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PREVALENCE OF NON-ALCOHOLIC FATTY LIVER DISEASE IN TYPE 2 DIABETES MELLITUS IN JLNMCH HOSPITAL BHAGALPUR

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ABSTRACT **OBJECTIVE** This study was undertaken with an objective to study the prevalence of non alcoholic fatty liver disease in type 2 diabetes in Jlnmch hospital bhagalpur and to know the spectrum of non alcoholic disease in type 2 diabetes mellitus as well as other risk factors . **METHODS** A hospital based cross-sectional descriptive study was conducted in the department of General Medicine at JLNMCH HOSPITAL BHAGALPUR from November 2021 to October 2022 for a period of 1 year. During the period of data collection 950 with Type 2 DM on the basis of American Diabetic Association criteria and among them 150 were included in the study after screening with inclusion and exclusion criteria, they underwent USG whole abdomen ,LFT , lipid profile test and HbA1c were also done. A detailed history and examination was done of these patient. **RESULTS** NAFLD present in 34% of Type 2 DM, prevalence of female and male 49% and 51% respectively. Other risk factors of NAFLD were hypercholestremia (HDL<40 , LDL >100), hypertriglyceridemia (TG >150), obesity and overweight (BMI >28). **CONCLUSION** Prevalence of NAFLD in Diabetics was 34%. So out of 10 diabetic patient 3 are having NAFLD and prevalence in male as well as female is almost same. India being the capital of diabetes mellitus it should be taken serious as progression of disease is slow but overall prognosis is bad. Being a preventable disease at early stage measure should be taken as early as possible

KEYWORDS :

INTRODUCTION

Non alcoholic fatty liver disease (NAFLD) is one of the most common liver diseases since its prevalence is estimated to be 20-30% in general population of western countries. Even in this part of the world the estimated prevalence is 8.7 to 32 %. NAFLD is defined as excessive fat in the liver (> 5% of liver weight or > 5 % of hepatocytes are affected) which is not attributable to excessive alcohol intake. NAFLD includes a spectrum of liver damage ranging from simple steatosis to nonalcoholic steatohepatitis (NASH), advanced fibrosis, and rarely, progression to cirrhosis. Recent studies emphasize the role of insulin resistance, oxidative stress and subsequent lipid peroxidation, proinflammatory cytokines, adipokines and mitochondrial dysfunction in the development and progression of NAFLD.

This review summarizes the current knowledge on the epidemiology, pathophysiology and diagnosis of NAFLD and the findings that strongly support the association of nonalcoholic fatty liver WITH TYPE 2 DIABETES MELLITUS.

Treatment of NAFLD should begin with screening and managing metabolic risk factors that may modify the risk of liver disease as well as non-liver related diseases. First line treatment should consist of lifestyle change with weight loss and exercise to improve insulin sensitivity. However, because of long term compliance difficulties, pharmaceutical agents aimed at reducing insulin resistance or protecting the liver from additional insults may eventually be needed.

NAFLD is an overlooked complication of diabetes mellitus that if missed may carry serious long term complications. Though the prevalence of deranged liver enzymes in diabetes ranges from 7.2% to 22.9 %, the prevalence of NAFLD in these patients largely remains unknown as it is generally asymptomatic and is not picked by routinely done procedures. However there is a clear association between diabetes and non-alcoholic fatty liver disease (NAFLD).

Studies over recent years have shown that NAFLD predicts the development of diabetes and vice versa and that each condition serves as a progression factor for the other.

Although this association is likely to be partly the result of a "common soil," it is also probable that diabetes interacts with NAFLD via specific pathogenic mechanisms. Thus a cross sectional observatory prospective study has been conducted to find out the prevalence and various risk factors associated with NAFLD in Type 2 diabetic patients residing in eastern part of the country

METHEDOLOGY

Cross sectional prospective observational study of diabetic patient in JLNMCH BHAGALPUR hospital was performed.

Study Area:

Department of General Medicine, JLNMCH COLLEGE & HOSPITAL BHAGALPUR.

