Frequency of Hepatocellular Carcinoma Related To Hepatitis C on Multidetector Computed Tomography

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ABSTRACT

BACKGROUND
Hepatitis C is a common liver illness that affects people all over the world. It is caused by the Hepatitis C Virus (HCV) and a significant number of patients develop chronic hepatitis, hepatocellular carcinoma, and liver cancer as a result. Hepatocellular Carcinoma (HCC) is a type of liver cancer that can be detected when a person has hepatitis B, C, diabetes, obesity, or alcohol addiction. It is diagnosed with the help of Multi - Detector Computed Tomography (MDCT) scan.

OBJECTIVE
To evaluate the frequency of hepatocellular carcinoma related to hepatitis C on multidetector computed tomography.

METHODOLOGY
A cross sectional analytical study was conducted at Shalimar Hospital Lahore. It included 195 patients suffering from Hepatitis C Convenient sampling method was used. The inclusion criteria were adults with hepatitis c or had history of hepatitis c. The exclusion criteria were pregnant women, patients who had an allergic reaction to contrast medium, patients who had undergone a nuclear medicine procedure in the past. The presence of HCC was confirmed using a 64 slice CT scanner. Triassic contrast enhanced imaging was done. Images were interpreted by a senior radiologist. Frequency was calculated and crosstabs were made using SPSS version 21.0.

RESULTS
Among 195 patients, frequency of Hepatocellular Carcinoma (HCC) was 63 (32.3 %) which was more common in male as compared to female. In male its occurrence was 130 (66.7 %) while in female 65 (33.3 %). Frequency of various risk factors and clinical features were as follows: alcohol consumption 3(1.5 %), cirrhosis 52 (26.7) %, obesity 55 (28.2 %), diabetes 65 (33.3 %), jaundice 110 (56.4 %), dark colored urine 127 (65.1 %), nausea and vomiting 114 (58.5 %), weakness 118 (60.5 %) and bloating 41 (21 %).

CONCLUSION
The study concluded that frequency of HCC in patients with HCV was 32.3 % and was more common in males as compared to the females.

KEYWORDS
Hepato Cellular Carcinoma (HCC), Multi - Detector Computed Tomography (MDCT), Hepatitis C (HCV)

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INTRODUCTION

Hepatitis is a Latin word, which means "liver inflammation". Hepatitis C is a well - known liver disease that affects people all over the world. It is caused by the Hepatitis C Virus (HCV), and a significant number of persons who are infected progress to chronic hepatitis, hepatocellular carcinoma, and liver cancer.[1] Acute and chronic hepatitis, as well as liver cirrhosis and cancer, can be caused by the virus which can range in severity from a mild disease to a serious life threatening illness. HCV infections are usually asymptomatic and seldom result in a life - threatening illness. Within six months of infection, over 30 % (15 – 45 %) of infected people naturally eliminate the virus without any therapy. Chronic HCV infection will occur in the remaining 70 % (55 – 85 %) of people. Cirrhosis is a danger for patients with persistent HCV infection that ranges from 15 % to 30 % within 20 years.[2] Hepatitis C virus is the second most prevalent cause of hepatocellular carcinoma in the globe. People with chronic HCV are at greater risk to developed HCC than people who aren't infected. Furthermore, HIV is another risk factor for HCC. Approximately 80 % of HIV - positive patients contracts the hepatitis C virus, which causes chronic HCV and, in turn, increased infection - causing HCC.[3] Cancer is a group of lethal diseases that, if left untreated, will become uncontrollable. Liver cancer is the world's most recurrent cancer cause leading to mortality. Hepatocellular Carcinoma (HCC) accounts for over 90 % of all serious liver malignancies, generating substantial health consequences around the world.[4] As people get older, the likelihood of developing HCC increases. HCC has a high masculine dominance it affects more men than women. Male to female ratio is expected to be 2 - 2. 5: 1. HCC is the fifth most frequent cancer in men in the world, and the seventh most prevalent cancer in women.[5] HCC has been connected to cirrhosis caused by HBV, HCV, and HDV infection in a number of cases. HCC can also be caused by differences in age, sex, obesity, diabetes, smoking, excessive alcohol consumption, and afflation exposure.[6] HCC has a complex clinical appearance because it is difficult to diagnose in the early stages it usually occurs silently. This is due to the liver's location, which is deep beneath the lower rib. It also depends on the tumor's size a specific tumors size will aid in the diagnosis of HCC before it spreads to nearby organs or tissues. Furthermore, until the tumor has progressed to the late stages, there are no indications or symptoms that may be used to diagnose HCC. As a result, the clinical picture changes, the patient may be asymptomatic, with no symptoms other than cirrhosis. Patients may have a decrease of appetite, weight loss, or palpable lumps in the upper abdomen in some circumstances. These are the signs and symptoms of liver lesions that have progressed.[7] HCC can be diagnosed non - invasively using ultrasonography, computed tomography, and Magnetic Resonance Imaging (MRI). Furthermore, MDCT has a critical role to play in diagnosing HCC in patients undergoing liver transplantation and has a high sensitivity. Imaging is necessary to prevent the extent of disease from being exaggerated. MDCT, which is primarily crucial for the patient's treatment, is also one of the most reliable procedures for diagnosing HCC.[8] MDCT technology has become commonplace in clinical practice in recent years. MDCT, on the other hand, scans using a bank of continuous detectors and 64 slices without sacrificing exceptional resolution. Single detector CT can be used for scanning, but it takes around 20 seconds to complete a scan of the liver, whereas multidetector CT scans faster, resulting in more accurate and uniform hepatic enhancement during each phase of acquisition imaging.[9] the purpose of this study is to assess the detection of hepatocellular carcinoma due to hepatitis c on MDCT. In our study we will find that how many of population develops HCC who were previously and currently affected by hepatitis c virus.

