Association of Anthropometric Measurement with Ultrasound-Diagnosed Non Alcoholic Fatty Liver Disease in Tertiary Care Hospital

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Background

- Nonalcoholic fatty liver disease (NAFLD) is an increasingly recognized cause of liver disease worldwide

- The present study was conducted with the aim to determine the association of anthropometric measurement with NAFLD among the adult population

Rationale of the study

- The high prevalence and chronic nature of NAFLD has a significant health burden for the general community

- Four anthropometric measurements are simple to measure and can be applied as important indicator to screen population with high risk of NAFLD

Rationale of the study

- Though liver biopsy is a gold standard for diagnosis of NAFLD, it is invasive and has sampling error and bias between observers which limit it's wide application
- Doppler USG is used for the noninvasive diagnosis of NAFLD, and still has limitations due to the low consistence with pathological findings
- So, it is imperative to develop simple and sensitive indicators for the diagnosis of NAFLD

Objectives

- **General Objective**

To evaluate the anthropometric indicators that can effectively predict the nonalcoholic fatty liver disease (NAFLD)

- **Specific Objectives**

  - ✓ Correlation of BMI with NAFLD
  - ✓Correlation of waist circumference (WC) with NAFLD
  - ✓ Correlation of waist hip ratio (WHR) with NAFLD
  - ✓Correlation of waist height ratio (WHtR) with NAFLD

Operational Definition

- ✓ There is evidence of hepatic steatosis, either by imaging or by histology
- ✓ There are no causes for secondary hepatic fat accumulation, such as significant alcohol consumption, use of steatogenic medication or hereditary disorders

Operational Definition

The presence of hepatic steatosis was recognized-

- Marked increase in echogenicity
- poor penetration of the posterior segment of the right lobe of the liver and poor or no visualization of the hepatic vessels and diaphragm
- No inflammation

Materials and Method

- **Study Design:**

  observational, descriptive, cross sectional study
- **Study Period:**

  September, 2013 to March, 2014
- **Study Place:**

  Dept. of Medicine, Gastroenterology and Hepatology Dhaka Medical College Hospital, Dhaka.

Materials and Method

Inclusion criteria:

- Patient attending outpatient department of Hepatology, Gastroenterology and Medicine of DMCH with the complaints of dull aching pain in the right hypochondriac region, at or above the age of 18 years and give consent voluntarily to be enrolled in the study

Materials and Method

Exclusion criteria:

- **Patients will be excluded if:-**

  Unwilling to participate in this study

  Coinfection with HBV, HCV

  Consumed alcohol at least 20 gm/day

  Presence of hepatobiliary diseases or malignancy

  Takes medications known to cause hepatic steatosis (such as estrogens, corticosteroids, amiodarone, Na-valproate; at present or within the last 2 years)

Materials and Method

Sample Size:

- ✓240 consecutive patients attending outpatient department of Hepatology, Gastroenterology and Medicine of DMCH who fulfilled the inclusion and exclusion criteria.

- ✓Enrolled patients are referred for ultrasonography of Hepatobiliary system for non alcoholic liver fatty disease (NAFLD) and for further analysis

Materials and Method

Study procedure:

- ✓All subjects underwent anthropometric measurement which included height, weight, waist circumference, waist hip ratio (WHR),waist height ratio (WHtR). Body mass index (BMI) and were calculated using the standard formula.

