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RESEARCH ARTICLE

ASSESSMENT OF NON-ALCOHOL FATTY LIVER CHANGES IN OBESE PATIENTS ON BASIS OF ULTRASOUND

***Dr. Samia Perwaiz Khan, Dr. Sofia Izhar and Dr. Fadieleh A. Sohail**

Department of Pharmacology, Radiology, Medical Education, Jinnah Medical and Dental College, Pakistan

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ABSTRACT

Non alcohol fatty liver diseases (NAFLD) is the most common chronic liver diseases and the early diagnosis is essential to prevent complications. There is need for development of noninvasive tool to determine the severity. Non alcoholic fatty changes in liver may be present in obese and diabetic patients and thus will alter the management. Since ultrasound is noninvasive technique for the diagnosis of fatty liver diseases in comparison with liver biopsy. While performing ultrasound abdomen, liver echogenicity can be homogenous and normal, slightly diffused increased echogenicity or markedly increased echogenicity (alteredtexture changes multiple, nodular or irregular hyperechogenic lesions) with poor or non-visulization of intrahepatic vessels. This was the method for grading of fatty changes in liver and also compared the size. As determined the echogenicity and increase in size were found to have direct relationship..In this article the type of echogenicity changes along with variation in size of liver were recorded. Age did not have much significance, but it was seen that greater number of female obese patients.

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INTRODUCTION

The prevalence of NAFLD has shown to much higher than was previously reported. The use of ultrasound to screen obese population for detection of non-alcohol fatty liver diseases, there is requirement for an accurate, non-invasive, and easily available technology for the diagnosis of NAFLD in the asymptomatic patient. Williams *et al*., (2011). Major Risk factors for NAFLD are diabetes, obesity with body mass index (BMI) greater than 30, hepatomegaly, and hyperlipidemia (Riley *et al.,* 2006). Railey et al shown for Ultrasound of fatty liver include any 4 sonographic features: attenuation of image quickly within 4-5 cm of depth; echogenic diffusely but particularly important to note brightness within the first 2-3 cm of depth; liver uniformly heterogeneous; thick subcutaneous depth (> 2 cm); and liver fills entire field with no visible edges (Hassan *et al.,* 2014). Ultrasound is the first-line imaging test for patients with suspected steatosis (good accuracy if >30% of hepatocytes are steatotic) (Dyson *et al.,* 2014). A 3.5-MHz transducer was used to obtain the following images: sagittal view of the right lobe of the liver and right kidney, transverse view of the left lateral segment of the liver and spleen, transverse view of the liver and pancreas, and any focal areas of altered echotexture.

Corresponding author:* **Dr. Samia Perwaiz Khan,
Department of Pharmacology, Radiology, Medical Education, Jinnah Medical and Dental College, Pakistan.

The severity of echogenicity was graded as follows: grade 0, normal echogenicity; grade 1, slight, diffuse increase in fine echoes in liver parenchyma with normal visualization of diaphragm and intrahepatic vessel borders; grade 2, moderate, diffuse increase in fine echoes with slightly impaired visualization of intrahepatic vessels and diaphragm; grade 3, marked increase in fine echoes with poor or nonvisualization of the intrahepatic vessel borders, diaphragm, and posterior right lobe of the liver. Sonographic patterns included the following: 0, homogeneous, normal; 1, hyperechoic nodules; 2, multiple, confluenthyperechoic lesions; 3, hypoechoic skip nodules; 4, irregular hyperechoic and hypoechoic areas; 5, diffuse involvement (Saadeh *et al.,* 2002). The aim of this study was to determine the fatty changes seen in ultrasound liver of obese patients and relationship to age and gender.

MATERIALS AND METHODS

Out of sample of 50 obese patients obtained from ultrasound department of Medicare hospital. The overweight or obese patients were included in this study from Radiology department. Sony system of ultrasound with a transducer of 3.5 MHZ. Sagittal view of right lobe of liver and right kidney, transverse view of liver and pancreas along with view of diaphragm was taken. Grade 0: normal echogenicity, Grade1/2: slightly diffused and increased echogenicity Grade 3: marked increased echogenicity with poor or non-visualized intrahepatic vessels.

Table 1. Echogenic changes of liver in obese patients

Ultrasound Liver	NO of obese patients N=50	Size Of Liver	Percentage
Mild/ Moderate Echogenicity	12	11-14.6 cm	24%
Severe Echogenicity	38	16.3- 19.8 cm	76%
Altered texture	2		
Age	28 – 82 years		
Gender	Female- 40 Male - 10		

RESULTS

As seen in this study out of total of fifty ultrasound abdomen/liver of obese patient where found to have mild/moderate to severe fatty changes in liver. Also found that those patients showing severe changes also showed mild to moderate hepatmegaly.

Table 1: Grade 1 were 12(24%) and grade 3 were 38(76%) along with hepatomegaly. Also two patients had altered texture and reduced size of liver. Age had no effect but females showed higher incidence of fatty liver.

DISCUSSION

The over weight or obese patients out of which 24% had mild to moderate echogenic changes in liver and 76% had increased echogenicity suggestive of fatty infiltration and diminished vascular markings. With loss of vas Ultrasound has been evaluated as a non-invasive method of diagnosing NAFLD with the presence of characteristic sonographic findings. Previous studies suggest characteristic sonographic findings for NAFLD include bright hepatic echoes, increased hepatorenal echogenicity, vascular blurring of portal or hepatic vein and subcutaneous tissue thickness (Khov *et al.,* 2014). Fatty liver is the increased echogenicity of liver parenchyma suggestive of fatty infilteration. Nonalcoholic fatty liver disease , the presence of fat infiltration in the liver in the absence of excessive alcohol consumption and other causes of liver disease, is the most common cause of fatty liver, with a prevalence as high as 30% in many populations (Lee *et al.,* 2010) NAFLD may lead to fibrosis, cirrhosis, liver cancer (Baršić *et al.,* 2012). Sonography allows for reliable and accurate detection of moderate-severe fatty liver, compared to histology. Low cost, safety, and easy accessibility, ultrasound is the imaging technique of choice for screening for fatty liver in clinic and hospital settings (Chen *et al.,* 2008). Findings of fatty liver include hepatomegaly, diffuse increases in the echogenicity of the liver parenchyma, and vascular blunting. Nonsteatotic hepatic parenchyma exhibits an echotexture similar to that of renal parenchyma, but becomes ‘‘brighter” when infiltrated with fat (Obika and Noguchi, 2012).

Conclusion

Improved resolution of ultrasound has been beneficial in determining non-invasively, non-alcohol fatty liver changes and early life style modification are beneficial to prevent complications.

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