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Original Article

Frequency of Acute and Chronic Liver Diseases Diagnosed on Computed Tomography

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ABSTRACT

Liver pathologies are affecting millions of people worldwide due to increasing risk factors and an unhealthy environment. Early diagnosis is essential to aid the treatment process and declined the mortality rate. **Objective:** To evaluate the frequency of acute and chronic hepatic diseases using multidetector Computed Tomography. **Methods:** The study was conducted in a private healthcare institute, with a sample size of 49 patients including 25 females and 24 males. Data were calculated by taking the mean via a convenient sampling approach, after informed consent. All the patients diagnosed with various liver diseases during the CT scan investigation presented at the study area within the period of study were included. Data was entered and analyzed by using SPSS version 20. **Results:** According to the current study, the patients from 46 -65 years 28(57.1%) had the highest frequency, and the females 25(51.0%) were more likely to develop liver diseases than males 24(49.0%). The frequency of chronic liver diseases includes cirrhotic patients 17(34.7%), liver masses 30(61.2%), calcified granuloma 2(4.1%), fatty infiltration 4(8.2%), and cysts 3(6.1%). Most of the patients having cirrhosis were also associated with liver masses 20(40.8%). **Conclusions:** In conclusion, CT is a quick, non-invasive, and reliable diagnostic imaging for detecting different liver pathologies, provides exceptional image quality and provides high contrast to diagnose liver abnormalities.

INTRODUCTION

The liver is the largest gland lying in the upper right quadrant of the human body which helps in the production of exudate bile, bilirubin, cholesterol, hormones, and drugs [1,2]. It activates enzymes and stores glycogen, vitamins, and minerals [3]. Moreover, it metabolizes carbohydrates, fats, and proteins [4]. The structure and functions of the liver are affected with advancing age and by increasing risk factors [5]. Liver pathologies are affecting millions of people worldwide [6]. To prevent the spread out of hepatic diseases and overcome the death rate of liver failure it is essential to diagnose efficiently as a prime concern and treat promptly [7,8]. There are various kinds of hepatic diseases but the most common diseases are cirrhosis, polycystic liver disease, fatty liver disease, hepatocellular carcinoma, hepatomegaly (enlarged liver), liver abscess, and hepatic hemangiomas [9,10]. Hepatitis B and C, fatty liver disease, and alcohol consumption causes liver cirrhosis in which the smooth and lobulated parenchyma of the liver changes into a hard and scarring surface [11]. Cirrhosis affects liver function and develops many complexities like multiple nodules and portal hypertension, ascites, and variceal hemorrhage [12]. Fatty liver disease is the excessive intracellular deposition of lipid within hepatocytes that can be alcoholic fatty liver (AFLD) and Non-alcoholic fatty liver disease (NAFLD) [13]. AFLD is caused by taking too much alcohol, hepatitis C, and obesity. NAFLD is common in patients having type 2 diabetes, obesity, high level of cholesterol and triglycerides in the

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blood, high blood pressure, taking certain drugs such as corticosteroids and some cancer drugs, having certain metabolic disorders, malnutrition, having certain infections such as hepatitis C and toxins (e.g., carbon tetrachloride) are potential causes [14,15]. Symptoms are hepatomegaly, jaundice, abdominal pain, weakness, nausea, loss of appetite, weight loss, feeling the fullness of the right upper side of the abdomen, swollen abdomen, or legs (edema), and mental confusion [16]. Polycystic liver disease is an uncommon disease that causes the growth of fluid-filled sacs in various parts of the liver [17]. The smooth and uniform surface of the liver looks like a bunch of grapes [18]. On the other hand, liver abscesses are pus-filled mass that is caused by the infection in the blood and bile ducts, appendicitis, or diverticulitis [19]. Types of liver abscesses are a pyogenic abscess (due to Polymicrobial infection), amebic abscess (due to Entamoeba histolytica), and fungal abscess (due to Candida species) [20]. Hepatic hemangiomas are congenital and the most common benign (non-cancerous) tumor in the liver formed by the clumping of the blood-filled cavities supplied by the hepatic artery [21]. They are asymptomatic, therefore, diagnosed unintentionally [22]. Hepatocellular carcinoma (HCC) is a primary, malignant, and life-threatening tumor that progresses slowly [23]. HCC is mostly caused by cirrhosis and nonalcoholic fatty liver disease [24]. Other risk factors include hepatitis B and hepatitis C, excessive alcohol intake, diabetes, and obesity [25]. Liver metastases are secondary and malignant tumors that metastasize from the liver to other parts of the body i.e. Breast, colon, rectum, kidney, esophagus, lung, kidney, skin ovaries, uterus, pancreas, and stomach [26]. These hepatic diseases are initially diagnosed on ultrasonography because it is safe, widely available, well-tolerated, and inexpensive but it has some limitations, such as a small field of view, limited use in chronic liver disease, inability to detect the extent of fibrosis, cirrhosis, and NASH, operator and equipment dependence, limited use in obese patients and low sensitivity for diagnosing grade 1 hepatosteatosis [27]. CT is a quick, non-invasive, and reliable diagnostic imaging for detecting different liver pathologies [28]. Due to the intricacy of liver shape, volume, and dimensions, the triphasic CT technique is the best approach to be operated for the measurement of various hepatic diseases [29]. Each individual is suffering from hepatic disease due to increasing risk factors and an unhygienic lifestyle. It is essential to diagnose initially on ultrasonography when any symptom is indicated but some diseases are not evaluated on ultrasound. The current study shows the evaluation of hepatic diseases on multidetector Computed Tomography. CT is highly sensitive in diagnosing hepatic diseases and provides exceptional images quality and provide high contrast to diagnose liver abnormalities.