Study population :

The study population included around 950 known patients of Type2 Diabetes Mellitus attending the OPD during a period of November 2021 to October 2022.

Inclusion Criteria:

- Diagnosed case of type 2 Diabetes Mellitus according to ADA Guidelines 2017.
- Fasting Plasma Glucose (FPG) > 126 mg/dl (7mmol/l), or o 2 Hours Plasma Glucose > 200 mg/dl (11.1mmol/l) during an Oral Glucose Tolerance Test.
- HbA1C > 6.5%. A BMI of>=25kg/m2.
- Whose USG suggest features of Fatty Liver Changes.

Exclusion Criteria:

- Prior history of icterus.
- Patients with history of alcohol consumption of more than 30mg/day for men and more than 20mg/day for women for 10-20 years
- Persons with no previous history of jaundice, viral hepatitis or use of hepato-toxic drugs.
- History of use of drugs causing LFT abnormalities (Hepatotoxic drugs)
- Hepatitis B, Hepatitis C and HIV cases

Plan of Study:
An outline plan for conducting the study is as follows:

- A Cross Sectional prospective observational Study was carried out including sample of 150 patients of Type 2 Diabetes Mellitus.
- The sample population was divided into two independent study groups depending upon USG findings suggestive of Fatty Liver Disease :- 1.Diabetic Patients with NAFLD.

2.Diabetic Patients without NAFLD.
- For all enrolled patients a questionnaire was filled out about age, gender, duration of Diabetes Mellitus, anti-diabetic medications taken, history of alcohol use with its durations and quantity.
- Excess alcohol intake was defined as more than 30 mg/day in case of males and more than 20mg/day for females.
- Anthropometric measurements were taken for their weight, height, BMI, waist circumference, hip circumference and waist hip ratio.

Blood samples were collected after 10 hours fasting. Fasting plasma glucose (FPG), post prandial plasma glucose (PPPG), HbA1c, total bilirubin, direct bilirubin, indirect bilirubin, albumin, globulin, SGOT, SGPT, alkaline phosphate, total cholesterol, triglyceride, high-density lipoprotein cholesterol (HDLC), low density lipoprotein cholesterol (LDLC) and very low density lipoprotein cholesterol (VLDLC) levels were estimated.

- Plasma Glucose FPG and PPPG were calculated by hexokinase (enzymatic UV) method. Enzymatic color test was used to determine HDLC, LDLC, Total Cholesterol and Triglyceride. HbA1c was estimated by affinity chromatography.
- BMI was calculated [The height weight and body mass index was measured according to WHO criteria.90]

The Liver function tests were analyzed by homogenous enzymatic method.
- Ultrasonography was done

Categorical data was expressed as proportions and analyzed using Pearson Chi Square Test. Continuous data was expressed as mean and standard deviation and analyzed using Students T Test. Odds ratio using 95% confidence interval was used to analyze the different risk factors. P value of 0.05 was considered significant

RESULTS
Out of 150 diabetic patients (62 males and 88 females) included in the study 51 have features of fatty liver and 99 have normal liver profile in ultrasonography. The prevalence of NAFLD in our study is (n = 150) – 34% with prevalence in males (n = 62) – 51% and females (n = 88) – 49%. This outcome is very much in agreement as compared to similar studies conducted in various parts of India. IT WAS ALSO ASSOCIATED WITH HIGH BLOOD PRESSURE, HIGH CHOLESTEROL, HIGH TRIGLYCERIDE LEVELS.

DISCUSSION
Non-alcoholic fatty liver disease: an emerging public health problem in Asia The prevalence of NAFLD in Asia has been reported up to 51.5% , and the prevalence of NAFLD is expected to increase in coming decades. A 2.6 fold increase in prevalence of NAFLD was found when it occurred in association with Type 2 diabetes. The prevalence of NAFLD in our study is (n = 150) – 34 %. With prevalence in males (n = 62) – 51 % and that of females is (n = 88) – 49%.