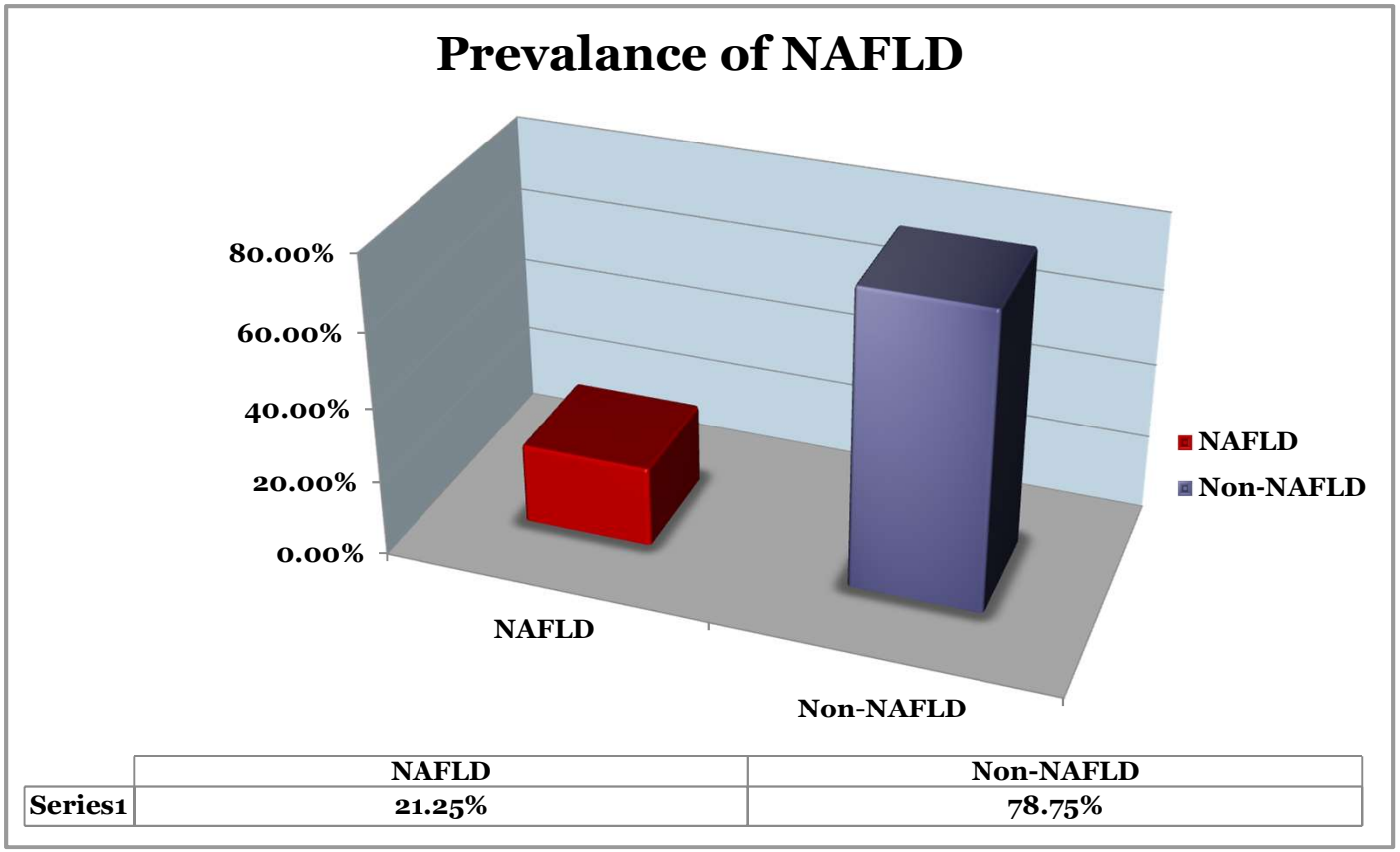
Sampling Technique:

- ✓Purposive

Results

A total of 240 subjects were studied. Among them 51 (21.25%) are USG diagnosed case of NAFLD and 189 are Non NAFLD and out of 51 NAFLD cases 28 (54.90%) are male and 23 (45.10%) are female.

