included Admitted patients having fatty liver finding on ultrasound. Patients with any history of alcohol abuse and viral hepatitis were excluded. A total of 65 patients were included.

**Results:** Diabetes was the most common finding (n=41; 63.1%) followed by hypertension (n=37; 56.9%), obesity (n=34; 52.3%) and dyslipidemia (n=30; 46.2%) respectively.

**Conclusion:** In present study, 60% were male non-alcoholic fatty liver disease patients and 40% were female non-alcoholic fatty liver disease patients. Thus present study shows that non-alcoholic fatty liver disease is more common in males. In present study, majority of non-alcoholic fatty liver disease patients were in 50 and above age group. In the present study, diabetes was the most common finding (n=41; 63.1%) followed by hypertension (n=37; 56.9%), obesity (n=34; 52.3%) and dyslipidemia (n=30; 46.2%) respectively.

### Keywords

non-alcoholic fatty liver disease, dyslipidemia.

### Introduction

Non alcoholic fatty liver disease encompasses a spectrum of hepatic pathology, ranging from simple steatosis (also called as non alcoholic fatty liver) in most benign form to cirrhosis in its most advanced form.<sup>1</sup>

Non-alcoholic fatty liver disease is now recognized as the most common liver disease in the United States, with a prevalence of approximately 5% in the general population and up to 25% to 75% in patients with obesity and type II diabetes mellitus.<sup>2</sup>

However, prevalence in general Indian population varies from 9 to 32 %.<sup>3</sup>

Non alcoholic fatty liver disease is a clinicopathologic syndrome with a wide spectrum of histologic abnormalities and clinical outcomes. Hepatic steatosis has a benign clinical course. In contrast, Non-Alcoholic Steatohepatitis (NASH) may progress to cirrhosis and liver-related death in 25% and 10% of patients, respectively. Cases occur most commonly in obese, middle-aged women with diabetes. However, NASH may also occur in children and normal weight men with normal glucose and lipid metabolism.

**Fatty liver can be graded on the basis of USG as follows<sup>4</sup>:**

Sonographic patterns included the following:

**Grade 0:** Homogeneous, normal

**Grade 1:** Hyperechoic nodules

**Grade 2:** Multiple, confluent hyperechoic lesions

**Grade 3:** Hypoechoic skip nodules

**Grade 4:** Irregular hyperechoic and hypoechoic areas

**Grade 5:** Diffuse involvement

Nonalcoholic fatty liver disease (NAFLD) is emerging as an important cause of liver disease in India. Epidemiological studies suggest prevalence of NAFLD in around 9% to 32% of general population in India with higher prevalence in those with overweight or obesity and those with diabetes or prediabetes.<sup>3</sup>

## Materials and Methods

**Study Center:** This study was conducted in Department of Physiology in Association with Department of Medicine and Department of

Radiology, Era's Lucknow Medical College and Hospital.

**Type of study:** Cross-sectional study.

**Study period** = 18 months. After enrollment following details were noted and relevant investigations were performed:

- **Height** was measured using stadiometer in cms.
- **Weight** in kg.
- **Body mass index**= weight in kg/ height in m<sup>2</sup>.

**Inclusion criteria:** Included Admitted patients having fatty liver finding on ultrasound.

**Exclusion criteria:** Any history of alcohol abuse and viral hepatitis.

Sample size of total 65 patients was taken.

**Diagnosis of type 2 diabetes mellitus** according to ADA criteria<sup>5</sup> which is:

- Symptoms of diabetes plus random blood glucose concentration more than equal to 11.1mmol/L (200mg/dl)
- Fasting plasma glucose more than 7.0mmol/L(126mg/dl)

Two hour plasma glucose more than equal to 11.1mmol/L(200mg/dl) during an oral glucose tolerance test

**Hypertension is defined as under<sup>6</sup>:**

- Systolic blood pressure more than 140mm Hg
  - Diastolic blood pressure more than 90 mm Hg
- Or
- Increase in either systolic or diastolic blood pressure was taken as hypertension.