This outcome is very much in agreement as compared to similar studies conducted in various parts of India. Most of the patients with NAFLD are asymptomatic. The disease is discovered either incidentally during routine laboratory examination or when the patient is investigated for conditions like hypertension, diabetes or obesity. In our study group 34.28% patients were asymptomatic. Indian studies have reported 30.8 to 38% patients to be asymptomatic. . In our study 15.71% patients had symptoms of liver disease. Right upper abdominal pain or discomfort (5.71%), fatigue (5.85%) and malaise (4.15%) were the dominant symptoms. The mean age (mean± s.d) of the total study population was 53.99 +/- 9.669 years with range 23-78 years and the median age was 54 years. The mean age (mean± s.d.) of the patients with NAFLD was 54.86 ± 11.89 years with range 23-78 years and that of the patients without NAFLD was 53.64± 8.65 years. Prevalence in males (n = 62) – 51 % and that of females is (n = 88) – 49%. Out of the 86 patients on OHAs only 17 (33.3%) had NAFLD whereas 14 of 29 patients on Insulin had NAFLD (27.5%). Patients on a combination on both had a highest prevalence of the disease 20 of 35 cases (39.2%). This observation is statistically significant. A significant difference in the mean HbA1c level (mean± s.d.) of patients with NAFLD, 7.93 ±1.33 % and that of patients without NALFD was 7.29± 1.217 % (p = <0.001) was found. Similar difference was also found in the Fasting and Post Prandial blood sugar levels also, both with a p value of <0.001.

Difference in the BMI level was also statistically significant between the two groups. The mean albumin (mean± s.d.) of patients with NAFLD was 4.2 +/- 0.63 mg/dl and that of patients without NAFLD was 3.99 +/- 2.65gm/dl. The difference in these two groups was statistically significant (p<0.0001). The mean SGOT (mean± s.d.) of patients with NAFLD was 43.42 +/- 12.06 IU/l and that of patients without NAFLD was 39.76 +/- 10.10 IU/l. The difference in these two groups was statistically significant and so was the difference in SGPT level with a P value of 0.007. Our study also showed a positive correlation of deranged lipid profile with prevalence of NAFLD with a significant association with triglyceride (p <0.01), cholesterol (p= 0.001), HDL (p <0.016) and VLDL (p = 0.01). However our study failed to show a positive correlation between NAFLD and alkaline phosphate (p=0.054). Liver biopsy is the gold standard for diagnosis of NAFLD. But because of its invasiveness, complication, painfulness and sampling error it is not feasible in every asymptomatic cases. Fibroscan is also a good option for finding NAFLD but due to lack of availability in hospital and nearby. In this aspect ultrasonography offers promising role to diagnose NAFLD which is supported by significantly increased lipid profile values in our study.

CONCLUSION
NAFLD is a rapidly growing epidemic and is not confined to the western world but due to the behavioural changes in the Indian population, its prevalence in India is at par with the western prevalence. Due to their dietary habits (high carbohydrate and low fibre content) and predominantly sedentary lifestyle the urban population of eastern part of the country is particularly at risk of developing fatty liver as realized by this study. However, what is much more important and crucial is the salient but high risk of NAFLD patients to develop other metabolic diseases. Like in Caucasians, studies have shown that NAFLD in Asians (including Indians) is strongly associated with metabolic disorders including glucose intolerance, DM, hyperlipidemia (high cholesterol and high triglyceride). In this study it has been found out that the prevalence of NAFLD in our study population is (n = 150) – 34% which is high enough to prompt for a protocol to initiate the screening of all obese diabetic patients for NAFLD. The study also showed the co-existence of a number of metabolic factors that directly contribute towards development of fatty liver and pose as an independent risk factor towards development of this disease. Thus tighter control of blood glucose level is the key to prevention. Obesity, uncontrolled diabetes, deranged lipid profile and abnormal liver enzymes are some of the risk factors for developing NAFLD. Thus screening must include all this risk factors and management strategies should address them separately.

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