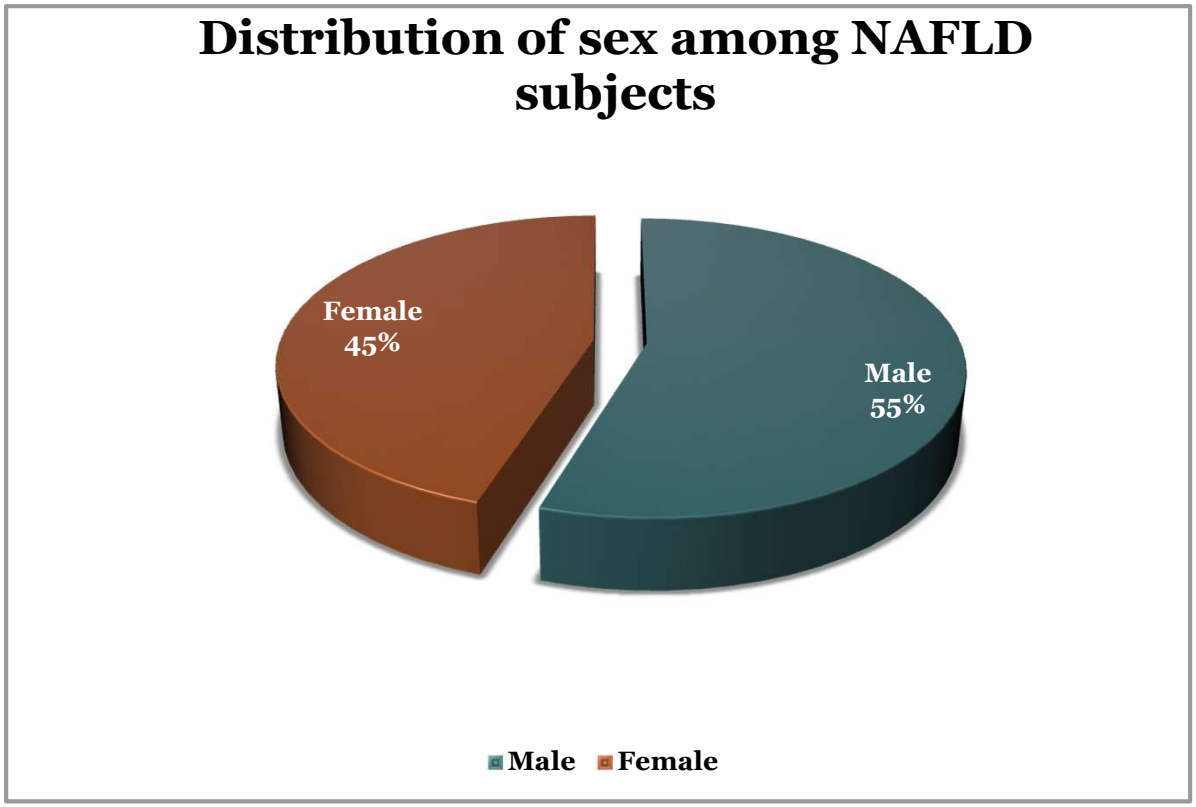
Results



	NAFLD	Non-NAFLD
Series1	21.25%	78.75%

Prevalence of NAFLD is about 21.25% in our society. It is about one fourth of the sample population in comparison with Non NAFLD subjects.