MATERIALS AND METHODS

It was a cross sectional study performed to find out the frequency of hepatocellular carcinoma in hepatitis C patients. It included 195 patients suffering from hepatitis C, of both genders male and female along with convenient sampling technique. The duration of data collection was 6 months and data were collected from Radiology department of Shalimar Hospital Lahore. The inclusion criteria was adults with hepatitis c or had history of hepatitis cite exclusion criteria was pregnant women, patients who had an allergic reaction to contrast medium, patients who had undergone a nuclear medicine procedure in the past. The presence of HCC was confirmed using a 64 slice CT scanner. Triassic contrast enhanced imaging was done. Images were interpreted by a senior radiologist. Frequency was calculated and crosstabs were made using SPSS version 21.0 (Figures 1 and 2).

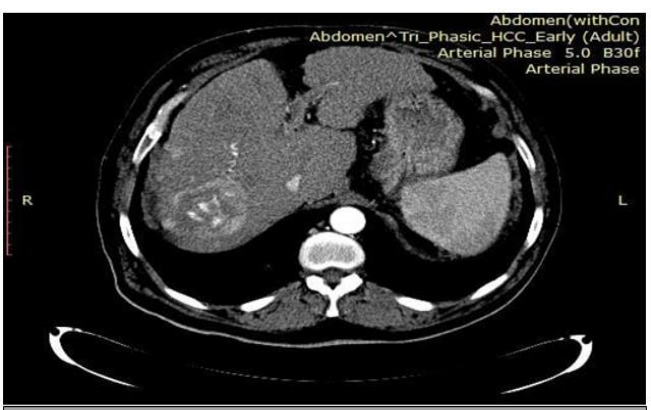

Figure 1. Axial Image of CT scans Showing Hcc In Right Lobe of Liver.

Figure 2. Axial image of CT scan showing HCC in right and left both lobes of liver.

RESULTS

In this study 195 patients suffering from hepatitis C visited the radiology department for CT - Triassic scan. The number of males was 130 (66.7 %) and females were 65 (33.3 %). Out of 195 patients, 3 (1.5 %) were alcoholics, 52 (26.7 %) were suffering from cirrhosis, 55 (28.2 %) were obese, 65 (33.3 %) were diabetic, 110 (56.4 %) were suffering from jaundice, 127 (65.1 %) had dark colored urine, 118 (60.5 %), were weakened, 41 (21 %) were having bloating, 114 (58.5 %) were having and 63 (32.3 %) patients were diagnosed with HCC. The occurrence of HCC was higher in males than females (Tables 1-7).

