Original Article

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Evaluation of Hepatic Masses Using CT Scan

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Abstract

Background: The aim is to evaluate hepatic masses using CT scan on 68 adult patients. **Subjects and Methods:** Sixty- eight adult patients in age ranged 25- 65 years of either gender were selected for this study having hepatic masses. CT images were taken using Siemens 3^{rd} generation spiral CT scan machine. Lesions were mentioned as hyper enhancement, hypo enhancement, iso-dense and mixed enhancement pattern. All the images were studied by single expert radiologist. **Results:** Out of 68 patients, age group 25- 35 years had 12 male and 7 female, 35- 45 years had 15 male and 11 female, 45- 55 years had 7 male and 6 female and 55-65 years had 6 male and 4 female. Common hepatic masses were liver abscess in 32%, hemangiomas in 5%, focal nodular hyperplasia in 15%, cholangio carcinoma in 4%, metastasis in 6%, simple cysts in 20%, hepatocellular carcinoma in 6 and hydatid cysts in 12%. Sensitivity of CT in detecting hepatic masses found to be100%, specificity 92.2%, positive predictive value (PPV) 96.5% and negative predictive value (NPV) 100%. **Conclusion:** CT has high diagnostic value in diagnosing cases of hepatic masses.

Keywords: CT Scan, Hepatic Masses, Hemangiomas, Sensitivity.

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Introduction

Hepatic masses are common in middle aged. History and clinical examination may be useful in assessment of lesions.[1] However, the diagnosis of hepatic masses is not easy task. It creates lots of confusion and controversy.[2] For the reliable and correct evaluation, various imaging modalities such as magnetic resonance imaging, CT scan etc. are used.[3] The main aim of any modality is to diagnose benign as well as malignant lesions. All modalities offer few advantaged and disadvantages. Few lesions may be diagnosed by all and at the same time, other imaging may miss them.[4] Apart from it, the role of laboratory findings may not be overlooked. Precise characterization of liver masses by imaging is chiefly dependent on an understanding of the unique phasic vascular perfusion of the liver and the characteristic behaviors of different lesions during multiphasic contrast imaging.[5]

A liver biopsy become essential for final diagnosis when non-invasive characterization is indeterminate.[6] At the same time, histologic examination as well as immunohistochemical assessment of protein biomarkers play important role. Correct diagnosis of hepatic lesions is of paramount importance for the selection of better treatment option.[7] The staging of tumour, functional status of the uninvolved liver etc. are few parameters that determine management of malignant masses or those who poses high.[8] We selected present study to evaluate hepatic masses using CT scan on 68 adult patients.

Subjects and Methods

Sixty- eight adult patients in age ranged 25- 65 years of either gender were selected for this study. Higher authorities were approach for obtaining ethical clearance and those were agreed to participate were included with their written consent.

All relevant information of patient was recorded. Careful history and clinical examination was conducted among all. The procedure for obtaining CT scan was explained to all. CT images were taken using Siemens 3^{rd} generation spiral CT scan machine. We obtain a Triphasic liver CT scan. Serial CT slices was taken at an interval of 5 mm. Lesions were mentioned as hyper enhancement, hypo enhancement, iso-dense and mixed enhancement pattern. All the images were studied by single expert radiologist. Data was compiled and were entered in MS excel sheet where the test applied was Kruskal Wallis. P value less than 0.05 was considered significant.

Results

Table 1: Cases distribution as per age and sex

Age group (years)	Males	Females	P value
25-35	12	7	>0.05
35-45	15	11	
45-55	7	6	
55-65	6	4	

Out of 68 patients, age group 25- 35 years had 12 male and 7 female, 35- 45 years had 15 male and 11 female, 45- 55 years had 7 male and 6 female and 55-65 years had 6 male and 4 female. A non- significant difference was seen among male and female (P> 0.05) [Table 1, Figure 1].

