Relation of Ultrasound Detected Non-Alcoholic Fatty Liver Disease and Dyslipidemia

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ABSTRACT

Background: Non-Alcoholic Fatty Liver Disease (NAFLD) has appeared as one of the most widespread hepatic disease in the Western nations which is now emergent in Asian nations also. NAFLD is escalating in patients with Type-II Diabetes. NAFLD seems to be seen in Indians, Philippinos and Malaysians. It is suggested to be a causative reason for hepatocellular carcinoma. T

Aim: To identify non-alcoholic fatty liver on ultrasonography and see for an association with serum lipid irregularities.

Methods: 100 cases composed of 45 males and 55 females, which were diagnosed with NAFLD on ultrasound examination were further studied with a complete serum lipid profile. Anevaluation of lipid irregularities among various categories of fatty liver spotted on ultrasound was performed. P value was considered by ANOVA test and a P value < 0.05 was measured as significant statistically.

Results: From 100 cases, which were confirmed as NAFLD on sonography, patients with grade I disease were 51%, grade II were 33% and grade III were 16%. Mean age of the patients was 45.23. Males were 45 and females were 55 in number. Serum triglycerides, LDL and VLDL levels were raised in 50%, 33%, 32% of the cases respectively. Decreased serum HDL levels were seen in 33% of patients. On analysis, it was revealed that as the grades of NAFLD were increased, meaningful correlation was seen with increasing values of triglycerides (P value < 0.05), LDL (P value < 0.05) and VLDL (P value < 0.022) and low HDL (P value < 0.05).

Conclusion: Majority of cases with NAFLD in Pakistan remain undetected. Although liver biopsy remains the gold standard in diagnosing NAFLD, ultrasound examination is an easily available, simple, non-invasive modality for new detection of NAFLD in asymptomatic patients. There seems to be a significant correlation between abnormal serum lipid levels and NAFLD.

Keywords: Dyslipidemia, fatty liver disease, ultrasonography

INTRODUCTION

NAFLD is currently being documented as an important health problem. The occurrence of fatty liver in the Indian subcontinent was reported to be as high as 15%-30%[1], which is comparable to that stated from the western world[2]. Previous studies showed that NAFLD had a benign progression. Lately it has been realized NAFLD can advance to fibrosis, cirrhosis, leading to liver failure and hepatocellular carcinoma[3].

Majority of patients diagnosed with NAFLD are asymptomatic at diagnosis. Hepatomegaly might be the only clinical presentation in patients[4]. Liver biopsy remains an excellent technique for the diagnosis of NAFLD. Yet, liver biopsy remains an invasive and painful ordeal[5]. It has potential complications which include bleeding and errors while sampling[6]. Apart from this, there is a growing figure of cases with ultrasound detected NAFLD, the practice of hepatic biopsy remains clinically & monetarily unfeasible.

To appraise and approve the utility of ultrasound to get a diagnosis of NAFLD is paramount. The current study's objective is to confirm NAFLD non-invasively by sonography and then relate sonographically confirmed NAFLD with serum lipid profile.

MATERIAL AND METHODS

After taking an informed consent this study was conducted between January 2016 and November 2016, in the Department of Radiology and Medicine, Ghurki Trust Teaching Hospital, Lahore. There were a total of 100 patients out of which 45 were males and 55 females. These patients were assessed sonographically for fatty liver. Patients of 20 years and above diagnosed with NAFLD by ultrasound were included in the study. Patients with a history of alcohol intake were not included in the examination. The sonographic examinations were carried out on Toshiba Xario Prime Ultrasound with
Grading of non-alcoholic fatty liver on ultrasonography is as follows:
Grade I: Slightly increase in the echotexture. Liver presents as bright compared to the cortex of the kidney (Figure II A).
Grade II: Moderately diffuse increased echogenicity of liver with slight decreased visualization of the intrahepatic vessels. (Figure II B).
Grade III: Significant increase in the echotexture with poor/no visualization of intrahepatic vessels and diaphragm along with poor penetration of the posterior portion of the right hepatic lobe (Figure II C).
The cases diagnosed as NAFLD on sonography were also checked for serum lipid profile. Lipid profile was measured by taking fasting blood sample level and processing it in Microlab-300 (semi-automation) machine and was interpreted by qualified technologist.

