Ultrasound Evaluation of Liver in Patients Who Had History of Hepatitis C

Shahzeen Rauf*
Bachelors in Medical Imaging Technology, Department of Allied Health Sciences, Superior College Lahore, University Campus, 17-KM Raiwaind Road, Kot Arain, Lahore, Pakistan

Rubbab Razzaq
Bachelors in Medical Imaging Technology, Department of Allied Health Sciences, Superior College Lahore, University Campus, 17-KM Raiwaind Road, Kot Arain, Lahore, Pakistan

Kinza shahdat
Bachelors in Medical Imaging Technology, Department of Allied Health Sciences, Superior College Lahore, University Campus, 17-KM Raiwaind Road, Kot Arain, Lahore, Pakistan

Anam mirza
Bachelors in Medical Imaging Technology, Department of Allied Health Sciences, Superior College Lahore, University Campus, 17-KM Raiwaind Road, Kot Arain, Lahore, Pakistan

Awais hassan
Bachelors in Medical Imaging Technology, Department of Allied Health Sciences, Superior College Lahore, University Campus, 17-KM Raiwaind Road, Kot Arain, Lahore, Pakistan

Sana ali
Masters in diagnostic ultrasound, Lecturer, Department of Allied Health Sciences, Superior College Lahore, University Campus, 17-KM Raiwaind Road, Kot Arain, Lahore, Pakistan

Bilal shah
MBBS, FCPS in children hospital lahore

Rana Muhammad Athar Azeem Shams
Masters in Medical Imaging Technology, Lecturer, Department of Allied Health Sciences, Superior College Lahore, University Campus, 17-KM Raiwaind Road, Kot Arain, Lahore, Pakistan

Rana Muhammad Bakhtawar Khan Sajawal
Masters in Mathematics, Lecturer, Department of Allied Health Sciences, Superior College Lahore, University Campus, 17-KM Raiwaind Road, Kot Arain, Lahore, Pakistan

Abstract

Background: Hepatitis is an infection of liver. The disorder can be self-limiting or lead to fibrosis(scarring), cirrhosis, or liver cancer. Both acute infection and chronic sequelae, such as hepatitis C, cause significance morbidity and mortality in the hum of population. Hepatitis can be very high in general population. Our study evaluate the liver parenchyma in patients with history of Hepatitis C and provide descriptive to prevent future liver pathologies.The primary goal of our research is to delay or perhaps stop the progression of liver fibrosis, as well as to prevent liver disease.Grey scale ultrasonography has been reported to detect Ultrasonographic features of chronic disease resulting in decreased liver function and ultimately, liver failure and to help the patients with cured hepatitis C to check out the parenchymal damage and to give healthy lifestyle.

Objective: To evaluate the ultrasonographic features of the liver in the patients who had history of hepatitis C.

Study design: ur study design was retro prospective.

Material and method: The retro prospective study was conducted in which data of 56 patients were taken. The data was collected from the radiology department of al-Razi health care and Jinnah hospital. After informed consent, data was collected through ultrasound machine. Out of 56 patients 27 were females and 29 were males. study duration was 4 months. Inclusion criteria includes patients with history of liver hepatitis C. Exclusion criteria was patients with other causes of liver disease, primary biliary cirrhosis, metabolic liver disease and liver transplant recipients except hepatitis C.

Result: 56 patients were included in our study out of which 27 were females and 29 were males. The ultrasonographic findings of the patients having liver hepatitis C shows the cirrhosis in 44.6%, change in liver

contour in 37.5%, nodularity in 42.9% and vascular changes in 58.9%.

Conclusion: Some extent of hepatitis C diseases cannot be seen on CT or MRI but can be seen on grey scale ultrasonography due to its high resolution .so, it can be concluded that the grey scale ultrasonography is more efficient and authentic diagnostic equipment in assessing the liver hepatitis C as compared to the CT.

