Original article:

Analysis of Ultrasound Findings in Chronic Liver Disease Patients: An Institutional Based Study

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ABSTRACT

Background: Chronic hepatitis and hepatic cirrhosis are pathologies with high prevalence in the world population. The association of high amplitude echoes returned from the liver and advanced cirrhosis is well recognized. The pattern is very characteristic but non-specific in pathological terms. Hence; the present study was undertaken for assessing ultrasound findings in chronic liver disease patients.

Materials & Methods: A total of 50 patients with chronic liver diseases were enrolled in the present study. Chronic liver disease can be defined as a process that affects the hepatocytes and interferes with liver function. Ultrasound examinations together with biochemical tests of the liver were the first diagnostic procedures requested at the initial visit. Ultrasound diagnosis was established before knowing the results in all cases. All the reading were analysed by experienced and skilled radiologists. All the results were recorded in Microsoft excel sheet and were analysed.

Results: Normal findings were found to be present in 6 percent of the patients. Hepatomegalia and Homogeneous bright findings were found to be present in 6 percent and 14 percent of the patients. In the present study, Heterogeneous bright, Nodular and Chronic hepatitis findings were found to be present in 24 percent, 10 percent and 14 percent of the patients. Liver cirrhosis and Fatty infiltration was found to be present in 16 percent and 10 percent of the patients.

Conclusion: Many liver diseases have long natural histories, and there are few treatments that can directly alter their course. Hence; ultrasound is an effective diagnostic technique in evaluating the patients with chronic liver diseases.

Key words: Ultrasound, Liver, Disease.

INTRODUCTION

Chronic hepatitis and hepatic cirrhosis are pathologies with high prevalence in the world population. Ultrasound (US) allows for a quick and precise examination of the liver parenchyma, the vascular structures, the biliary tract, and the abdominal cavity. Changes can be detected in the pattern of liver echostructure that suggest the presence of chronic liver disease, portal hypertension, and the presence of liver tumors. Moreover, US guidance provides an easy way for performing interventional procedures, such as biopsies for classifying the degree and type of liver disease, biopsies of focal liver lesions, and the application of percutaneous treatments for hepatocellular carcinoma (HCC).[1-3]

The major clinical consequences of cirrhosis are impaired hepatocyte (liver) function, an increased intrahepatic resistance (portal hypertension) and the development of hepatocellular carcinoma (HCC). The general circulatory abnormalities in cirrhosis (splanchnic vasodilation, vasoconstriction and hypoperfusion of kidneys, water and salt retention, increased cardiac output) are intimately linked to the hepatic vascular alterations and the resulting portal hypertension. Cirrhosis and its associated vascular distortion are traditionally considered to be irreversible but recent data suggest that cirrhosis regression or even reversal is possible.[4,5]

The association of high amplitude echoes returned from the liver and advanced cirrhosis is well recognized. The pattern is very characteristic but non-specific in pathological terms.[6]

Hence; the present study was undertaken for assessing ultrasound findings in chronic liver disease patients.

MATERIALS & METHODS

The present study was conducted in the Department of Radiology, Padmashri Dr. Vithalrao Vikhe Patil Foundation's Medical College & Hospital, Ahmednagar, Maharashtra (India) and it included evaluation of ultrasound findings in patients with chronic liver disease.

Written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 50 patients with chronic liver diseases were enrolled in the present study. Chronic liver disease can be defined as a process that affects the hepatocytes and interferes with liver function. Ultrasound examinations together with biochemical tests of the liver were the first diagnostic procedures requested at the initial visit. Ultrasound diagnosis was established before knowing the results in all cases. Ultrasonography was carried out using a real-time scanner with sector transducer.

All the reading were analysed by experienced and skilled radiologists. All the results were recorded in Microsoft excel sheet and were analysed. Chi- square test was used for assessment of level of significant.

