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ACCURACY OF CT-SCAN FOR THE DETECTION OF MALIGNANT LIVER MASS

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Abstract

Background: Malignant liver mass, especially hepatocellular carcinoma (HCC), is the most common primary malignant tumour of the liver representing more than 80% of all primary hepatic malignancies.

Methods: This cross sectional study was carried out in the Department of Radiology. All the clinically suspected patients having hepatic mass at any age with both sexes who were attended in hospital were taken as study population as per inclusion and exclusion criteria. Patients having hepatomegaly due to extra hepatic causes, patients who refused to undergo CT-scan, patients who refuse to do biopsy or whose biopsy result was not available and patients having known hypersensitivity reaction to contrast agent were excluded from this study.

Results: Sensitivity of CT to diagnose malignant lesion was 94.12%, specificity 84.62%, accuracy 90%, positive predictive value 88.89% and negative predictive value 91.67%.

Conclusion: The results of the present study therefore conclude that CT is a useful modality for the diagnosis of malignant liver masses. Since the CT diagnosis correlates with histopathological connection, it is a sensitive modality on the basis of the above findings.

Keywords: Test accuracy, CT-Scan, Malignant, Liver Mass

Introduction:

Malignant liver mass, especially hepatocellular carcinoma (HCC), is the most common primary malignant tumour of the liver representing more than 80% of all primary hepatic malignancies. It is relatively common in equatorial Africa and Asia, rare in United States. On CT-scan, HCC appears as low density lesions as these are supplied mainly by arterial blood rather than portal venous blood and insufficient blood flow in the hepatic artery contributes to necrosis of hepatic tissue and to further lowering of the density of CT-scan. Computed tomography has been highly useful in detecting liver tumours and in determining their extent. However, with the exception of some hepatic lesions containing calcium, extravasated blood, fat or densely enhanced parts, the CT-scan appearance of liver tumours is similar and nonspecific regardless of their histologic type. Dynamic CT sensitivity has been reported as 80% and MRI sensitivity as 40% . Hepatocellular adenoma is the most common benign liver tumours. CT-scan can show a well circumscribed and often encapsulated mass has a low density on non-contest phase, a marked centripetal pattern of enhancement on a phase and a central necrotic area or calcifications. Cystic lesions are readily identified and abscesses are usually distinguished from tumours [1-2].

The present study was designed to evaluate the role of CT-scan in the evaluation of malignant hepatic mass and was correlated with histopathology.

Materials and Methods

This cross sectional study was carried out in the Department of Radiology. All the clinically suspected

patients having hepatic mass at any age with both sexes who were attended in hospital were taken as study population as per inclusion and exclusion criteria. Patients having hepatomegaly due to extra hepatic causes, patients who refused to undergo CT-scan, patients who refuse to do biopsy or whose biopsy result was not available and patients having known hypersensitivity reaction to contrast agent were excluded from this study. Purposive sampling technique was used to collect the patients. Each patient was undergone CT examination of hepatobiliary system (HBS) at the Department of Radiology and Imaging. All CT-scan were performed with a third generation CTscan (Siemans). Somatom (2 - 5) mm thick contiguous slice were taken. These scan were obtained using 120 kv, 75 mm and 0.8 see scanning time for 2 slice. Both pre and post contrast were performed. Oral contrast medium was routinely administrated before the examination. Immediately after completion of bolus injection 8mm contiguous slice were obtained through the upper abdomen by CT-scan. All collected biopsy tissues were sent for histopathological examination in the histopathology department of respective hospital and collected reports were compared with CT-scan diagnosis.

Statistical Analyses

Percentages were calculated to find out the proportion of the findings. Further statistical analysis of the results was done by computer software devised as the statistical package for the social sciences (SPSS, windows version 22.0).

Result

A total number of 30 clinically diagnosed hepatomegaly patients were recruited in the study. The mean (±SD) age of the respondents was 52.30 (±12.60) years. Males (80.0%) were more predominant than females (20.0%). The male and female ratio was found 4:1.

Table 1: Association between CT scan and histo-pathological finding

CT scan finding	Histo-pathological finding		Total
	Malignant	Not malignant	
Malignant	16	2	18
Not malignant	1	11	12
Total	17	13	30

Table 2: Test validity

Sensitivity	94.12%
Specificity	84.62%
PPV	88.89%
NPV	91.67%
Accuracy	90.00%

Sensitivity of CT to diagnose malignant lesion was 94.12%, specificity 84.62%, accuracy 90%, positive predictive value 88.89% and negative predictive value 91.67%.

Discussion

Hepatic masses come to clinical attention when these are felt by the patient as well as discovered on physical examination by the physician or most commonly detected on diagnostic radiological studies [3]. Technologic advances and the expanded use of imaging modalities have led to the increased documentation of hepatic masses. This study was carried out to determine the accuracy of CT scan examination for the evaluation of hepatic masses and it's correlation with histopathological examinations

Sensitivity of CT to diagnose malignant lesion was 94.12%, specificity 84.62%, accuracy 90%, positive predictive value 88.89% and negative predictive value 91.67%. Kang et al. [3] reported CT is 88% sensitivity and 98% specific in the detection of malignant liver mass. Snow et al. [4] conducted a comparative study of CT, USG and scintigraphy in 94 patients with clinically suspected SOL in liver where CT proved to be the most accurate in detecting masses and assessing the complete extent of intra hepatic disease. In their study CT was found 96% sensitivity, 86% specificity and 95% accuracy in the diagnosis of malignant liver

mass. Parveen [5] has observed the sensitivity, specificity and accuracy of CT scan for detecting SOL in liver was 95%, 50% and 81% respectively. These results were almost consistent with this present study. From the result of the present findings as well as findings obtained by a number of investigators, it is apparent that CT scan is ideal and accurate diagnostic imaging modalities for the diagnosis of hepatic masses. There are some limitations of this study. Sample size is small. Furthermore, the purposive sampling was giving a selection bias which was a limitation of the study.

Conclusion

The results of the present study therefore conclude that CT is a useful modality for the diagnosis of malignant liver masses. Since the CT diagnosis correlates with histopathological connection, it is a sensitive modality on the basis of the above findings.

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