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COMPARATIVE STUDY OF CT-SCAN FINDINGS WITH BIOPSY IN LIVER MASSES DONE AT A TERTIARY CARE CENTER

Radiodiagnosis

Bhanupriya Singh* Senior Resident, Departement of Radiodiagnosis, Ram Manohar Lohia Institute of Medical Sciences, Lucknow *Corresponding Author

Khushal N Pawar Consultant Radiologist, Ozone Multispeciality Hospital, Vasai

Suhas S Ghule Associate Professor, Departement of Radiodiagnosis and Imaging, Dr. Vitthalrao Vikhe Patil Foundation's Medical College, Ahmednagar

Dilip L Lakhkar Professor, Departement of Radiodiagnosis and Imaging, Dr. Vitthalrao Vikhe Patil Foundation's Medical College, Ahmednagar

ABSTRACT

Background: More than 80% of all primary hepatic malignancies are hepatocellular carcinoma. Identification of a liver lesion depends on the attenuation difference between normal liver and the lesion. CT helps in detecting tumors and their size in liver quiet successfully. Accurate detection of liver mass is crucial for the deciding the treatment regimens. **Objective:** The study was undertaken to compare the results of CT-scan to histopathology findings. **Methodology:** This cross-sectional study was carried out in the Department of Radiodiagnosis and Imaging, Dr. Vitthalrao Vikhe Patil Foundation's Medical College, Ahmednagar in association with Department of pathology of the concerned institute for histopathological diagnosis from 01-03-2014 to 28-02-2015 for a period of one year. Patients having hepatic mass of any sex or age presenting in the hospital were included in the study. The exclusion criteria were as patients refusing consent, or CT-scan and/or biopsy, known adverse reaction to contrast agent. CT scan and histopathology were done in all the subjects. **Result:** 50 subjects were studied in this study. Mean age of all subjects was 52.88 ± 16.03 years with a range of 18 year to 85 years. 40 cases were male in the study group. Maximum number of cases were in the age group 40-59 years. Out of 28 confirmed malignant cases by histopathology, 27 cases were diagnosed as malignant by CT scan too. Sensitivity of CT to diagnose malignant lesion was 96.4%, specificity 86.4%, accuracy 92%, positive predictive value 90% and negative predictive value 95%. **Conclusion:** CT scan can be used as a tool for the detecting of malignant liver masses.

KEYWORDS

Histopathology, CT-Scan, Hepatocellular carcinoma, Hepatocellular adenoma

INTRODUCTION

More than 80% of all primary hepatic malignancies are hepatocellular carcinoma (HCC).1,2 As compared to America's demographics; it is more common in Asia.3Identification of a liver lesion depends on the attenuation difference between normal liver and the lesion.HCC appears as low-density lesion on CT-scan. Hepatocellular carcinoma has arterial blood supply and not venous. If there is reduced blood flow in hepatic artery, it leads to central necrosis of liver tissue and makes tissue still lower in density on CT-scan.4 CT helps in detecting tumors and their size in liver quiet successfully. On performing computed tomography liver tumors manifest mostly similar nonspecific features. Some lesions containing fat, extravasated blood calcium etc may be distinct.5,6 Hepatocellular adenoma is the most common benign tumor of liver.7 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.8Some liver lesions which might present with a central scar are cholangiocarcinoma, fibrolamellar carcinoma, hemangioma and hepatocellular carcinoma. The study was undertaken to compare the results of CT-scan to histopathology findings.

MATERIAL AND METHODS

This cross-sectional study was carried out in the Department of Radiodiagnosis and Imaging, Dr. Vitthalrao Vikhe Patil Foundation's Medical College, Ahmednagar in association with Department of pathology of the concerned institute for histopathological diagnosis from 01-03-2014 to 28-02-2015 for a period of one year. Ethical approval for the study was taken before starting the study. Convenience sampling method was used to include the subjects in the study. Patients having hepatic mass of any sex or age presenting in the hospital were included in the study. The exclusion criteria were as patients refusing consent, or CT-scan and/or biopsy, known adverse reaction to contrast agent. All subjects underwent CT-scan examination of the hepatobiliary system (HBS) at the Department of Radiodiagnosis and imaging, Dr. Vitthalrao Vikhe Patil Foundation's Medical College, Ahmednagar. The CT imaging was performed using 16 slice CT machine. 2-5 mm thick slices were taken. Both pre and post contrast studies were done. Oral contrast medium was administered routinely before examination. Biopsy of tissue samples were sent for histopathological examination and results obtained were compared with CT scan diagnosis.

