ORIGINAL ARTICLE

Suspect and Screen by Ultrasound for Non-Alcoholic Fatty Liver Disease in Pre-Diabetic and Patients with Type 2 Diabetes Mellitus

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ABSTRACT

Background: Nonalcoholic fatty liver disease (NAFLD) is one the most common liver disorder. NAFLD is most likely to develop in Type 2 Diabetes Mellitus (T2DM). We aimed to get a better outlook of the dispersal of NAFLD in patients with T2DM.

Methods: An observational cross sectional study was conducted which included 100 patients with sugar levels greater than 140mg/dl and in diagnosed T2DM patients of both sexes. Alcohol & drugs are most common cause of fatty liver along with pregnancy so were not included in the study. Fatty liver was diagnosed on the basis of diffuse hyper-echoic echo texture, increased echo texture compared with kidneys, vascular blurring and deep attenuation.

Results: Out of 100 cases included in the study, 15 patients were pre-diabetic (BSR <179mg/dl) and 85 were diabetic (BSR>180mg/dl). Chi square was applied which shows p value of 0.001 (highly significant).

Conclusion: To Increase the awareness among the people regarding NAFLD in T2DM patients is essential. The prevalence of NAFLD is higher (78%) in T2DM patients & 8% in pre-diabetic patients.

Key words: Type 2 Diabetes Mellitus, Non-Alcoholic Fatty Liver Disease.

INTRODUCTION

Accumulation of fat in hepatocytes is termed as Fatty Liver[1]. If one is not taking alcohol and liver is fatty on ultrasound then it is termed as non-alcoholic fatty liver disease (NAFLD)[2, 3]. The sequalae of NAFLD ranges from steatosis to steatohepatitis and in some patients to carcinoma of liver[4]. NAFLD has a strong association and mostly seen with T2DM[6]. Fatty Liver has a significant influence on the severity of hepatic insulin resistance in T2DM patients. NAFLD is a chronic liver disease which is becoming very common day by day, worldwide. NAFLD is also becoming very common inAsian countries including Pakistan which may be due to the better life style, altered dietary habits (junk food) and the presence of new diagnostic tools. Mostly NAFLD is an incidental finding in T2DM. Common symptoms are malaise, fatigue and uneasiness in right upper abdomen. The conclusive evidence of NAFLD is based on the biopsy examination of liver which is an invasive expensive method. It is also related with many problems. Imaging of the liver with ultrasound, CT or MRI are acceptable for fatty liver detection. Ultrasound is the most commonly and widely used. It is cheap test and has 80% sensitivity and 98% specificity[5]. The features of NAFLD include presence of bright hepatic echotexture as compared with the kidneys, deep attenuation, and vascular blurring on ultrasonography. The study was done to know the association of NAFLD with T2DM.

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METHODS

This experimental cross-sectional study was conducted at the Department Radiology and Medicineof Ghurki Trust and Teaching Hospital Lahore, from June 2016 to November 2016. This study included 100 patients with random blood sugar level above 140mg/dl & diagnosed T2DM patients of both sexes. The patients who were taking alcohol,medicinesthat cause fatty liver and pregnancy were not included in the study. Informed consent was taken from the patients who were included in the study and they were evaluated by abdominal ultrasonography by a qualified sonologist who used Toshiba Xario-Prime (TUS-660) ultrasound machine for all patients to exclude instrumental bias. Texture of liver on ultrasound showing increased echotexture when compared with kidneys and deep attenuation was noted.There are three grades of fatty liver which are characterized on the bases of echogenicity of liver. Grade I fatty liver means increased hepatic echogenicity with visible periportal and diaphragmatic echogenicity. Increased hepatic echogenicity with imperceptible periportal echogenicity, without obscuration of diaphragm is classified as Grade-II.

While increased hepatic echogenicity with imperceptible periportal echogenicity and obscuration of diaphragm is termed as Grade-III.

Statistical analysis: SPSS version 23 was used to plot data and construct graphs. The p-value was determined using independent-samples T test which was 0.001 ($p<0.05$ is significant).

RESULTS

Out of 100 patients included in the study, 45 were male and 55 were female. 50% of the patients were in the age group between 40-49 yrs. Age distribution in different groups is given in Table-II. Blood sugar level between 140-179mg/dl was taken as pre-diabetic while blood sugar level greater than 180mg/dl was taken as Diabetes Mellitus type II. Out of 100 patients, 14 patients had normal liver parenchymal echotexture and turned out to be negative for NAFLD. Prevalence of NAFLD in pre-diabetic was 8% & in diabetics was 78%. Prevalence of NAFLD according to different grades in pre-diabetic and in diabetic patients is given in Fig. I & Table I. Linear association was seen between NAFLD and diabetes with a p value of 0.001 (highly significant). Minimum blood sugar level recorded was 140mg/dl and maximum was 468mg/dl. Blood sugar level grading is given in Fig. II.