Introduction:

Hepatitis is an infection of liver. The disorder can be self-limiting or lead to fibrosis(scarring), cirrhosis, or liver cancer.[1] Hepatitis C infection, chronic liver damage, chronic active hepatitis, cirrhosis, and primay liver cancer are all major causes of morbidity and mortality in the human population.[2]Over the course of a 20year period, 69 percent of persons with hepatitis C will develop cirrhosis, and 1% – 5% may develop hepatocellular carcinoma (HCC). Hepatitis C has become a key indication for liver transplant (LT) due to the global prevalence of the disease.)[3] Analysis of prevalence data for the National Health and Nutrition Examination Survey 2003-2010 showed that nearly three-quarters of people with chronic hepatitis C in the United States were in the 1945-1965 birth group. The incidence of hepatitis C infection every year from 2009 to 2017. Most of the new hepatitis C infections occurred in people born after 1965, with the majority of cases between the ages of 20 and 39. (4) A total of 868,523 hospitalizations with HCC were identified (25.5% CC, 25.3% ESLD, 8.6% HCC and 2.5% LT). Acceptance and overall mortality rates increased from 2000-2003 to 2004-2007, but after 2008 these rates stabilized and / or decreased. [4, 5].Hepatitis C infection that persist over many years can cause major complications, such as after decades of hepatitis C infectioion, cirrhosis may develop. The ability to function is hampered by scarring. Hepatitis C infection can lead to liver cancer in a tiny percentage of persons, and extensive cirrhosis can cause the liver to fail. [6]Much evidence indicates that metabolic disorders induced by hepatitis C contribute to the development of cirrhosis and potentially lead to the development of other disorders that are usually associated with altered metabolism, particularly atherosclerosis.In this review, we'll look at the connections between hepatitis C and insulin resistance, hepatic lipidosis, and diabetes, as well as the effects of these interactions on the progression of cirrhosis and atherosclerosis. [7]

Ultrasound of the abdomen is one of the most common imaging examinations in medicine, and it has great value in exploring the parenchymal organs, especially the liver. It provides information on the structure of the liver and blood supply, but also on possible pathological processes that may occur in or around the liver. Provides information on liver parenchyma size, circumference, and resonance. A normal liver parenchyma has a relatively rough echogenic tissue and its echo is similar to that of the spleen. [8] [9]Abnormal liver or cirrhosis varies in color, size, and appearance, depending on the etiology. They can be large and green in diseases with biliary obstruction, they are solid and appear infinitesimal or large in size as a result of the formation of regenerative nodules with surrounding fibrosis in the liver parenchyma, and lesions of the liver parenchyma can be grouped. Into three classes - diffuse, focal and multifocal - all of which have the potential to induce changes in the size, shape, and echogenicity of the liver. [10]It is best to make the diagnosis with ultrasound technology with a 3.5-8MHz curved probe in normal patients. Evaluation of chronic liver disease using abdominal ultrasound technology includes evaluation of liver size, echo texture and parenchyma of liver, liver nodule, liver surface, intrahepatic vessels, portal vein diameter and its complications such as spleen size, ascites and collaterals. In general, it allowed the ultrasound technologists to identify subtle changes in liver tissue and identify smaller lumps in the liver. [11]

The aim of our study is to evaluate the liver parenchyma in patients with history of hepatitis C and to provide descriptive data to prevent future liver pathologies. The major goal of our study is to slow or even reverse the progression of liver fibrosis and to prevent development of liver related complication and histologic Changes in the liver prior to Analyze the factors associated with histological Changes. Grey scale ultrasonography has been reported to detect ultrasonographic features of chronic disease resulting in decreased liver function and ultimately, liver failure and to help the patients with cured hepatitis C to check out the parenchymal damage and to give them a healthy lifestyle.

Material and Method

The Retro prospective study was conducted in which data of 56 patients were taken. The data was collected from the radiology department of al-Razi health care and Jinnah hospital. After informed consent, data was collected through ultrasound machine. Out of 56 patients 27 were females and 29 were males. study duration was 4 months. Inclusion criteria includes patients with history of liver hepatitis C. Exclusion criteria was patients with other causes of liver disease ,primary biliary cirrhosis, metabolic liver disease and liver transplant recipients except hepatitis C.