Statistical analysis: The results were recorded on SPSS 23. Mean values, standard deviation, charts were calculated. P value was calculated by using ANOVA & value <0.05 was considered statistically significant.

RESULTS
From a total of 100 sonographically determined NAFLD cases were counted in the study. Figure I demonstrates the age of the patients. Patients in the third & fourth decade of their lives formed majority of the patients (76%). The ultrasonography results showed NAFLD with grade I in 38%, grade II in 32% and grade III in 16% of the patients included in the study. Serum triglycerides, LDL and VLDL levels were raised in 50%, 33%, 32% of patients correspondingly. Decreased serum HDL levels were noticed in 33% of patients. P-value for LDL, VLDL, triglycerides in different grades of NAFLD is shown in Table-I. Noteworthy association was also found between serum triglyceride levels and increasing grades of ultrasonographically diagnosed NAFLD. NAFLD in different age groups is given in Table II.

DISCUSSION
Occurrence of NAFLD is increasing in the Asian region. There is an increase in fat in the diet accompanied by minimal physical exercise. A 2.6 times increase in occurrence of NAFLD was established in association with T2DM. NAFLD can lead to end stage liver disease that includes cirrhosis and has been proposed to culminate in hepatocellular carcinoma. Only a few, sonographic based studies have been documented from Pakistan in NAFLD patients.
This study was performed with the aim of diagnosing NAFLD on ultrasound in those patients who were asymptomatic or with vague symptoms like abdominal pain, fatigue, malaise. The age of the patients was between 25 years to 65 years. Only a few studies have documented the mean age of...
NAFLD patients are between 45 -55 years. Patients presenting with NAFLD are mostly asymptomatic. In our study, low HDL was observed in 33% cases. Roli Agrawal saw low HDL in 45.16% of patients. In our study serum triglycerides, serum HDL, serum LDL and VLDL were raised in patients with rising grades of NAFLD suggesting a strong correlation and statistical significance ($P<0.05$).

The accumulation of fat within hepatocytes, typically as triglycerides, is a precondition for the change into nonalcoholic fatty liver disease. Insulin resistance remains the most significant factor in the occurrence of nonalcoholic fatty liver disease. Liver biopsy remains the gold standard for the diagnosis of NAFLD. But, due to the fact of it being an invasive procedure with potential complications of bleeding and sampling errors, it does not remain a feasible diagnostic tool for every asymptomatic patient. For this very reason ultrasonography is a very good means to diagnose NAFLD which is augmented by appreciably raised lipid profile values observed in our patients.

Ultrasonography can be employed for the early recognition of NAFLD. Ultrasonographically diagnosed NAFLD patients exhibited substantial relationship with serum lipid profile. Ultrasound remains the most inexpensive modality for perceiving changes correlating with NAFLD and tends to minimize undergoing complex, expensive and dreary investigations in such patients and asymptomatic cases.

**CONCLUSION**

Using of ultrasonography in the early detection of NAFLD and its association to the extent of dyslipidemia at various stages of disease progression should assist grade the liver damage in NAFLD. Liver biopsy can simply be replaced by ultrasonography as it can be life threatening. Complications, which include bleeding and sampling errors can occur. But ultrasonography is easily accessible, non-invasive and a simple tool. It can be helpful for the early detection of NAFLD in asymptomatic patients also. The routine of ultrasonography is therefore, clinically and monetarily practical for the early diagnosis of patients with NAFLD. Diagnosis of NAFLD and dyslipidemia can help prompt further investigations to diagnose metabolic syndrome commonly accompanying with NAFLD, instigating an early diagnosis, ensued by early treatment.

**REFERENCES**