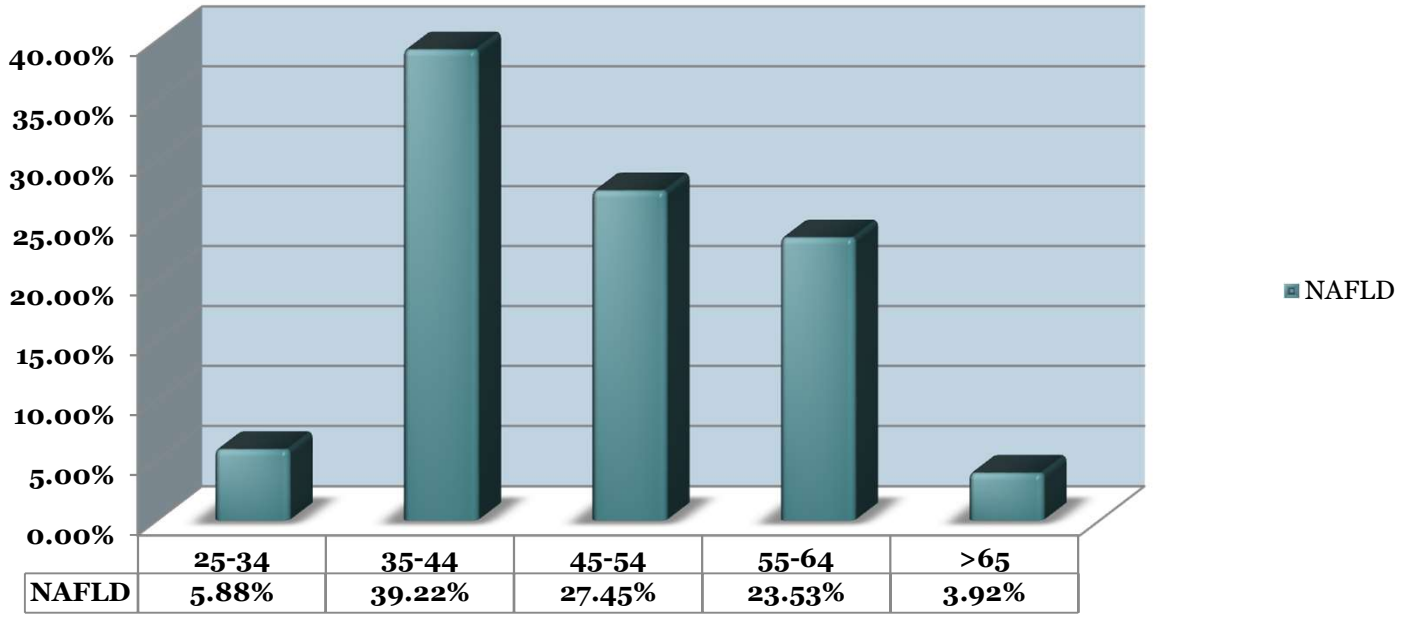
Results



NAFLD is slightly higher in males (54.90%) as compared to females (45.10%) (RR=1.17, 95%CI=1.14-2.58, p=0.008).