Fig. I: Degree of fatty change

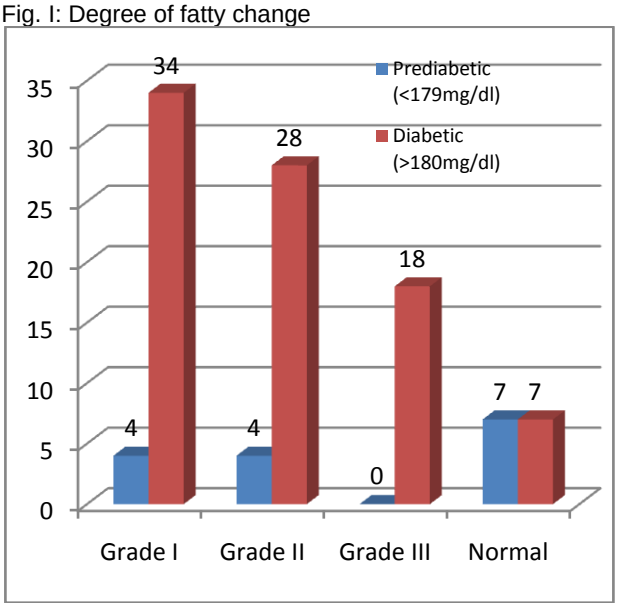


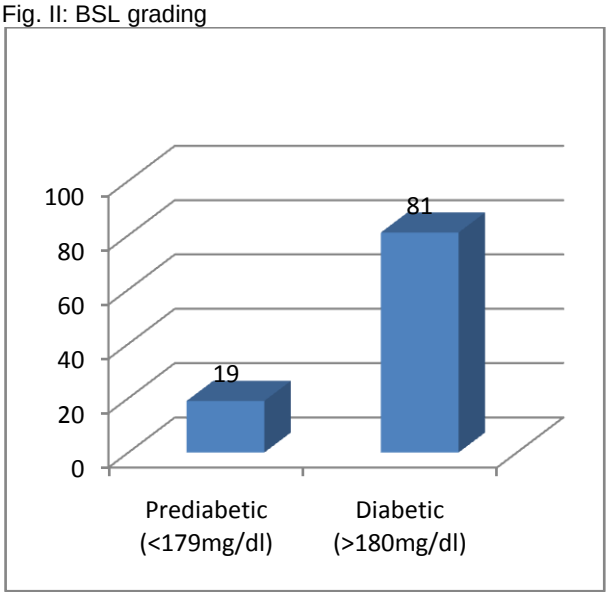
Table I: BSL Grading * Degree of Fatty Change

	Degree of Fatty Change			Normal	Total
	Grade-I	Grade II	Grade III		
Pre-Diabetic (<179mg/dl)	4	4	0	7	15
Diabetic (>180mg/dl)	34	28	16	7	85

Table II:

	Frequency	Percent
30-39 Yrs	16	16.0
40-49 Yrs	50	50.0
50-59 Yrs	26	26.0
60-70 Yrs	8	8.0
Total	100	100.0

Fig. II: BSL grading



DISCUSSION

NAFLD is characterized by accumulation of fat in the liver parenchyma without significant alcohol intake. It is a clinicopathological condition in which there is significant liver deteriorationstarting from fatty infiltration to inflammation of liver, progressive fibrosis andcirrhosis[2]. NAFLD is very common in conditions with insulin resistance e.g., T2DM, Obesity, dyslipidemia and the metabolic syndrome[6].

It is significantly common in type-II diabetic patients, in which 50% to 75% of the patients have fatty Liver detected by Ultrasonography. The link between fatty liver, diabetes mellitus and hyperlipidemia is well known[7, 8]. There were a few limitations in study we conducted. The diagnosis of NAFLD in our study was based on ultrasound& not confirmed by liver biopsy (gold standard). However, ultrasound is by for the commonest way of ruling-out NAFLD in general practice and can accurately identify infiltration of liver cells with fat with a sensitivity of 80% and specificity of 99%[9,10].

CONCLUSION

Nonalcoholic fatty liver disease is no longer considered a benign condition in patients with T2DM. The possibility of fatty liver disease should be entertained as a part of the routine evaluation of

patients with T2DM, in the same way we search for micro-vascular complications and cardiovascular disease. The result of this study showed that there was convincing correlation between NAFLD and patients with raised blood glucose levels. Ultrasound should be performed as a routine examination for every patient with raised serum blood sugar levels to identify and control the complications which can happen due to NAFLD. Awareness by healthcare providers is essential for an early diagnosis and timely implementation of lifestyle and pharmacological interventions.

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