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"CROSS- SECTIONAL STUDY OF NON ALCOHOLIC FATTY LIVER DISEASE AND IT'S ASSOCIATION WITH CENTRAL OBESITY, DYSLIPIDEMIA AND IMPAIRED GLUCOSE TOLERANCE."

Medicine

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ABSTRACT

Introduction- Non alcoholic fatty liver disease (NAFLD) is defined as accumulation of fat in liver, mainly triglyceride in absence of other possible etiologies, such as viral hepatitis, significant alcohol intake, autoimmune hepatitis or hepatotoxic drugs. Nonalcoholic fatty liver disease (NAFLD) has become the most common chronic liver disease in modern societies, affecting as many as 20% to 30% of general population worldwide [1]. Components of metabolic syndrome i.e central obesity, hyperglycemia, dyslipidemia, hypertension are major risk factors for NAFLD. The purpose of the present study is to find an association of NAFLD with dyslipidemia, central obesity and impaired glucose tolerance, so that the patients can be timely managed and further risk of cardiovascular complications can be reduced. **Aims And Objectives-** The aim of this study is to determine the prevalence of undetected central obesity, dyslipidemia and glucose intolerance in NAFLD patients. **Material And Methods-** In 100 non alcoholic subjects with USG diagnosis of fatty liver, fasting blood sugar, postprandial blood sugar and HbA1C levels, fasting lipid profile were analysed. Waist circumference was measured and BMI calculated. **Result-** Prevalence of dyslipidemia in NAFLD was 46%, prevalence of impaired glucose tolerance and diabetes was 36% and 3% respectively and prevalence of central obesity was 83%. There was a positive correlation between FBS and BMI tested by pearson's correlation test that was statistically significant as P value was 0.046. **Conclusion-** In our study it is found that prevalence of dyslipidemia, prediabetes and central obesity is significantly higher in NAFLD cases, also there is a statistically significant correlation between FBS and central obesity.

KEYWORDS

INTRODUCTION

Non alcoholic liver disease (NAFLD) is defined as accumulation of fat in liver, mainly triglyceride in absence of other etiologies like viral hepatitis, autoimmune hepatitis or hepatotoxic drugs and without significant intake of alcohol (i.e < 20 g/day in females and < 30 g/day in males). Nonalcoholic fatty liver disease (NAFLD) has become the most common chronic liver disease in modern societies.

NAFLD has become increasingly common in parallel with the increasing prevalence of obesity and other components of the metabolic syndrome[2,3] and it is projected to be the leading indication for liver transplant within a decade[4]. Non alcoholic fatty liver disease (NAFLD) is estimated to affect approximately 1 billion individuals worldwide. About 2%-5% of adults and upto 20% of those who are obese can develop NASH. In India prevalence of NAFLD is around 9% to 32% with a higher prevalence in those with overweight or obesity and those with diabetes or prediabetes[4]

Spectrum of NAFLD ranges from mild liver fat accumulation to severe necroinflammation, with or without fibrosis (nonalcoholic steatohepatitis; NASH). Long-term complications include cirrhosis and hepatocellular carcinoma.

NAFLD patients frequently have dyslipidemia along with other features of metabolic syndrome such as obesity, diabetes mellitus and hypertension. Dyslipidemia in NAFLD is characterized by raised serum triglyceride, cholesterol, LDL and low serum HDL and is atherogenic. Also, Insulin resistance is recognised as an important factor in pathogenesis of NAFLD and worsens with disease progression. Both dyslipidemia and insulin resistance are risk factors for cardiovascular disease, and there are equivocal evidences that cardiovascular disease is the most common cause of mortality in NAFLD.

MATERIAL AND METHOD

A cross- sectional study was conducted in the Department of General Medicine, G. R. Medical College, Gwalior (M.P.)

Sample Size- 100

Inclusion Criteria

Non alcoholic patients with USG finding suggestive of fatty liver.

Exclusion Criteria

- Patients with significant alcohol intake (i.e. >30gm/day in males, >20gm/day in females).
- HBsAg/HCV hepatitis
- Any chronic illness like CAD, Diabetes mellitus type 1 or 2 , Chronic renal diseases
- Endocrinopathies

METHOD

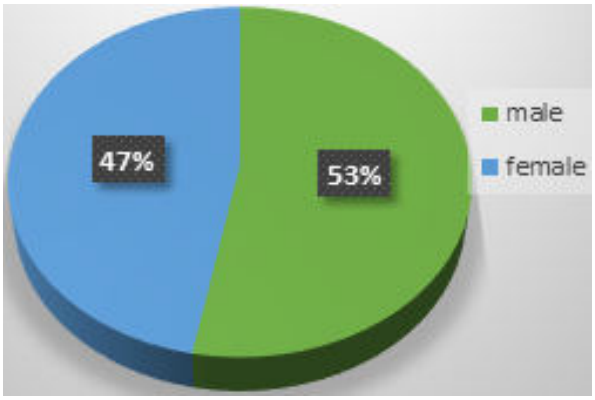
- OPD/IPD non alcoholic patients in age group 15-60 years with USG suggestive of fatty liver were further investigated.
- They have their height, weight, body mass index (BMI), waist circumference, liver function tests, fasting blood sugar and postprandial blood sugar (FBS and PPBS), serology, fasting lipid profile done routinely as part of their periodic health assessment.
- Weight and height of cases were measured and BMI was calculated. The WC was measured using a non-stretchable fibre measuring tape at the point midway between the costal margins and the iliac crests at full expiration. Abdominal WC (for considering obesity) is (Asians) for men >90 cm and females >80 cm. Person is considered obese if his BMI >25(Asian guidelines).