Results

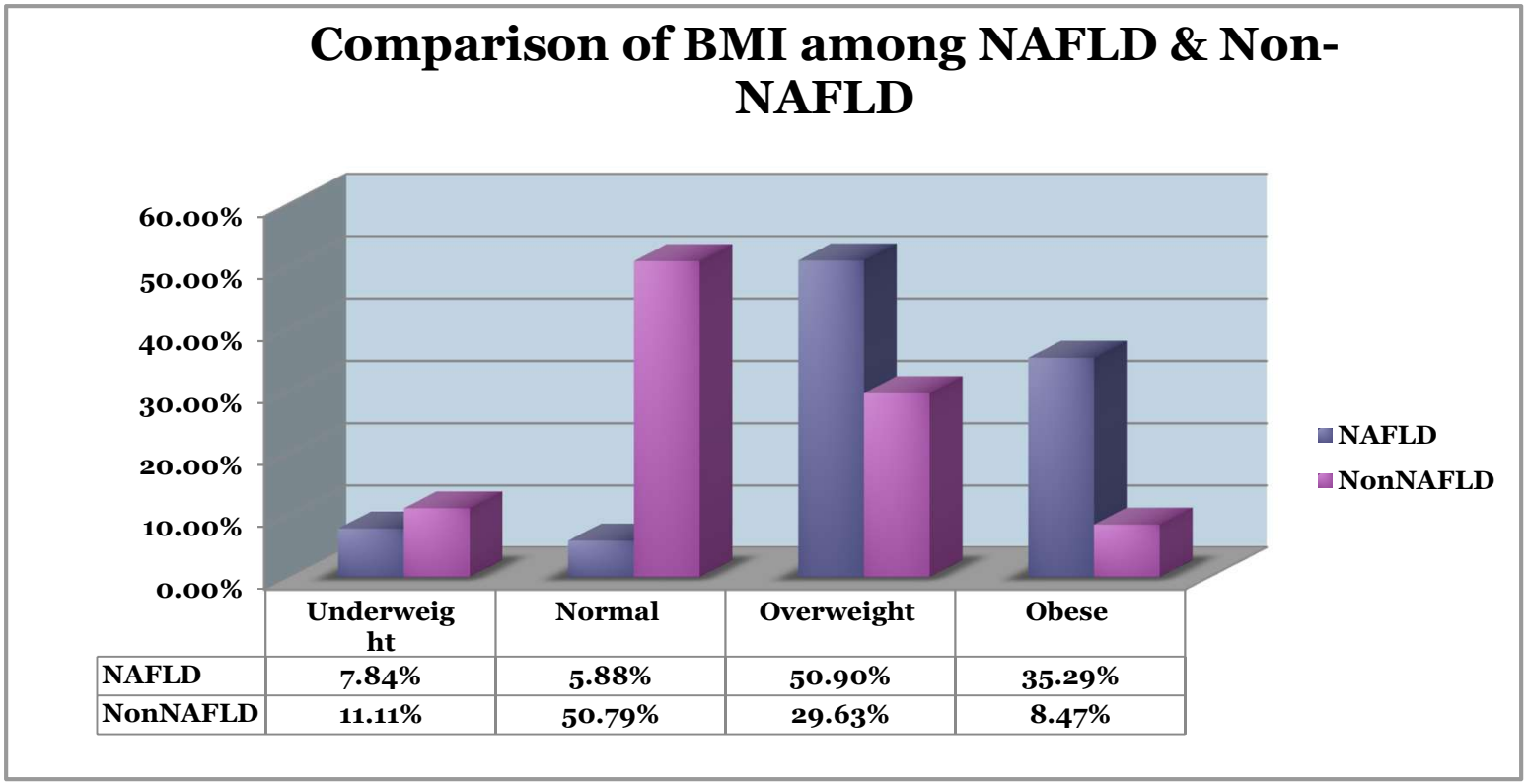
Age distribution among NAFLD



	25-34	35-44	45-54	55-64	>65
NAFLD	5.88%	39.22%	27.45%	23.53%	3.92%

Mean age of study population is 36.30±10 and highest incidence of NAFLD is in age group of 35-44 (39.22%) and then 45-54(27.45%) age group. The least incidence is in age group of >65(3.92%).

Results

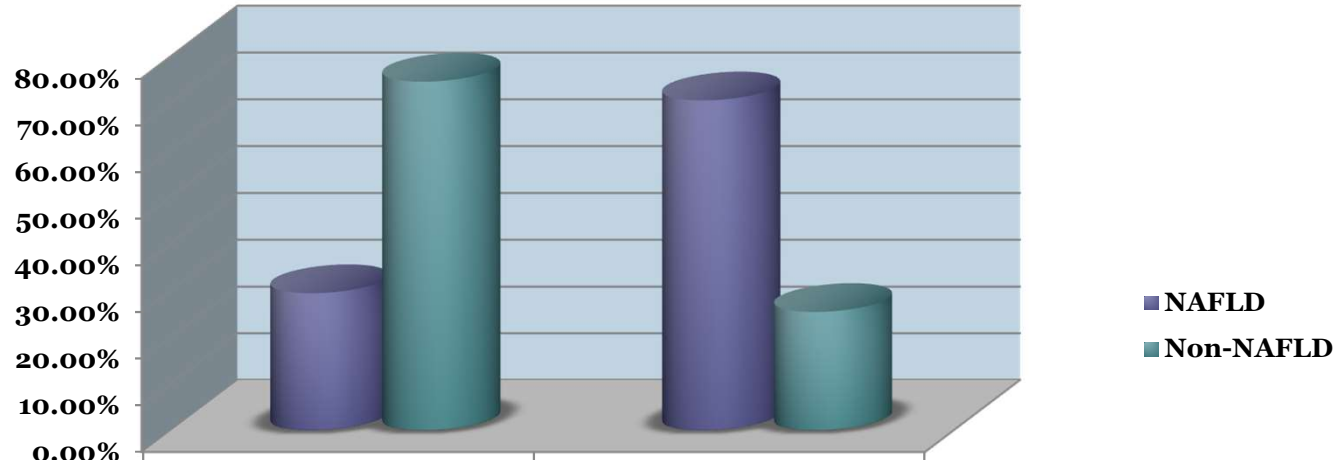


	Underweight	Normal	Overweight	Obese
NAFLD	7.84%	5.88%	50.90%	35.29%
NonNAFLD	11.11%	50.79%	29.63%	8.47%

NAFLD is higher in increased BMI Group especially in overweight which is about 50.99% and then in obese patient which is about 35.29%.It reveals that BMI has strong association with NAFLD which may used as a screening tool