Result:
56 patients were included in our study out of which 27 were females and 29 were males. The ultrasonographic findings of the patients having liver hepatitis C shows the cirrhosis in 44.6%, change in liver contour in 37.5%, nodularity in 42.9% and vascular changes in 58.9%.

Discussion:
It was a retro prospective analysis in which 56 patients of liver hepatitis C are involved. Ali Mansoor conducted a study to determine the diagnostic accuracy of ultrasound to predict the presence of cirrhosis induced by hepatitis C .their study concluded that there was no association between the gender.137 were male 63 were female . The overall sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of doppler ultrasound for predicting the presence of hepatitis C were 88.98%,89.04%,93.00%,82.28%and 89.00%, respectively.

Antonietta Romano conducted a study to assess the incidence of newly diagnosed liver cancer and associated risk factors in patients with advanced hepatitis C who were treated with DAA, a potential registration database for all patients with hepatitis C. exclusion criteria were: child-Turcotte-Pugh-C, liver transplantation prior to DAA, history of presence of HCC, follow up less than 4 weeks after initiation of DAAs. This study concluded that a total of 29% of HCC patients had a violent tumor, often presenting in the early stage of treatment.

In our study the ultrasonography shows the cirrhosis in 44.6%, changes in liver contour in 37.5%, portal hypertension in 57.1%, nodularity in 42.9%, liver parenchymal changes in 51.8% and vascular changes in 58.9**%. Pierre nahon** conducted a research study to investigate the effect of sustained virological response (SVR) on the outcome of patients with hepatitis C and compensated cirrhosis. We collected information from 1,323 patients selected for accompanying viral cirrhosis (CirVir) from the National Agency for Research and Impending Viral Hepatitis (ANRS), selected from 35 clinical centers from 2006 to 2012. All patients were affected by viral hepatitis and cirrhosis. This study concluded that Metabolic characteristics have been associated with an increased risk of HCC in patients with SVR, but not in patients with viremia. Similar results were obtained in a population identical to the degree of propensity. **Toshikuni Suda** conducted a study to investigate hepatitis C and patients with sustained viral response (SVR). Among them, 136 patients were infected with hepatitis C patients did not receive antiviral treatment and 51 patients received antiviral treatment. **Takahisa Sato** retrospectively reviewed that ultrasound is the most frequently used method for monitoring chronic HCC in patients with chronic hepatitis C. A total of 243 nave HCC cases were detected among 1,431 patients with chronic hepatitis C in the outpatient setting. HCC was first detected by ultrasound in 221 patients. Cirrhosis patients were likely to be interviewed at shorter periods. Tumor size exceeded 30 mm in only three cases (1.4%). This study concluded that Ultrasound surveillance over a period of six months was generally appropriate for identifying HCC of less than 30 mm.