RESULTS

In the present study, assessment of a total of 50 patients with chronic liver disease was done. Among these patients, 40 percent belonged to the age group of more than 50 years. 36 percent belonged to the age group of 30 to 50 years while the remaining 24 percent belonged to the age group of less than 30 years. 78 percent of the patients were males while the remaining were females. 58 percent of the patients had rural residence while the remaining had urban residence.

On ultrasound examination, Normal findings were found to be present in 6 percent of the patients. Hepatomegaly and homogeneous bright findings were found to be present in 6 percent and 14 percent of the patients. In the present study, heterogeneous bright, nodular and chronic hepatitis findings were found to be present in 24 percent, 10 percent and 14 percent of the patients. Liver cirrhosis and Fatty infiltration was found to be present in 16 percent and 10 percent of the patients.

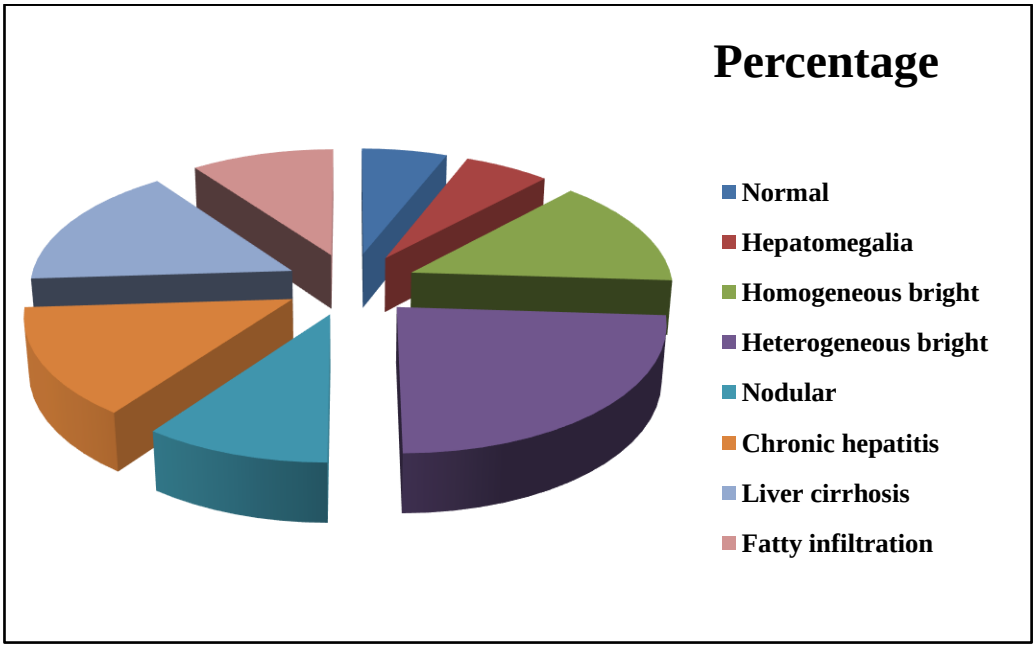
Table 1: Age-wise and gender-wise distribution

Parameter		Number	Percentage
Age group (years)	Less than 30	12	24
	30 to 50	18	36
	More than 50	20	40
Gender	Males	39	78
	Females	11	22
Residence	Rural	29	58
	Urban	21	42

Table 2: Ultrasonography findings

Ultrasonography findings	Number of patients	Percentage
Normal	3	6
Hepatomegalia	3	6
Homogeneous bright	7	14
Heterogeneous bright	12	24
Nodular	5	10
Chronic hepatitis	7	14
Liver cirrhosis	8	16
Fatty infiltration	5	10
Total	50	100

Graph 1: Ultrasound findings



DISCUSSION

Chronic liver disease is one of the leading cause of death with more than 25,000 deaths annually according to federal statistics. Other chronic liver diseases that have no treatments include α1-antitrypsin deficiency, cryptogenic hepatitis, and primary sclerosing cholangitis. Some liver diseases, such as primary biliary cirrhosis, have treatments that delay progression but do not halt the liver injury. Many of these diseases progress slowly from hepatitis to cirrhosis, often over 20 to 30 years.[4-6] With an inability to cure the primary disease process, it becomes important to prevent further exacerbation and optimize the length of time between hepatitis and cirrhosis. Once cirrhosis occurs, nothing currently can be done to reverse the process. Individuals with early cirrhosis may live on average 10 to 15 years before liver transplantation or death. Preventive strategies can maximize this time by avoiding further damage and mitigating comorbidity.[7-9] Hence; the present study was undertaken for assessing ultrasound findings in chronic liver disease patients.

