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"A STUDY ON PREVALENCE OF NON ALCOHOLIC FATTY LIVERDISEASE IN DIABETICS AND ASSOCIATION BETWEEN LIPID PROFILE AND CENTRAL OBESITY IN NAFLD"

General Medicine

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ABSTRACT

Background: The incidence of diabetes in India is 3.8%. It is well known that diabetes is a systemic disease, it affects almost all organ systems.Non-alcoholic fattyliver disease (NAFLD) is being increasingly recognized today as apotentially serious complication of diabetes, especially type 2. The spectrumof NAFLD extends from simple steatosis or steatosis with mildinflammation to severe non-alcoholic steatohepatitis (NASH).Thepathophysiology and treatment remain unclear in many respects, but much progress has been made since the introduction of the terms non-alcoholic steatohepatitis (NASH) in 1980 and non-alcoholic fatty liver disease (NAFLD) in 1986.

Aim & objectives :

1) The aim was to analyse the prevalence of fatty liver (non alcoholic fatty liver disease) in patients with diabetes.
2) To know the association between lipid profile and presence of NAFLD.
3) To know the relationship between central obesity and NAFLD.

Materials And Methods : A total of 75 diabetics(both type 1 and type 2) were studied in the out patient and inpatient department of medicine in Alluri sitaramaraju academy of medical sciences, a tertiary care center of southindia from 1st September 2020 to 30thAugust 2021. The study group consisted of about 15 males and 60 females, between the age groups of 19 – 73 yrs, the average age being 51.88 yrs. The durationof diabetes in these patients ranged between 0 to 20 yrs, with the averageduration being 5.17 yrs.

Results:

1) Among the 75 diabetics who were studied, fatty liver was found in 31patients (41.33%).
2) The number of males with fatty liver were 2 (2.6%) and females 29(38.6%).
3) The number of patients with fatty liver who had central obesity (waist hipratio >1) – 23 (74.19%).
4) All the patients with fatty liver had central obesity (waist hip ratio >1 in males and >0.85 in females).
5) The number of patients who had increased triglycerides >180 amongpatients with fatty liver 28 (90.3%).
6) No. of patients who were overweight among the persons detected to have fatty liver – 21 (67.74%).
7) No. of patients with normal BMI among the persons with fatty liver – 10 (32.2%).
8) No. of patients with increased cholesterol (>200 mg%) among patients withfatty liver – 20 (64.5%).

KEYWORDS

NASH, NAFLD, Fatty Liver,Steato Hepatitis, Diabetes, Hyperlipidemia, BMI, Waist Hip Ratio.

INTRODUCTION:

The incidence of diabetes in India is 3.8%. It is well known that diabetes is a systemic disease, it affects almost all organ systems.Non-alcoholic fatty liver disease (NAFLD) is being increasingly recognized today as a potentially serious complication of diabetes, especially type 2.

The spectrum of NAFLD extends from simple steatosis or steatosis with mild inflammation to severe non-alcoholic steatohepatitis (NASH).Excess glycogen accumulation in the liver is seen in 80% of diabetic patients. Glycogen synthesis in the liver is impaired in diabetes due todefective activation in glycogen synthase.

In patients with chronic diabetes, glycogen accumulation is seen and is postulated that long standing insulin deficiency may actually facilitate synthase activity. This and enhanced gluconeogenesis may account for the net accumulation of glycogen in diabetes.There was no alteration in the serum protein or albumin globulin ratio.

Patients showing solely excessive glycogen deposition may exhibit hepatomegaly and liver enzyme abnormalities and may have abdominal pain and vomiting and rarely ascites. All these abnormalities may improve with sustained glucose control.

NAFLD Indicates the presence of fatty infilteration of the liver defined as exceeding 5% weight and frequently taken as fat in >5% of hepatocytes. NASH is one of the most common of all liver diseases.

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.Insulin resistance is common in NASH patients and hyperinsulinemia mayplay a pathogenic role in the progression of NASH, even in the absence of overt diabetes.

It is estimated that as many as 75% of patients with type 2DM have fatty infilteration. Fatty infilteration also has been found to precede the development of overt diabetes. The progression to more overt diabetes in these patients may depend on additional factors such as peripheral fat metabolism, pancreatic islet cell vitality and the stage of liver fibrosis.

The severity of liver injury worsens with the degree of abnormal glucose metabolism in obese patients. NAFLD and NASH have been described in patients without the classic riskfactors of obesity, diabetes and overt hyperlipidemia. This group appears to contain relatively younger men with milder histologic changes and with visceral or central adiposity and hyperinsulinemia.

Patients with simple steatosis probably need only observation with regard to liver disease, although associated conditions may warrant consideration of probable toxicity of common agents, such as, anti lipidemics, anti hypertensives, and anti diabetic medications.

For patients with mild inflammation and no fibrosis, a less aggressive observational approach is required because the prognosis appears to be relatively good. A more directed therapy is required if fibrosis is present at biopsy.

Insulin resistance appears to be crucial in most patients with NASH, therefore therapy aimed at hyperinsulinemia, insulin resistance or overt diabetes seems reasonable.

Thiazolidinediones are ligands of PPAR γ that promote adipocyte differentiation. Use of these agents is associated with increased bodyweight but decreased central adiposity, increased glucose transport and increased mitochondrial mass. Another diabetic agent that warrants consideration is, metformin (a biguanide agent), which decreases steatosis and improves histological findings in NASH.

MATERIALS AND METHODS:

A total of 75 diabetics(both type 1 and type 2) were studied in the out patient and inpatient department of medicine in Alluri sitaramaraju academy of medical sciences, a tertiary care center of southindia from 1st September 2020 to 30thAugust2021. The study group consisted of about 15 males and 60 females, between the age groups of 19 – 73 yrs, the average age being 51.88 yrs. The durationof diabetes in these patients ranged between 0 to 20 yrs, with the averageduration being 5.17 yrs.