Statistical Method

Statistical analysis was done using SPSS 2.0 software and graphs were generated by Microsoft Excel and Word. A P-value of less than 0.05 was considered significant.

RESULT

- In present study it was found that prevalence of NAFLD in males was higher i.e. 53% as compared to females that was 47% (graph 1).
- 83 cases were obese, 14 were overweight and 3 cases had normal BMI as per WHO standards for Asian population. Obesity was more prevalent in males 54% than in females 29% (table 1).
- Prevalence of dyslipidemia in NAFLD was 46%. 30% of the study subjects had raised S.triglyceride levels while 16% had raised S.cholesterol level and 16% had raised S.cholesterol and triglyceride both(table 2).
- 38% cases had impaired FBS, 16% cases had impaired post prandial blood glucose and 12 % cases had impaired HbA1c level. Showing that FBS level is affected more as compared to HbA1C and post prandial blood glucose level (table-3 and graph 2.1, 2.2 & 2.3).
- There was a positive correlation between FBS and BMI tested by pearson's correlation test that was statistically significant as P value is 0.046 (table-4).



Graph No. 1 Distribution Of NAFLD According To Gender.

Table No.1 Distribution Of Cases According To BMI.

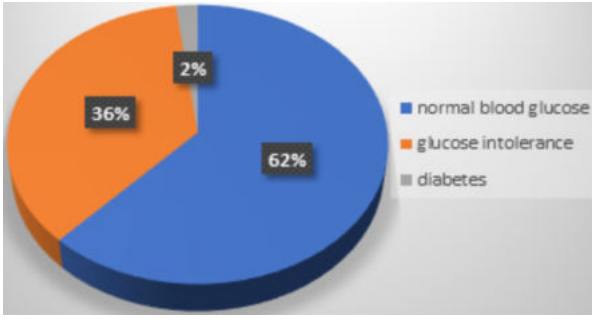
BMI	MALE (no.)	PERCENTAGE	FEMALE (no.)	PERCENTAGE	TOTAL (%)
Normal (17.5-22.9)	1	1%	2	2%	3%
Over weight (23-27.9)	7	7%	7	7%	14%
Obese (>28)	54	54%	29	29%	83%
					100%

Table No. 2 Distribution Of Cases According To Lipid Profile

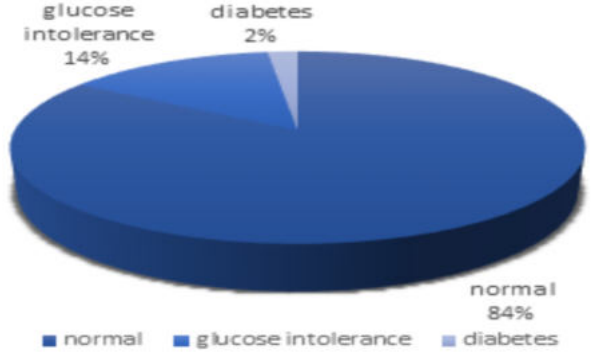
Lipid Profile	No. Of Cases (N=100)	Percentage
normal	54	54%
S.Cholesterol level>200mg/dl	16	16%
S.TG >150mg/dl	30	30%
RAISED TG AND CHOLESTEROL	16	16%
TOTAL	100	100%

Table No.3 Distribution Of Cases According To Blood Glucose Level

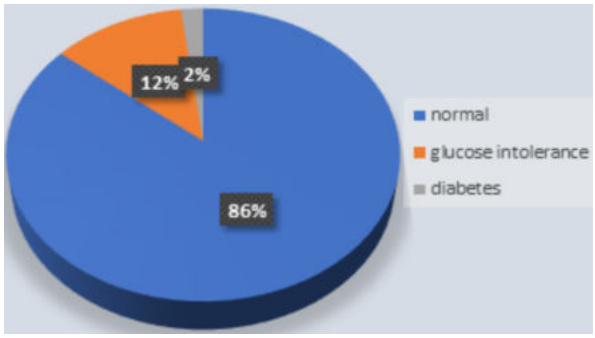
Blood Glucose Level	No. Of Cases (N=100)	Percentage
NORMAL	61	61%
IMPAIRED	36	36%
DIABETES	03	3%
TOTAL	100	100%



Graph No. 2.1 Distribution Of Cases According To FBS Level



Graph No.2.2 Distribution Of Cases According To Post Prandial Blood Glucose Level



Graph No. 2.3 Distribution Of Cases According To HbA1C Level

Table No.4 Correlation Between FBS And BMI

BMI status	Normal FBS	Impaired FBS	Pearson's correlation coefficient	P value
Normal	06	05	0.20	0.046
Overweight/ Obese	57	32		