Results

Comparison of waist circumference among NAFLD and Non NAFLD subjects

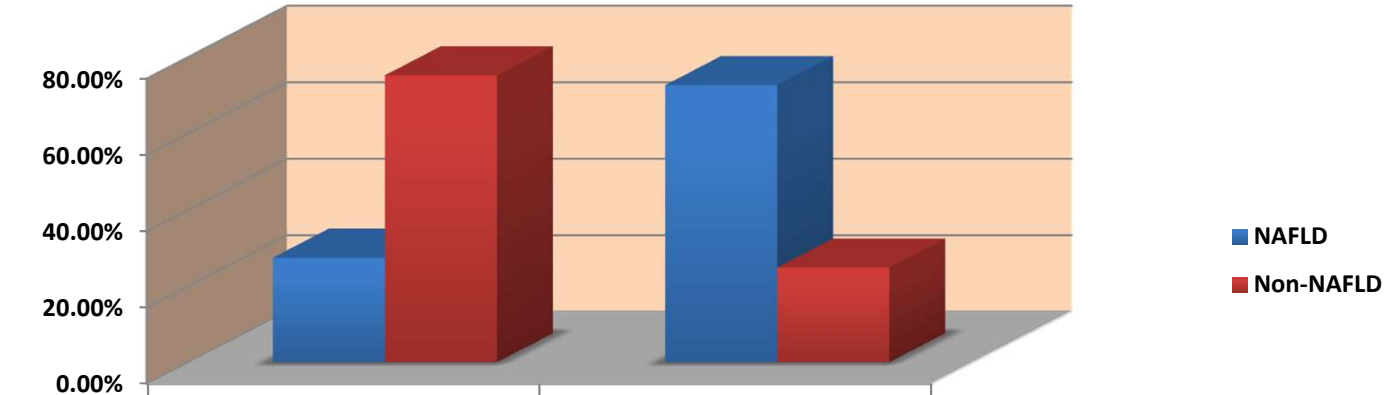


	Normal	High
NAFLD	29.41%	70.59%
Non-NAFLD	74.60%	25.40%

NAFLD has strong association with increased waist circumference, which is about 70.59% and should be used as a easy screening tool for diagnosis of NAFLD in a low resource country

Results

Comparison of waist hip ratio among NAFLD and Non NAFLD subjects

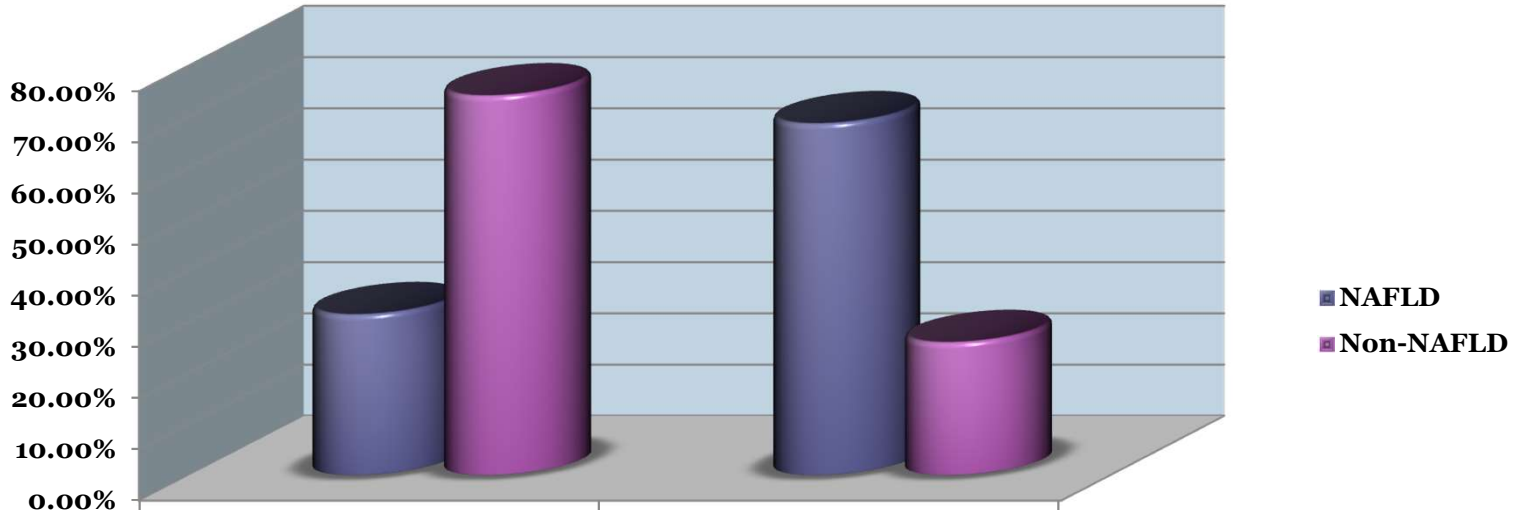


	Normal	High
NAFLD	27.45%	72.55%
Non-NAFLD	75.13%	24.87%

- **Waist hip ratio (WHR) has strong correlation with NAFLD .It is about 72.55% and in comparison with Non NAFLD Group which is about 24.87%, is very high**