Inclusion Criteria :

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

Exclusion Criteria :

1. Consumption of alcohol
2. Seropositivity to HIV ELISA
3. Seropositivity of anti HCV antibody
4. Patients on drugs that are proven to cause steatohepatitis (steroids, amiodarone, oral contraceptive pills and other estrogen containing preparations).

All the above patients were screened for HIV and HCV and were negative for both.

The following investigations were done on these patients:

- Liver function test Lipid profile Ultrasound abdomen Random blood sugar .

The patient's weight and height were measured and BMI calculated. ABMI >25 was considered overweight.Waist hip ratio was also measured to look for central obesity.If the ultrasound showed evidence of fatty liver, with or without theelevation of transaminases, a presumptive diagnosis of NAFLD was made.

RESULTS:

A total of 75 diabetics(both type 1 and type 2) were studied during this period. Both inpatients and outpatients were included in the study. The study group consisted of about 15 males and 60 females, between the age groups of 19 – 73 yrs, the average age being 51.88 yrs. The duration of diabetes in these patients ranged between 0 to 20 yrs, with the average duration being 5.17 yrs.

1) Among the 75 diabetics who were studied, fatty liver was found in 31patients (41.33%).
2) The number of males with fatty liver were 2 (2.6%) and females 29(38.6%).
3) The number of patients with fatty liver who had central obesity (waist hipratio >1) – 23 (74.19%).
4) All the patients with fatty liver had central obesity (waist hip ratio >1 in males and >0.85 in females).
5) The number of patients who had increased triglycerides >180 amongpatients with fatty liver 28 (90.3%).
6) No. of patients who were overweight among the persons detected to have fatty liver – 21 (67.74%).
7) No. of patients with normal BMI among the persons with fatty liver – 10 (32.2%). No. of patients with increased cholesterol (>200 mg%) among patients withfatty liver – 20 (64.5%).

All the patients with ultrasound evidence of fatty liver showed, marginallyelevated transaminases and occasionally of serum alkaline phosphatase. There was no alteration in the serum protein or albumin globulin ratio.

Table 1: Prevalence Of Fatty Liver And Sex Distribution

No of patients with fatty liver	31
No of patients without fatty liver	44
No of males with fatty liver	2
No of females with fatty liver	29

Table 2: Patients With Fatty Liver And Central Obesity

Parameters of central Obesity	No of patients
Waist Hip Ratio >1	23
Waist Hip Ratio <1	8
BMI >25	21
BMI<25	10

Table 3: Prevalence Of Dyslipidemia Among Patients With Fatty Liver

No of patients with increased TGL(180)	28
No of patients with normal TGL	03
No of patients with Total Cholesterol (>200)	20
No of patients with Total Cholesterol(<200)	11

DISCUSSION :

The prevalence of fatty liver in this study was found to be 41.3%. According to a study conducted by Daad H. Akbar, the prevalence of NAFLD was found to be 55%.(48)According to another study conducted by Gupta P et al the prevalence of NAFLD, by ultrasound examination, was found to be 49%.

Among the patients with NAFLD the percentage of patients who were overweight was 67.74%. Wanless and Lentz found mild to severe steatosis in approximately 70% of obese patients and 35% of lean patients.(20)Garcia Monzon et al found NASH in 69% whereas 22% had simple steatosis and only 8% had normal biopsy findings.

In another study the presence of NAFLD was highest among obese patients, with BMI of 30 +/- 5.5 kg/m2 .However, in another study there was no significant difference in body mass index among patients with NAFLD.

NASH can exist with only non specific symptoms for years in obese patients before manifesting itself either incidentally or with complications of cirrhosis or portal hypertension. The prevalence of fatty liver was found to be higher among women (38.6%) than men.

Many studies have found the presence of fatty liver to be higher in women.(12,48) NAFLD and NASH have been described in patients without the classic risk factors of obesity, diabetes and overt hyperlipidemia. It has been described in patients with central of visceral adiposity in a study conducted by Bacon BR et al.(47)

In another study, fatty liver was strongly correlated with visceral adipose tissue.(48)In this study the percentage of patients with central obesity among patients with fatty liver was 100% and those with a waist hip ratio of >1 was 74%. The no. of patients with increased triglycerides and cholesterol was found to be 90.3% and 64.5% respectively.

As mentioned earlier two thirds of patients with hypertriglyceridemia and one third of patients with hypercholesterolemia have fatty liver.(26) In another study, among patients with obesity and fatty liver, approximately 20% have some type of previously identified hyperlipidemia (48) In other studies, fatty liver was strongly correlated with the degree of dyslipidemia, especially the level oftriglycerides.

Hypertriglyceridemia was identified as an important risk factor in the development of NAFLD and NASH, it also correlates well with the histological severity of the disease.(46,47,48) In summary, obesity and type 2 diabetes are the best characterized risk factors, with older age and presence of hypertriglyceridemia, are predictors of the severity of underlying histologic changes.

Many lean patients with fatty liver have truncal or central adiposity. The prevalence of NAFLD is more in women than men. Only 10% of consecutively examined obese patients have normal results at liver biopsy. Approximately 5% have cirrhosis and 85% have steatosis. One third of the latter have NASH.

CONCLUSION:

- The prevalence of non-alcoholic fatty liver disease was 41.3% and it was present mainly in patients with type 2 diabetes mellitus.
- It occurred more commonly in women (38.66%) than men.
- The occurrence of non-alcoholic fatty liver was found to be higher in patients who were overweight/ obese and in those with central obesity.
- 90.3% of the patients with fatty liver had dyslipidemias (especially hypertriglyceridemias).

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