DISCUSSION

After observation of data and results following discussion were made-

- In present study, prevalence of NAFLD was more among males (53%) as compared to females (47%). Pan J.J and Fallon M.B et al [5] who studied about gender and racial differences in NAFLD in US population documented the male preponderance in their study.
- In present study 83% cases were obese, 14% cases were overweight, and 3% were of normal BMI while none were underweight. Mean of BMI among study population was 30.3 and SD 3.2, indicating that the prevalence of obesity is more in NAFLD suggesting a bi-directional relation between obesity and NAFLD. This is in line with Suresh, et al,[6] in their study they found that 78% of the NAFLD cases were obese and none was underweight.
- Present study shows that 46% of the study subjects had dyslipidemia . 30% of the study subjects had raised S. triglyceride levels while 16% had raised S.cholesterol level and 16% had raised s.cholesterol and triglyceride both. This suggests that the prevalence of dyslipidemia in NAFLD is 46%. Study by Chatrath et al, [7] showed that dyslipidemia in NAFLD was typically characterized by increased serum TG levels, increased small, dense LDL particles, and decreased HDL cholesterol. Sathiaraj et.al,[8] also documented elevated total cholesterol and triglycerides levels in NAFLD patients.
- In present study 36% cases had impaired FBS, Post prandial, and HbA1C levels and 3% cases had FBS, post prandial glucose and HBa1C levels in diabetic range. Therefore prevalence of glucose intolerance in NAFLD was 36% and prevalence of diabetes was found to be 3%.
- 38% cases had impaired FBS, 16% cases had impaired post prandial blood glucose and 12% cases had impaired HbA1c level. Mathew et al,[9] in a cross-sectional study observed that overall proportion of prediabetes and diabetes in NAFLD subjects was 52.7% and 30.7%, respectively. There was a greater proportion of prediabetics and diabetics in the higher grades of NAFLD ($P < 0.001$). Out of 79 prediabetics, isolated IFG were seen in 63.2% participants, 34.1% participants had both IFG and IGT and only IGT was observed in 2.5% participants. It was observed that mean FPG, PPG and HbA1c increased with increased severity of NAFLD.

CONCLUSION

In the present cross-sectional study it was observed that-

- Prevalence of NAFLD was more among males than females.
- It was found that NAFLD was significantly associated with central obesity, dyslipidemia and glucose intolerance.
- BMI and waist circumference both are a positive predictor of glucose intolerance in NAFLD but in our study, BMI was found to be strong predictor of glucose intolerance as well as dyslipidemia when compared to waist circumference.

As found in current study there is a high prevalence of central obesity, dyslipidemia and prediabetes in NAFLD cases, that themselves are major risk factors for various microvascular and macrovascular

complications therefore, NAFLD cases need to be timely investigated for presence of prediabetes, diabetes and dyslipidemia.

REFERENCES

1. Anstee,Q.M.,Reeves, H.L.,E.et al. From NASH to HCC: current concepts and future challenges. Nat Rev Gastroenterol Hepatol16, 411-428(2019).https://doi.org/10.1038/s41575-019-0145-7
2. Rinella ME. Nonalcoholic fatty liver disease: a systematic review. JAMA. 2015;313:2263–73. doi: 10.1001/jama.2015.5370. [PubMed] [CrossRef] [Google Scholar]
3. Brunt EM, Wong VW, Nobili V, Day CP, Sookoian S, Maher JJ, Bugianesi E, Sirlin CB, Neuschwander-Tetri BA, Rinella ME. Nonalcoholic fatty liver disease. Nat Rev Dis Primers. 2015;1:15080. doi: 10.1038/nrdp.2015.80. [PubMed] [CrossRef] [Google Scholar]
4. Duseja A. Nonalcoholic fatty liver disease in india -a lot done , yet more required !Indian J Gastroenterol.2010 Nov;29(6):217-25
5. Pan JJ, Fallon MB. Gender and racial differences in nonalcoholic fatty liver disease. World journal of hepatology. 2014 May 27;6(5):274.
6. Suresh S, Rajanbabu B, Veetil VM, Hussain A, Veetil JN. A study on the altered glycemic and lipid parameters and prevalence of insulin resistance in nonalcoholic fatty liver disease. J Family Med Prim Care 2018;7:93-7.
7. Chatrath H, Vuppalanchi R, Chalasani N. Dyslipidemia in patients with nonalcoholic fatty liver disease. Semin Liver Dis 2012;32:22 9
8. Sathiaraj E, Chutke M, Reddy MY, Pratap N, Rao PN, Reddy DN, Raghunath M. A casecontrol study on nutritional risk factors in non-alcoholic fatty liver disease in Indian population. European journal of clinical nutrition. 2011 Apr;65(4):533.
9. Mathew T, Vidyasagar S, Varma MD,Nandakrishna B, Holla AM, Binu VS. Glucose intolerance and insulin resistance in non-alcoholic fatty liver disease: A Hospital-based Cross-sectional study from southern Karnataka, India. J Diabetol 2017;8:68-73.