Our study concluded that ultrasonography was more efficient diagnostic equipment in assessing the liver hepatitis C as compared to CT and MRI. A study represented by Tomasz **Cieciuraa** included 120 patients (43 (35.83%) women and 77 (64.17%) men), according to the HCV genotype: 109 (90.8%) G1 patients, 8 (6.7%) with G3 and 3 (2.5%) with G4. In group G1, the G1b subtype was diagnosed in 101 patients and G1a in one patient. In 7 cases, there was no sub gene analysis. The mean age of the patients was 58.8 (IQ: 48.6-63.2) years, and the mean time after LTX was 92.7 (IQ: 59.8-124.5) months. In the study group, 76 patients (63.3%) had a history of previous interferon treatment failure. There was another study conducted by **Siri nawasatien** conducted this study by reviewing medical records of all criteria for chronic hepatitis C inclusion from patients over the age of 18 years who were diagnosed with hepatitis C virus by detecting HCV RNA in plasma, and who had not Previously receiving anti-hepatitis C drugs. This study concluded that treatment before a CVA procedure. We excluded patients who had been infected with hepatitis B virus (HBV) or human immunodeficiency virus (HIV) and who had a history of alcohol abuse or abstinence from alcohol. Muscle, or mitochondrial antibodies, and had a significant elevation of liver enzymes. **Amr Shaaban Hanafy** and others conducted a research study that included patients infected with chronic hepatitis virus (n = 180) and 60 healthy people as a control group, all of whom matched their age, gender, and body mass index. Based on clinical, laboratory, ultrasound and Fibro Scan functions. Eligible patients were diagnosed with cirrhosis secondary to hepatitis C virus infection which was demonstrated by positive testing for hepatitis C virus and HCV-RNA in serum, and they were divided into two groups: Group 1 which included 90 patients with EV-complicated liver cirrhosis. And group 2, which included 90 cases of cirrhosis. Patients without EV. Group 3 consists of controls. **George N. Ioannou** performed a study of 48,151 patients with hepatitis C-related cirrhosis (HCV) in the National Veterans Health Administration who had at least 3 years of follow-up after a diagnosis of cirrhosis. This study concluded that Patients were identified by performing at least one positive HCV RNA test between January 1, 2000 and January 1, 2016, and were followed up with a diagnosis of cirrhosis on January 1, 2019, in order to develop an HCC incident.
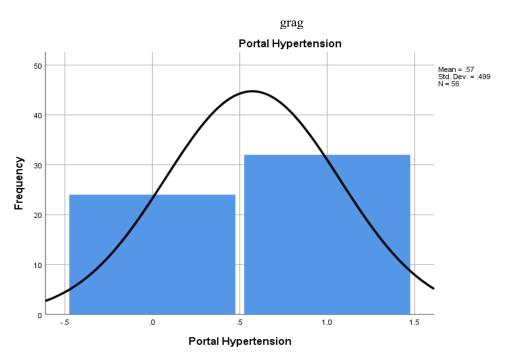
According to our study ultrasonography was the most efficient tool in detecting the liver hepatitis C because the cirrhosis, liver parenchymal changes, nodularity, portal hypertension and vascular changes were found more efficient on grey scale ultrasonography and also helpful in the detection of other types of liver disease that are associated with the liver

Conclusion:
Some extent of hepatitis C diseases cannot be seen on CT or MRI but can be seen on grey scale ultrasonography due to its high resolution .so, it can be concluded that the grey scale ultrasonography is more efficient and authentic diagnostic equipment in assessing the liver hepatitis C as compared to the CT.
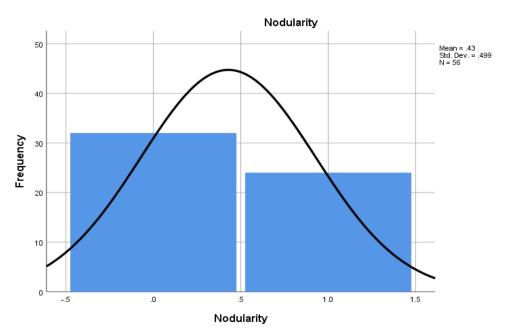
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graph shows the frequency of portal hypertension on ultrasonography

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Graph shows the frequency of nodularity on ultrasonography

		Gender	Cirrhosis	Changes in liver contour	Portal Hypertension	Nodularity	Liver Parenchymal Changes	Vascular Changes
N	Valid	56	56	56	56	56	56	56
	Missing	0	0	0	0	0	0	0
Mean		.52	.45	.38	.57	.43	.52	.59
Median		1.00	.00	.00	1.00	.00	1.00	1.00
Std. Deviation		.504	.502	.489	.499	.499	.504	.496
Minimum		0	0	0	0	0	0	0
Maximum		1	1	1	1	1	1	1
Percentiles	25	.00	.00	.00	.00	.00	.00	.00
	50	1.00	.00	.00	1.00	.00	1.00	1.00
	75	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Statistics

Table-8: shows the statical values of the gender ,ultrasonographic findings ,cirrhosis,changes in liver contour,portal hypertension,nodularity,liver parenchymal changes and vascular changes.
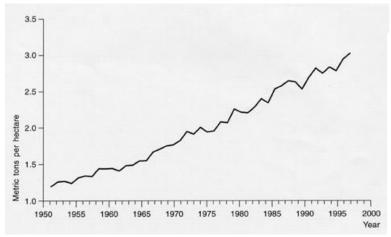

Figure 1. The Trend of Economic Development
Description for the above figure.