**Ultrasonography:** (3.5 MHz machine from GE Voluson P8) was done to screen fatty liver.

Results

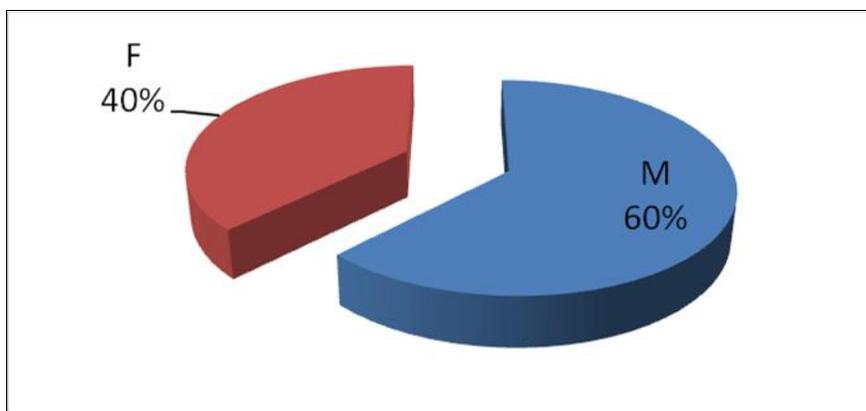


Figure 1 shows percentage prevalence of non-alcoholic fatty liver diseases cases in males and females

Table:1 Distribution of anthropometric parameters of Non-alcoholic fatty liver diseases patients

Anthropometric parameters	Mean ± SD	Minimum	Maximum
Height in cms	160.92 ± 6.12	150	178
Weight in kg	73.72 ± 9.29	53	92
BMI in kg/m <sup>2</sup>	28.96 ± 3.77	22.0	36.0

Table shows the distribution of anthropometric parameters of Non-alcoholic fatty liver diseases patients. The mean height, weight and BMI was

160.92 ± 6.12 cms, 73.72 ± 9.29 kg and 28.96 ± 3.77 kg/m<sup>2</sup> respectively

Table : 2 Percentage Prevalence of Diabetes, Hypertension, Dyslipidemia and Obesity

SN	Factor	No. of cases	Percentage
1.	Diabetes	41	63.1
2.	Dyslipidemia	30	46.2
3.	Obesity	34	52.3
4.	Hypertension	37	56.9

Diabetes was the most common finding (n=41; 63.1%) followed by hypertension (n=37; 56.9%), obesity

(n=34; 52.3%) and dyslipidemia (n=30; 46.2%) respectively.

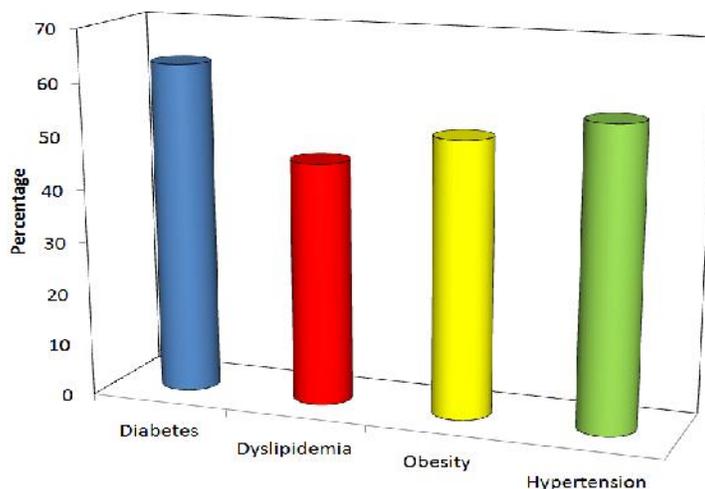
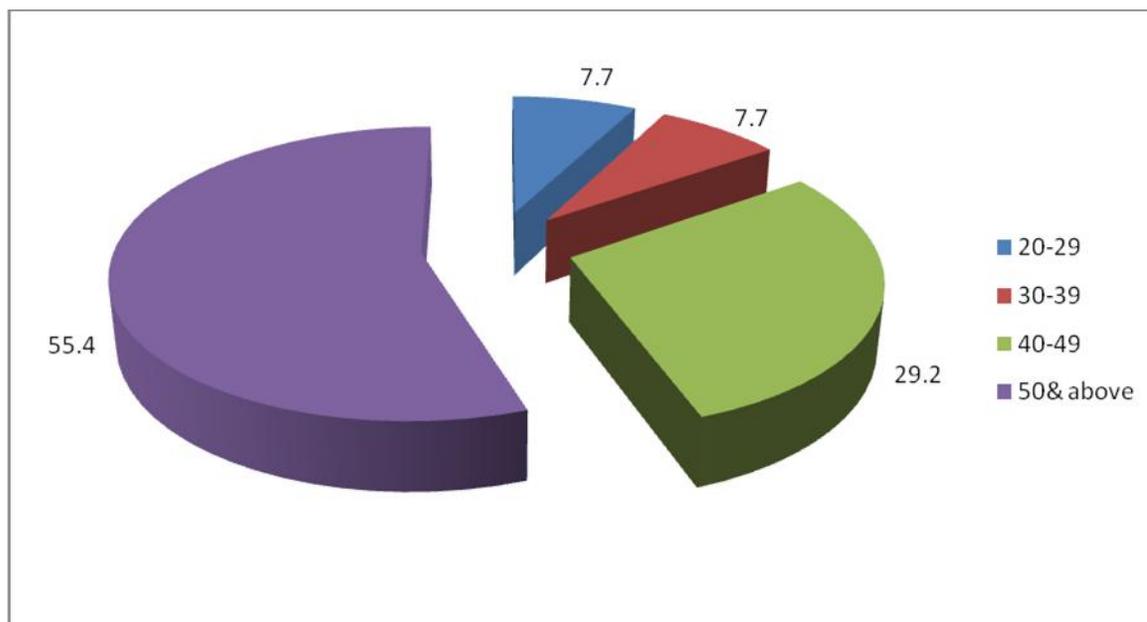