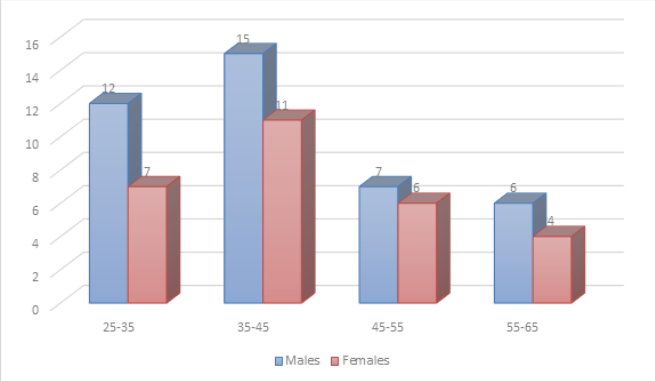


Table 2: Type of hepatic lesions

Hepatic lesions	Percentage	P value
Liver abscess	32%	<0.05
Hemangiomas	5%	
Focal nodular hyperplasia	15%	
Cholangio carcinoma	4%	
Metastasis	6%	
Simple cysts	20%	
Hepatocellular carcinoma	6%	
Hydatid cysts	12%	

Common hepatic masses were liver abscess in 32%, hemangiomas in 5%, focal nodular hyperplasia in 15%, cholangio carcinoma in 4%, metastasis in 6%, simple cysts in 20%, hepatocellular carcinoma in 6 and hydatid cysts in 12%. The difference was significant (P< 0.05) [Table 2, Figure 2].

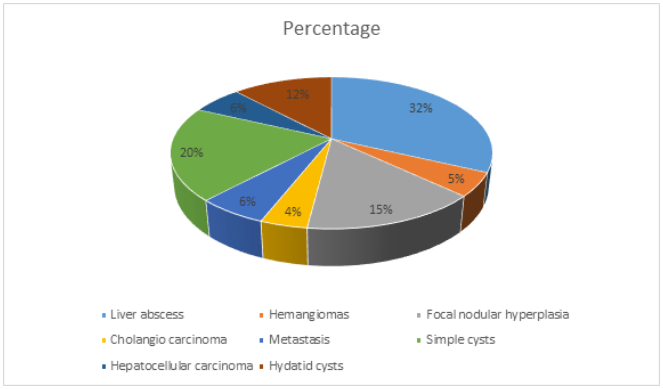
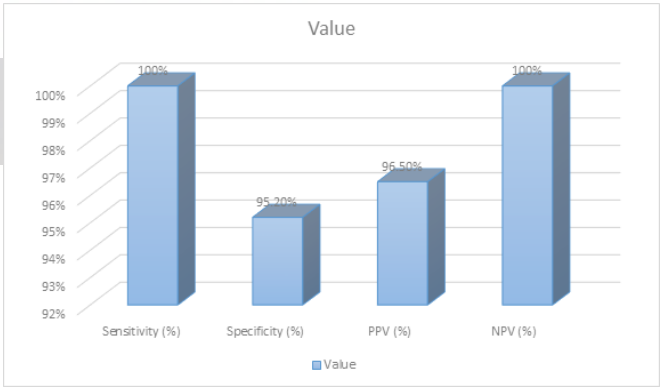


Table 3: Efficacy of CT

Efficacy	Value
Sensitivity (%)	100%
Specificity (%)	95.2%
PPV (%)	96.5%
NPV (%)	100%

Sensitivity of CT in detecting hepatic masses found to be100%, specificity 92.2%, positive predictive value (PPV) 96.5% and negative predictive value (NPV)100% [Table 3, Figure 3].