Variables	Categories	Frequency(Percentage)
Gender	Male	130 (66.7 %)
	Female	65 (33.3 %)
HCC	Yes	63 (32.3 %)
	No	132 (67.6 %)
Alcoholic	Yes	3 (1.5 %)
	No	192 (98.5 %)
Cirrhosis	Yes	52 (26.7 %)
	No	143 (73.3 %)
Obesity	Yes	55 (28.2 %)
	No	140 (71.8 %)
Diabetes	Yes	65 (33.3 %)
	No	130 (66.7 %)
Jaundice	Yes	110 (56.4 %)
	No	85 (43.6 %)
Nausea and vomiting	Yes	114 (58.5 %)
	No	81 (41.5 %)
Dark colored urine	Yes	127 (65.1 %)
	No	68 (34.9 %)
Bloating	Yes	41 (21 %)
	No	154 (79 %)

Table 1. Shows Variables and Their Frequencies.

Table 2 shows the cross tabulation of gender and HCC. It shows that out of 195 patients 130 (66.7 %) were males and 65 (33.3 %) were females. Out of 65 (33.3 %) females, 18 (27.7 %) females were having HCC and out of 130 (66.7 %) males. 45 (34.6 %) males were having HCC.

			HCC		Total
Gender			No	Yes	
Gender	Female	Count	47	18	65
		% within Gender	72.30 %	27.70 %	100.00 %
	Male	Count	85	45	130
		% within Gender	65.40 %	34.60 %	100.00 %
Total		Count	132	63	195
		% within Gender	67.70 %	32.30 %	100.00 %

Table 2. Gender* HCC Cross Tabulation.

Table 3 describes the cross tabulation of Alcohol and HCC, it describes that out of 195 patients 132 (67.6 %) patients were not having both Alcohol and HCC while 60 (31.2 %) patients were having HCC but not Alcohol. However 3 (1.5 %) patients were having HCC and alcohol both.

			HCC		Total
Alcoholic			**No**	**Yes**	
Gender	Female	Count	132	60	192
		% within Alcoholic	67.60 %	31.20 %	100.00 %
	Male	Count	0	3	3
		% within Alcoholic	0.00 %	100.00 %	100.00 %
Total		Count	132	63	195
		% within Alcoholic	67.60 %	32.40 %	100.00 %

Table 3. Alcoholic* HCC Cross Tabulation.

Table 4 describes the cross tabulation of HCC and obesity, it describes that out of 195 patients,111 (79.3 %) patients were not having HCC and obesity, while 29 (20.7 %) patients had HCC but they were not obese. However, 34 (61.8 %) patients had both HCC and obesity, and 21 (38.2 %) patients had obesity but not HCC.

			HCC		Total
Obesity			**No**	**Yes**	
Gender	Female	Count	111	29	140
		% within Obesity	79.30 %	20.70 %	100.00 %
	Male	Count	21	34	55
		% within Obesity	38.20 %	61.80 %	100.00 %
Total		Count	132	63	195
		% within Obesity	67.70 %	32.30 %	100.00 %

Table 4. Obesity* HCC Cross Tabulation.

Table 5 describes the cross tabulation of Diabetes and HCC, it describes that out of 195 patients 101 (77.7 %) patients had not HCC as well as Diabetes while 29(22.3 %) patients had HCC but not Diabetes. However, 31 (47.7 %) patients had not HCC but they had diabetes and 34 (52.3

%) patients had both HCC and Diabetes.

			HCC		Total
Diabetes			No	Yes	
Gender	Female	Count	101	29	130
		% within Diabetes	77.70 %	22.30 %	100.00 %
	Male	Count	31	34	65
		% within Diabetes	47.70 %	52.30 %	100.00 %
Total		Count	132	63	195
		% within Diabetes	67.70 %	32.30 %	100.00 %

Table 5. Diabetes* HCC Cross Tabulation.

Table 6 Describes the cross tabulation of HCC and Dark colored urine. Out of 195 patients, 73 (57.5 %) patient had not HCC but Dark colored urine, while 9 patients (13.2 %) were having HCC but not Dark colored urine. However, 59 (86.8 %) patients were not having Dark colored and HCC both and 54 patients (42.5 %) were having both dark colored urine and HCC both.

			HCC		Total
Dark - Colored Urine			No	Yes	
Gender	Female	Count	59	9	68
		% within Dark - colored urine	86.80 %	13.20 %	100.00 %
	Male	Count	73	54	127
		% within Dark - colored urine	57.50 %	42.50 %	100.00 %
Total		Count	132	63	195
		% within Dark - colored urine	67.70 %	32.30 %	100.00 %

Table 6. Dark - Colored Urine * HCC Cross Tabulation.