Fig.2 Percentage Prevalence of Diabetes, Hypertension, Dyslipidemia and Obesity

**Table-2a: Age wise breakup of patients of Non-alcoholic fatty liver diseases**

Age group	Frequency	Percent
20-29	5	7.7
30-39	5	7.7
40-49	19	29.2
50 and above	36	55.4



**Figure 3: Age wise breakup of patients of Non-alcoholic fatty liver diseases**

## Discussion

In the present study, prevalence of NAFLD amongst males was found to be 60% and female came out to be 40% (Table no 1a). In a study done by **Mohan V et al (2009)**<sup>7</sup> prevalence of NAFLD amongst male was found to be 33.5% and that amongst female was found to be 29.1% which is much lower than in present study. In a study done by **Amindo Majumdar et al. (2016)**<sup>8</sup> prevalence rate of NAFLD in males was 33% in males and 30% in females. So in present study there is high incidence of NAFLD in males.

In present study, the prevalence of NAFLD increased with increasing age, prevalence of NAFLD in different age groups are as follows; 20-29 years (7.7%), 30-39 years (7.7%), 40-49 (29.2%), 50 and above (55.4%), (Table no. 2a). In study done by **Sanjay Kalra et al. (2013)**<sup>9</sup> prevalence rate among females in age group 20-29 increased from 3% to 20% in the age group 50 & above similarly prevalence rate among male also increased from 4.6% in age group 20-29 to 35.3%. Their findings are similar to present study.. In study done by **P. Paschos and K. Paletas (2009)**<sup>10</sup> the

prevalence of obesity in non alcoholic fatty liver disease found to be 75% which was higher than our study.

In present study, prevalence rate of obesity was more among female NAFLD patients (76.4%) as compared to males (35.9%) which is similar to the study done by **Rushadpatel (2014)**<sup>11</sup>.

In present study, Prevalence of hypertension amongst patient of NAFLD was found to be 56.9% which was lower than the prevalence of rate of 67.9% in study done by **Spyros Michopoulos et al. (2016)**<sup>12</sup>.

In present study, prevalence of hypertension in male patients of NAFLD was found to be 59% whereas in female patients prevalence was found to be 53.5% whereas in study done by **Spyros Michopoulos et al (20014)**<sup>12</sup> females with NAFLD had a higher prevalence of hypertension.

In present study, prevalence of dyslipidemia among NAFLD patients found to be 46.2%, which was lower than the prevalence rate of 52% as found in the study done by **M. V. Jali et al.( 2015)**<sup>13</sup>.

## Conclusion

This study was carried out with an aim to study the prevalence of diabetes, hypertension, dyslipidemia, and obesity in patients of Non alcoholic fatty liver in and around Lucknow. In total 65 patients were taken for the study.

Following conclusion were made at the end of study:

1. In present study, 60% were male non-alcoholic fatty liver disease patients and 40% were female non-alcoholic fatty liver disease patients. Thus present study shows that non-alcoholic fatty liver disease is more common in males.
2. In present study, majority of non-alcoholic fatty liver disease patients were in 50 and above age group.
3. In the present study, diabetes was the most common finding (n=41; 63.1%) followed by hypertension (n=37; 56.9%), obesity (n=34; 52.3%) and dyslipidemia (n=30; 46.2%) respectively.
4. In the present study on comparing the SBP & DBP values of patients of NAFLD-diabetes sub group were significantly higher as compared to those of patients without diabetes (p<.05), which indicates that diabetics are more prone to develop hypertension and also leads into non alcoholic fatty liver disease.

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