METHODS

A cross-sectional study was conducted over four months. Data was collected from the private healthcare institute of Gujranwala after informed consent. The sample size of 49 patients was calculated by taking the mean of previous related studies via a convenient approach [2,10,30]. All the patients diagnosed with various liver diseases during the CT scan investigation presented at the study area within the period of study were included. The demographic history of patients was also calculated. The data were entered and analyzed by SPSS version 20.

RESULTS

In this study, 49 patients of various age groups were examined who were suspected to have hepatic disease using CT in the private healthcare institute. Table 1 shows the distribution of patients' age groups. The first group includes patients 11(22.4%) ranging in age from 25-45 years. The second group includes 28(57.1%) patients aged 46-65 years and the third group includes 10(20.4%) patients aged 66-85 years. The patients from 46 -65 years 28(57.1%) have the highest frequency. The finding showed that out of 49 subjects, 25(51.0%) were females and 24(49.0%) were males (Table 2).

Age of patients		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25-45	11	22.4	22.4	22.4
	46-65	28	57.1	57.1	79.6
	66-85	10	20.4	20.4	100.0
	Total	49	100.0	100.0	

Table 1: Distribution of Age Groups

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Females	25	51.0	51.0	51.0
	Male	24	49.0	49.0	100.0
	Total	49	100.0	100.0	

Table 2: Distribution of Gender

The distribution of acute and chronic hepatic diseases was shown in Table 3. The frequency of cirrhotic patients is 17(34.7%). The frequency of liver masses is 30(61.2%). The frequency of calcified granuloma is 2(4.1%). The frequency of fatty infiltration is 4(8.2%). The frequency of cirrhosis and liver masses is 20(40.8%) and the frequency of liver cysts is 3(6.1%). Most of the patients having cirrhosis are also associated with liver masses 20(40.8%) diagnosed on Computed tomography.

Findings	Variables	Frequency	Percent
Cirrhosis	Yes	17	34.7
	No	32	65.3
	Total	49	100.0
Liver Masses	Yes	30	61.2
	No	19	38.8
	Total	49	100.0

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Calcified Granuloma	Yes	2	4.1
	No	47	95.9
	Total	49	100.0
Fatty Infiltration	Yes	4	8.2
	No	45	91.8
	Total	49	100.0
Cirrhosis and Liver Masses	Yes	20	40.8
	No	29	59.2
	Total	49	100.0
Liver cyst	Yes	3	6.1
	No	46	93.9
	Total	49	100.0

Table 3: Distribution of Hepatic Diseases

DISCUSSION

Liver pathologies are affecting millions of people worldwide. There are various kinds of hepatic diseases but the most common diseases are cirrhosis, polycystic liver disease, fatty liver disease, hepatocellular carcinoma, hepatomegaly, liver abscess, and hepatic hemangiomas.

In the current study, 49 patients were examined on CT who were expected to have liver disease. The patients taken in this study were between the age of 25 to 85 years including 25(51.0%) females and 24(49.0%) males. The patients between the age of 46 to 65 28(57.1%) and females as compared to males have the highest frequency of acute and chronic liver diseases. A previous study found similar results by Tagred Mohamed Al Khair in 2018 [30]. Different liver diseases were diagnosed in 51 patients in the age group of 30 to 86 years which depicts that the patients with a mean age of 54 years were more affected by the different liver diseases. Liver volume, dimensions, and physiology were affected due to various acute and chronic liver diseases. A study by Amel Ahmed Ali Mohammed in 2019 also concluded that the size, shape, appearance, and functions of the liver changed significantly with different liver diseases [10]. According to the current study, 17(34.7%) patients out of 49 were diagnosed with Liver Cirrhosis and 30(61.2%) patients were diagnosed with Liver Masses. The patients with Calcified Granuloma are 2(4.1%) and the patients with Fatty Infiltration are 4(8.2%). The diagnosis of Liver Cyst patients is 3(6.1%) and the patients diagnosed with cirrhosis also associated with liver masses were 20(40.8%). The current study revealed that liver masses have the highest frequency of other diseases and some patients having cirrhosis were also diagnosed with liver masses. The frequency of calcified granuloma and liver cyst has the lowest frequency. The frequency of Fatty Infiltration on CT is also less. A previous study by Ahmed published in 2019 also had a similar result that the frequency of liver masses is highest than in other liver diseases[2].

CONCLUSIONS

The current study findings proved that CT is the best modality for the diagnosis and follow-up of various liver diseases as it provides detailed information about the morphological changes of the liver. The common typical liver diseases were cirrhosis, masses, fatty infiltration, liver cyst, and calcified granuloma, and a link was also noticed between cirrhosis and liver masses in some patients. The liver masses have the highest frequency and calcified granuloma has the lowest frequency as compared to other hepatic diseases.

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