Discussion

Before that inception helical CT, description of focal liver lesions at CT scan was dependent basically on their appearance during the portal venous phase of enhancement. Hepatic liver masses post great threat to humans due to its high morbidity and mortality.[9] Newer generation CT machines offer high diagnostic value that help in detection of lesions. It plays an important key role in subclassifying lesions into 3 clinical categories.[10] First category are benign mass lesions requiring

no treatment, 2^{nd} category are other benign mass lesions for which treatment is required; and 3^{rd} are malignant hepatic lesions always requiring treatment if possible.[11]

Various differential diagnoses of liver masses should be considered while reaching at specific diagnosis. A history of chronic hepatitis or the features or complications of liver cirrhosis categorizes subjects at risk for HCC and intrahepatic cholangiocarcinoma.[12] At the same time, a history of primary sclerosing cholangitis warns someone against cholangiocarcinoma. In females, prolonged use of oral contraceptive influences them to hepatic adenoma.[13,14] We selected present study to evaluate hepatic masses using CT scan on 68 adult patients.

Our study demonstrated that out of 68 patients, age group 25-35 years had 12 male and 7 female, 35- 45 years had 15 male and 11 female, 45- 55 years had 7 male and 6 female and 55-65 years had 6 male and 4 female. Minami et al,[15] in their study revealed that there were 22 cases of liver metastasis. All cases were detected by CT scan. Breast, head and neck, lung and gastrointestinal (GI) tract were common primary sites. In CT scan images, cluster sign was main feature ie. Multiple metastasis. There was variation in shape, size, growth and vascularity in metastasis cases. It was seen than 15 cases, arterial enhancement was main feature whereas 1 case showed delayed enhancement. Enhancement of wall was evident in 14 patients. Hyperdense area was found in 2 cases and hypodense in 15 cases and in 5 cases, hetergenous enhancement was seen. Target appearance was seen in 4 lesions. In 5 cases, USG incorrectly diagnosed them as pyogenic abscesses.

Our results showed that common hepatic masses were liver abscess in 32%, hemangiomas in 5%, focal nodular hyperplasia in 15%, cholangio carcinoma in 4%, metastasis in 6%, simple cysts in 20%, hepatocellular carcinoma in 6 and hydatid cysts in 12%. Oliva et al,[16] suggested that imaging of liver in suspected malignancy is must as the metastasis in liver is quite common. The common organ from which metastasis may occur are pancreas, stomach, lung, intestine etc. MRI is also considered useful in these patients. Contrast-enhanced magnetic resonance imaging (MRI) using tissue-specific contrast agents are of paramount importance when patients with hepatic metastases are being considered for metastasesectomy. It is evident that cases of chronic liver disease who are at risk for hepatocellular carcinoma should be subjected to periodic liver screening for focal liver detection and that should be performed with ultrasonography (US) and MRI.

We observed that sensitivity of CT in detecting hepatic masses found to be100%, specificity 92.2%, positive predictive value (PPV) 96.5% and negative predictive value (NPV) 100%. Jain et al,[17] included patients in age ranged 20-60 years with liver mass lesions having focal hepatic lesions which were detected on abdominal imaging ie. USG. Contrast enhanced computed tomography (CECT) scan recorded arterial, venous, portal and delayed phase. On MDCT, it was seen that out of 84 focal liver lesions, 72 (85.7%) had benign focal liver lesions and 12 14.3% had malignant lesions. There was 90.5% diagnostic accuracy of MDCT.

Gupta et al,[18] assessed the utility of computed tomography (CT) and ultrasound (USG) in focal hepatic masses diagnosis and compares both modalities for focal hepatic masses which were correlated with histopathological and surgical findings in 40 focal hepatic mass patients of either gender. The diagnosis found to be simple cysts in five, polycystic liver in one, metastasis in twenty- two, hydatid cysts in five, hemangioma in six, hepatocellular in eleven, focal nodular hyperplasia in one, abscesses in sixteen and cholangiocarcinoma in one case. The sensitivity found to be 84.38%, specificity 67.74%, positive likelihood ratio were 2.62 and negative likelihood ratio were 0.23 respectively and for USG it was 100%, 97.14%, 35 and 0 respectively.

Conclusion

It was evident from the study that CT has high diagnostic value in diagnosing cases of hepatic masses.

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