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Evaluation of Hepatocellular Carcinoma Using Computed Tomography

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Abstract
Background: Focal liver lesions are identifiable as any abnormality within the liver that deviates from the normal liver tissue (parenchyma), regardless of whether they cause structural or functional changes in the hepatobiliary system. These lesions vary in size and can be either benign or malignant. Objective: The objective of this study was to evaluate liver lesions using triphasic Computed Tomography Scan. Materials & Methods: A total of 45 subjects from Lahore who were visited at radiology department FMH between July 2015 to December 2015 for the evaluation of liver lesion using triphasic computed tomography scan. Results: The study was conducted on 45 subjects for the evaluation of liver lesions using computed tomography triphasic scan. The mean age of subjects was age of patients ranged from 23 to 80 years with a mean of 57.53±11.603 and out of 45 subjects the frequency of males was 29(64.4%) and the frequency of females was 16(35.6%). Out of 45 patients 9(20%) had Hemangioma and 36(80%) had HCC. Out of 45 patients 41 had ultrasound finding mass ,21 was HCV positive, 35 had chronic liver disease (CLD) Conclusion: Triphasic Computed Tomography scan is a good modality to differentiate between benign and malignant liver lesions. It helps to avoid unnecessary biopsy.

Keywords: *Hepatocellular carcinoma, Chronic Liver Disease, Computed Tomography.*

Introduction

The liver is the vital organ. Liver has wide range of functions which include metabolism of different metabolites through detoxification and protein synthesis. It is also involved in the production of different biochemical which play an important part in the digestion of food. It is also responsible for storage of glycogen, plasma protein synthesis, bile production and the breakdown of pharmaceutical products. The term “lesion” has originated from “Lesion” which means injury. A liver lesion denotes an area of tissue damage within the liver, the importance of which varies based on the patient's overall health and numerous other factors. Focal liver lesions, in particular, are identified as any abnormalities in the liver that differ from the standard liver tissue (parenchyma), potentially leading to structural and functional changes. These lesions primarily fall into two categories: benign and malignant.[1,2]

"Hepatocellular carcinoma (HCC) represents the primary form of liver cancer, most commonly arising in individuals with chronic liver disease and cirrhosis. The likely cells of origin for this malignancy are hepatic stem cells. HCC tends to grow locally, spread within the liver, and eventually metastasize distantly, making it the third leading cause of cancer-related deaths[3].

The highest rates of hepatocellular carcinoma are seen in Asia and Africa. This is largely attributed to the widespread incidence of hepatitis B and C in these regions, which significantly increases the risk of chronic liver disease and, consequently, HCC. Over recent decades, the presentation of hepatocellular carcinoma has notably changed. Previously, HCC typically manifested in advanced stages, characterized by symptoms such as right upper quadrant pain, weight loss, and signs of advanced liver disease[4]. However, current

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practices in the medical field have allowed for earlier detection of HCC. This shift is largely due to the routine monitoring of patients with known cirrhosis, employing techniques like cross-sectional imaging studies and serum alpha-fetoprotein testing. As a result, HCC is now often identified at earlier stages, allowing for more timely intervention[5]

Literature Review

F H Miller, R S Butler, conducted a study Using Triphasic helical CT to detect focal hepatic lesions in patients with neoplasm in 1998. The objective of the study was "to determine value of Triphasic spiral CT in the detection and characterization of hepatic liver lesions."[6] The sample size of this study was 102, having known or suspected liver cancer. In a study involving 102 patients, a total of 584 lesions were identified. The findings suggested that malignancies with reduced vascularity are most effectively assessed during the portal venous phase. Conversely, small lesions, which are often a result of hypervascular metastases or hematomas, are optimally evaluated and sometimes only detectable in the hepatic arterial phase. Therefore, this phase should be routinely used in these cases. However, the heightened sensitivity of the hepatic arterial phase in detecting lesions presents new challenges[7,8]. (Hoff, Miller, & Butler, 1998) The aim of this study is to assess liver lesions using a triphasic Computed Tomography (CT) scan[9].

Materials & Methods

This study was conducted at Fatima memorial Hospital in radiology department. A total Forty-five subjects, who fulfilled the criteria, with liver lesions were involved in the study. Out of forty-five patients 29 were male and 16 were female as shown below:

Table 1. Frequency distribution of gender

Gender	Frequency	Percentage
Male	29	64.4
Female	16	35.6
Total	45	100

The mean age of patients ranged from 23 to 80 with a mean of 57.53±11.603 years

Table 2. Descriptive statistics

No. of patient	Mean	St. deviation	Minimum	Maximum
45	57.53	11.603	23	80

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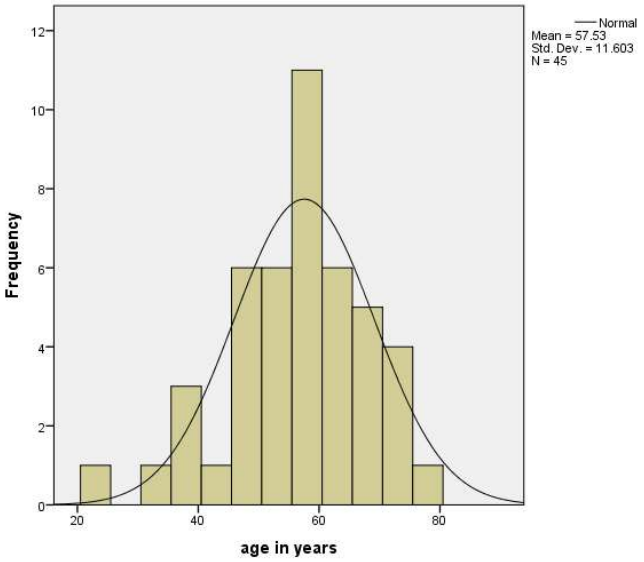

Out of forty-five patients, 46.7% were diagnosed with HCV and 53.3% were free of disease.