In the present study, assessment of a total of 50 patients with chronic liver disease was done. Among these patients, 40 percent belonged to the age group of more than 50 years. 36 percent belonged to the age group of 30 to 50 years while the remaining 24 percent belonged to the age group of less than 30 years. 78 percent of the patients were males while the remaining were females. 58 percent of the patients had rural residence while the remaining had urban residence. On ultrasound examination, Normal findings were found to be present in 6 percent of the patients. Hepatomegalia and Homogeneous bright findings were found to be present in 6 percent and 14 percent of the patients. Martínez-Noguera A et al studied the correlation of ultrasound patterns with laparoscopy and biopsy results in 140 patients with chronic liver disease (CLD). Of the 23 patients with a normal ultrasound pattern (N), biopsies revealed CLD in 18; in the 22 patients with unspecific hepatomegaly (H), biopsies disclosed CLD in 20; and in the 64 patients with a homogeneous bright pattern (HB), biopsies showed CLD in 62. All 22 cases of heterogeneous bright pattern (HTB) and all 9 patients with nodular pattern (ND) had CLD. In conclusion, it appears that the HTB and nodular ultrasound patterns confirm the presence of CLD, the HB pattern is suggestive of CLD, but diagnosis of CLD cannot be made from N and H patterns.[9]

In the present study, Heterogeneous bright, Nodular and Chronic hepatitis findings were found to be present in 24 percent, 10 percent and 14 percent of the patients. Liver cirrhosis and Fatty infiltration was found to be present in 16 percent and 10 percent of the patients. Nishiura T et al analysed the diagnostic sensitivity and accuracy of ultrasound (US) using both low frequency and high frequency probes as a repeatable, inexpensive, and reliable method to determine the fibrosis stage in chronic liver disease and then compared our results with the histological findings. A total of 103 patients with chronic liver disease (60 males and 43 females, average age 51 years old) who had undergone both a liver biopsy and US with 2-5 MHz frequency and 5-12 MHz frequency probes were prospectively evaluated in this study. An US scoring system using both the low frequency and high frequency probes was performed by evaluating the edge, surface and parenchymal texture of the liver. Each score was obtained by evaluating three parameters; the bluntness of the liver edge, the irregularity of the surface and the coarseness of the parenchymal texture were evaluated and then compared with the histological findings. The US scores of the liver edge (rs: 0.6668), liver surface (rs: 0.9007) and liver parenchymal texture (rs: 0.8853) correlated significantly with the fibrosis stage obtained based on the biopsy findings. The accumulated US scores of these three parameters, however, was found to be the most reliable indicator (rs: 0.9524). Patients with an accumulated score of 6.5 or more were all found to have fibrosis stage 4

in which the accuracy of our scoring system for correctly predicting cirrhosis was found to be 100% sensitive. When an accumulated US score of 3 was interpreted to indicate mild fibrosis (a fibrosis score of 0 or 1), all 42 patients with stage 0 or 1 fibrosis were found to have an accumulated US score of 3 or less (a probability of 100%) and 42 of 53 patients with a score of 3 or less were found to have stage 0 or 1 fibrosis (specificity of 79.2%). An ultrasound evaluation of the liver fibrosis stage based on the scoring system using both low and high frequency probes was found to be a reliable and effective alternative to the histological staging in chronic liver diseases.[10]

CONCLUSION

From the above results, it can be concluded that many liver diseases have long natural histories, and there are few treatments that can directly alter their course. Hence; ultrasound is an effective diagnostic technique in evaluating the patients with chronic liver diseases.

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