Statistical Studies

Statistical package for Social Sciences (SPSS ver. 16) was used for statistical analysis. Percentages were calculated to find out proportion of findings. Statistical significance was set at p value < 0.05 and confidence interval at 95% level. 80% statistical power was taken with 5% statistical error. Student's t-test and chi-square test were used as applicable.

RESULTS

Data from 50 clinically diagnosed hepatomegaly patients was used in the study. The mean age of all the subjects was 52.88 ±16.03 years. 40 (80%) of the subjects were males and 10 (20%) of the subjects were females. T-test was done on age and the difference in age of male and female was not statistically significant (p value:0.641). [Table1] The patients were between the ages 18 years and 85 years. The highest number of patients 28 were in the age group 40-59 years. Out of the subjects 28 cases were confirmed as malignant by histopathology and 22 were diagnosed as benign liver mass (p <0.001). [Table 2] Out of the 28 confirmed cases CT-scan diagnosed 27 cases as malignant liver tissue and 18 non-malignant by both tests. [Table 3] Sensitivity of CT to diagnose malignant lesion was 96.4%, specificity 86.4%, accuracy 92%, positive predictive value 90.0% and negative predictive value 95.0% [Table 4]

Table 1: Age difference between males and females

Parameter	Male	Female	p-value
Age	50.15±12.91	55.1±15.10	0.641

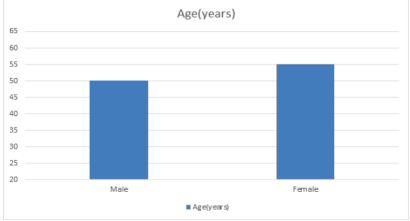

Table 2: Age and sex distribution of study population (n = 50).

Age Group	Sex		Total
	Male	Female	

< 20 years	0	1	1
20-39 years	8	0	8
40-59 years	21	7	28
>60 years	11	2	13
Total	40	10	50

Table 3: Histopathology and Computed Tomography findings comparison (n=50)

CT-scan diagnosis	Histopathological Diagnosis		Total
	Malignant	Non-Malignant	
Malignant	27 (87%)	4 (13%)	31 (62%)
Non-Malignant	1 (5.2%)	18 (94.7%)	19 (38%)
Total	28 (100%)	22 (100%)	50 (100%)

Table 4: Test validity parameters for CT-scan diagnosis of liver mass.

Parameters	Value
Sensitivity	96.4%
Specificity	81.8%
Positive Predictive Value	87.1%
Negative Predictive Value	94.7%
Accuracy	90.0%

DISCUSSION

Hepatic tumors are a large group of masses that have both malignant and benign subtypes. Their presentation can be varied from localizing, such as jaundice and right upper quadrant pain, to vague, such as fatigue, weight loss, and anorexia. Hepatic masses are mostly discovered felt by the patient as well as on physical examination by the physician or are also commonly detected on diagnostic radiological studies.9,10 This study was done to compare and determine the usefulness of CT-scan studies for hepatic tumors and compare with pathological confirmation.

The results by histopathological test were considered final and radiological findings were compared. Serste et al.11 in their study compared CT, MRI and biopsy to test for small HCC and found that CT is useful but biopsy should be done in small HCC. Kang et al.12 showed that CT is 88% sensitivity and 98% specific in the detection of malignant liver mass. Snow et al.13 conducted a comparative study of three diagnostic processes namely 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. They found CT-scan to be 96% sensitivity, 86% specificity and having 95% accuracy in the diagnosis of malignant liver mass. Parveen et al.14 has found the sensitivity, specificity and accuracy of CT scan for detecting SOL in liver was 95%, 50% and 81% respectively. In contrast Takayasu et al.15 concluded that CT was not very useful in detecting early hepatocellular malignancy. The results of this work are largely consistent with results from other studies. Thus, a number of findings similar to this work makes us conclude that CT-scan is an accurate diagnostic imaging technique for hepatic masses. The limitations of this study are the small sample and convenient sampling method.

CONCLUSION

The results of the two diagnostic methods namely the histopathological examination and Computed tomography scan are quite similar. CT-scan as a diagnostic instrument is very useful in the diagnosis of liver masses. Also, the CT diagnosis correlates with histopathological testing, it could be considered a sensitive modality.

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