Table 7 describes the cross tabulation of HCC and cirrhosis. Out of 195 patients, 10 (27.3 %) patient had not HCC but cirrhosis, while 22 patients (11.2 %) were having HCC but not cirrhosis. However, 80 (41 %) patients were not having cirrhosis and HCC and 40 (20.5) patients were having both HCC and cirrhosis.

			HCC		Total
			No	Yes	
Cirrhosis	No	Count	122	21	143
		% within Cirrhosis	85.30 %	14.70 %	100.00 %
	Yes	Count	10	42	52
		% within Cirrhosis	19.20 %	80.80 %	100.00 %
Total		Count	132	63	195
		% within Cirrhosis	67.70 %	32.30 %	100.00 %

Table 7. Cirrhosis* HCC Cross Tabulation.

DISCUSSION

Globally, HCC in males is the third most common while the fifth most common cancer in females.[10,11] our study shows that Hepato Cellular Carcinoma (HCC) is more common in males as compared to females. Moreover, the study describes that out of 62 patients 40 (64.5 %) is common in males as compared to females. According to the study, the overall occurrence of HCV associated with HCC is high.[12,13] Our study shows that patients with HCV have a high prevalence of HCC. Out of 195 patients with HCV, 62 (31.7 %) patients were suffering from HCC. However, this manifests that the incidence or prevalence of HCC is more when it is related to HCV. Obstructive jaundice as the main clinical feature is uncommon in patients with hepatocellular carcinoma (HCC). Only 1 % - 12 % of HCC patients manifest obstructive jaundice as the initial complaint. In diffuse tumor invasion of the liver parenchyma or progressive liver failure obstructive jaundice can occur. Intraductal tumor growth may occur in the common hepatic duct and / or common bile duct causing obstructive jaundice. Moreover, in our study, we found that the prevalence rate of jaundice (yellow discoloration of the skin and eyes) among the 195 patients was 110 (56.4 %). High consumption of alcohol is often the prevalent cause of HCC. Alcohol generally contributed to 15 % to 45 % of HCC cases in developed countries. Many studies have shown the association between heavy alcohol intake and HCC. Men tend to consume more alcohol than women that's why men are at greater risk. In our study we found that among 195 patients, 3 (1.5 %) were alcoholic. So the significant alcohol intake was uncommon. Studies have shown that obesity is a risk factor for HCC. A study indicated that the chance of HCC is more in obese people (with body mass index greater than 30) than the general population.[14] Moreover our study shows that 55 (28.2 %) patients out of 195 were obese. Some studies indicated that the occurrence of HCC in persons with type 2 diabetes mellitus than in non - diabetic persons is double. Non - alcoholic fatty liver disease is linked with obesity and type 2 diabetes mellitus, and is a possible risk factor for HCC.[15] In our study we found that out of total of 195 patients, only 65 (33.3 %) were diabetic. Generalized weakness is common in cancer patients. The causes of these symptoms can be multiple. There will be a high prevalence of malnutrition in patients with advanced malignancy.[16-18] Our study shows that out of 195 patients, 118 (60.5 %) patients had a weakness. Suspected HCC patients should be evaluated using multiphasic contrast - enhanced CT imaging of the liver. This followed by rapid intravenous infusion of contrast media, at various time intervals corresponding to the phase of contrast enhancement imaging. Triassic scanning shows hepatic imaging performed before contrast, during arterial and venous phases. HCC tumors get blood supply predominantly from the hepatic artery and tend to enhance during the arterial phase or 2 – 40 seconds after contrast infusion. The surrounding hepatic parenchyma obtains 75 – 80 % of its blood flow through the portal vein and is best demonstrated 50 – 90 seconds after infusion of contrast during the portal phase. Arterial phase enhancement can increase HCC tumor detection by 10 %. Multidetector Computed Tomography (MDCT) allows high - quality, thin - section imaging with three - dimensional capabilities due to its added speed and flexibility. Moreover, in our study all patients showed arterial enhancement during the arterial phase and rapid washout during a portal venous phase.

CONCLUSION

The study concluded that frequency of HCC in patients with HCV was 32.3 % and was more common in males as compared to the females.

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