Table 3. HCV

HCV	Frequency	Percentage
Positive	21	46.7
Negative	24	53.3
Total	45	100

Out of forty-five patients, 91.1% had abdominal mass and 8.9% were free of disease.

Table 4. Abdominal mass

Abdominal Mass	Frequency	Percentage
Present	41	91.1
Absent	04	8.9
Total	45	100

Out of forty-five patients, 48.9% had Ascites and 51.1% were free of disease.

Table 5. Ascites

Ascites	Frequency	Percentage
Present	22	48.9
Absent	23	51.1
Total	45	100

Out of forty-five patients, 77.8% had cirrhosis and 22.2% were free of disease.

Table 6. Cirrhosis

Cirrhosis	Frequency	Percentage

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Present	35	77.8
Absent	10	22.2
Total	45	100

Out of forty-five patients, 53.3% had Splenomegaly and 46.7% were free of disease.

Table 7. Splenomegaly

Splenomegaly	Frequency	Percentage
Present	24	53.3
Absent	21	46.7
Total	45	100

Out of forty-five patients, 86.7% had CLD and 13.3% were free of disease.

Table 8. Chronic liver disease

CLD	Frequency	Percentage
Present	39	86.7
Absent	06	13.3
Total	45	100

Out of forty-five patients, 20% had hemangioma and 80% had Hepatocellular Carcinoma.

Table 9. Hemangioma

Hemangioma	Frequency	Percentage
Present	09	20
Absent	36	80
Total	45	100

Out of forty-five patients, 80% had hepatocellular carcinoma and 20% had HCC.

Table 10. HCC

HCC	Frequency	Percentage
Present	36	80
Absent	09	20
Total	45	100

Results and Discussion

In this study, forty-five individuals were examined using triphasic Computed Tomography scan to determine the liver lesions. Out of forty-five individuals 09 were found benign disease and 36 were diagnosed with malignant liver lesions. Triphasic Computed Tomography scan is helpful in detecting the liver lesions revealed that 80% of subjects were suffering from malignant HCC while 20% were suffering from benign Hemangioma. Out of 45 individuals, 91.1% had abdominal mass, 46.7% were HCV positive, 48.9% had ascities, 77.8% had cirrhosis, 86.7% had CLD, 53.3% had Splenomegaly.

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Saima Hafeez, Muhammad Shahbaz Alam, Zafar Sajjad, and Waseem Akhtar conducted a prospective study utilizing triphasic computed tomography to evaluate liver lesions. Within a cohort of 45 patients, 37 (82.2%) were diagnosed with Hepatocellular Carcinoma (HCC), and 8 (17.8%) with Hemangioma. The most frequent clinical manifestation observed was jaundice in 32% of patients, followed by pain and fever in 15%. The average age of the patients was 46.5 years with a standard deviation of 13.4 years. The mean size of the lesions was 3.4 cm with a standard deviation of 2.6 cm, and they ranged in size from 0.9 to 13 cm. Therefore, the findings of this study provide supporting evidence for my research.

Conclusion

The triphasic CT scan serves as an effective tool for distinguishing between benign and malignant liver lesions. It allows for the differentiation of benign lesions, such as Hemangioma, from malignant ones like HCC (Hepatocellular Carcinoma), thereby reducing the need for unnecessary biopsies. Early screening, facilitated by this method, enables prompt diagnosis, which is crucial for improving survival rates. Currently, screening for HCC is advised for certain groups of patients with chronic liver disease, including those with chronic hepatitis C. Over the past two decades, imaging technology has seen significant advancements, and modern techniques, including CT scans, are now adept at identifying liver lesions like HCC.

Limitation

Study should be conducted in multiple centres.
•Sample size should be large.
•Patient with high creatinine level
•Costly imaging

References

1. Assy, N., Nasser, G., & Elias, S. (2009). *recommendations for diagnostic workup* , 3217 to 3227.
2. Bowen, R. (1997, 5 11). *histology of liver*. www.vivo.colostate.edu:
3. Cicalese, L. (2015, 9 28). *HCC liver*. Retrieved from http://emedicine.medscape-.com/article/197319-overview
4. Gest, T. R. (2015, 9 9). *blood supply of liver*. http://emedicine.medscape.com/article-/1900159-
5. GF, G., & E, C. (1998). evaluation of liver lesion using triphasic ct scan.
6. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3878741/
7. Hafeez, S. (2011, 6). *role of triphasic ctscan for HCC*.
8. http://ecommons.aku.edu/cgi/viewcontent.cgi?article=1021&context=pakistan_fhs_mc_radiol
9. Hafeez, S., Alam, M. S., & Akhtar, W. (2011, june). triphasic ct scan in focal liver lesions. *Journal of pakistan medical association* , 61 to 571.
10. Harris, T. (2015). *ct scan*. Retrieved from science.howstuffworks.com:
11. Snell, R. S. (2012). *clinical anatomy.* united state of America: Lippincott Williams & Wilkins.
12. Taylor, T. (2015). *physiology of liver*. Retrieved from www.innerbody.com: http://www.innerbody.com/image_digeov/card10-new2.html#full-description
13. Wolf, D. D. (2014, 11 10). *liver hemangioma*. Retrieved from emedicine.medscape.com: http://emedicine.medscape.com/article/177106-overview