Results

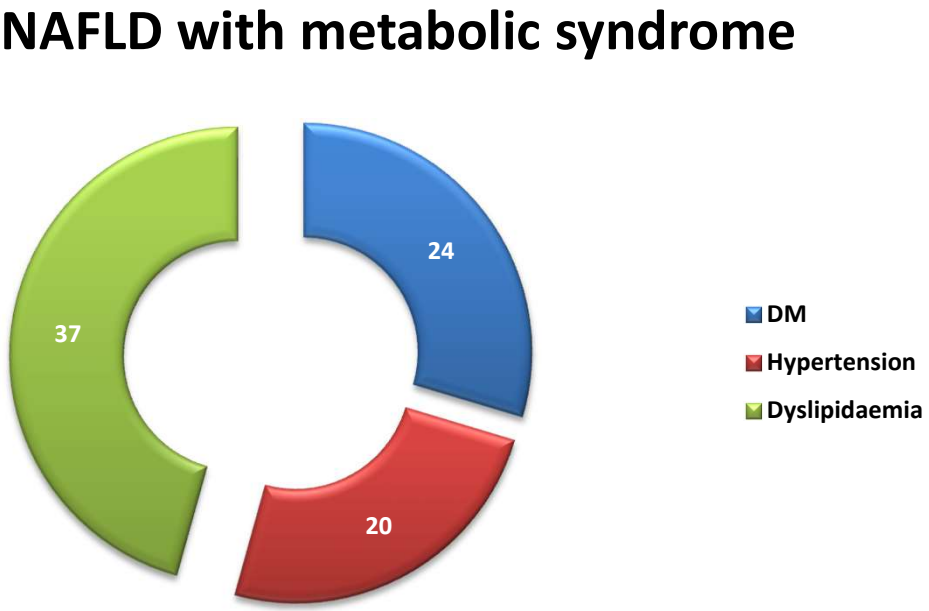
Comparison of waist height ratio among NAFLD and Non NAFLD subjects



	Normal	High
NAFLD	31.37%	68.63%
Non-NAFLD	74.07%	25.93%

Waist height ratio (WHtR) is significantly higher in NAFLD patient than Non NAFLD patient

Results



- **NAFLD with DM is high, and there is correlation of NAFLD with dyslipidaemia**

Discussion

- In the present study, the proportion of NAFLD was found to be 21.25%. This is in accordance with the study carried out by Mohan *et al*. (2009) in Chennai, India who showed almost similar observation i.e. 24.5% and 32.0 % respectively

- Subjects with NAFLD had a higher BMI (26.29±4.41) than those without (21.48±2.60), which is in accordance with a study conducted in costal regions of India which showed that the persons with NAFLD had a higher BMI (mean 25.9±4.2) than those without (mean 22.1±3.3)NAFLD

Discussion

- In the present study, the multivariate logistic regression analysis showed that sex (adjusted OR=11.30, 95% Cl=3.44-37.11, p=<0.0001), waist circumference (adjusted OR= 1.27; 95% Cl= 1.39-1.56, p=<0.0001) and hip circumference (adjusted OR=0.90, 95% CI=0.82-0.99, p=0.0001) were significantly associated with NAFLD

Limitation of the study

- Small sample size
- Liver biopsy was not done
- No imaging study can identify fat accurately if it is < 33% or distinguish NASH from ASH

Recommendations

- Multicenter study with large sample may be done in future to have a consolidated result

- When evaluating a patient with suspected NAFLD, it is essential to exclude competing etiologies for steatosis and co-existing common chronic liver disease

Conclusion

The anthropometric measurements that suggested are simple, non invasive and reliable. However, continued large scale studies are necessary to determine their validity on the prediction of NAFLD.

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THANK YOU