

Frequency of Hepatic Metastasis in newly diagnosed patients of Breast Cancer by Computed Tomography

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ABSTRACT

Background: Liver is the third most common site affected by distant metastasis in breast cancer. Many studies have been conducted previously regarding incidence of hepatic metastasis in breast cancer patients during course of disease, however there is limited literature published about occurrence of hepatic metastasis at the time of initial diagnosis of breast cancer

Aims and Objectives: To find out the frequency of hepatic metastasis in newly diagnosed patients of breast cancer by computed tomography.

Methods: This was prospective study conducted in 1480 newly diagnosed female patients of breast cancer referred to radiology departments Hayatabad Medical Complex for staging CT scan from 2018-2020. Multiphasic CT scan abdomen was done with 28 slice CT scanner. Single radiologist evaluated the images based on the data was stratified according to age, histological type and tumor size.

Results: Hepatic metastasis were detected in 22 patients among 1480 patients with incidence of 1.48%. Hepatic metastasis was more common in age group of 40-65 yrs and with increasing tumor size.

Conclusion: This study revealed that frequency of hepatic metastasis on computed tomography is less common in newly diagnosed patient of breast cancer. It was also found that young age and increased tumor size are risk factors for hepatic metastasis of breast cancer

Keywords: Liver, Breast cancer, Metastasis, Computed tomography.

INTRODUCTION

Breast cancer is very common in women and is major cause of cancer related mortality in female world wide¹. The incidence of remote metastasis in breast cancer at time of initial diagnosis is approximately 4-10%². After lung and bonemets, liver is third common site for distant metastasis in patient with breast cancer³. Breast cancer synchronous hepatic metastasis (BCSHM) is the presence of liver metastasis in newly diagnosed breast cancer and is also known as de novo hepatic metastasis, which is different from liver metastasis that develop later in course of disease⁴.

The incidence of synchronous liver mets with breast at the time of initial diagnosis is 1.44%⁵. It has been observed in many studies that distant metastasis, particularly hepatic mets in breast cancer indicated poor prognosis and short survival time⁶. The median survival time of patients with breast cancer and liver metastasis is 4–8 months if ignored and not treated initially⁷. It is very important to detect hepatic mets in breast cancer patients early because prognosis and morbidity of patient is significantly affected by it.⁸

Imaging gives important information about the presence, extent and distribution of distant metastasis². Different imaging modalities are used these days to detect hepatic mets in patients with breast cancer including ultrasound, Positron emission tomography, MRI and CT scan. Each of these modalities have different advantages and disadvantages but presently Ct scan is most commonly used because it is readily available, cost effective, short scan time and is not operator dependent.⁹

This study was conducted to characterize the prevalence of hepatic mets in newly diagnosed patients of breast cancer. Liver mets are relatively uncommon in breast cancer patients and few studies are conducted from Asia regarding incidence of hepatic mets in breast cancer patients, making its treatment challenging. The results of this study will be helpful for early identification of liver mets and for guiding management and timely intervention of such patients.

MATERIAL AND METHODS

This was prospective cross-sectional study in which total 1480 patients of newly diagnosed primary breast cancer were included. Breast cancer patients referred from Oncology ward to Radiology department Hayatabad Medical Complex for staging CT scan from February 2018 to February 2020 were included.

Only female patients older than 20 years and biopsy proven newly diagnosed patients of breast cancer were included. Patients undergoing treatment of breast cancer, recurrent breast cancer, male patients and patients younger than 20 years were excluded from the study.

Patients were scanned by 128 slice helical scanner CT scan. Triphasic liver protocol was used and Images were taken at 30,50 and 70 sec after start of intravenous injection of iodinated contrast at rate of 5 ml/sec.

Presence of hepatic lesions with characteristics of metastasis on CT scan were recorded. Incidence was defined as the number of patients diagnosed with hepatic metastasis divided by the total number of breast cancer patients.

Data was also stratified by clinical and demographic characteristics like age at diagnosis, tumor size, and histological type.

RESULTS

This study included total 1480 patients with initial diagnosis of primary breast cancer. Age range of patients was from 24-83 years. Tumour size was less than 2 cm in 23.3%(n=345) patients, 2-4 cm in 45% (666) patients while in 31.7% (n=469) patients, tumour size was more than 4 cm. 56% (n=828) patients were post menopausal while 44%(n=652) patients were premenopausal.

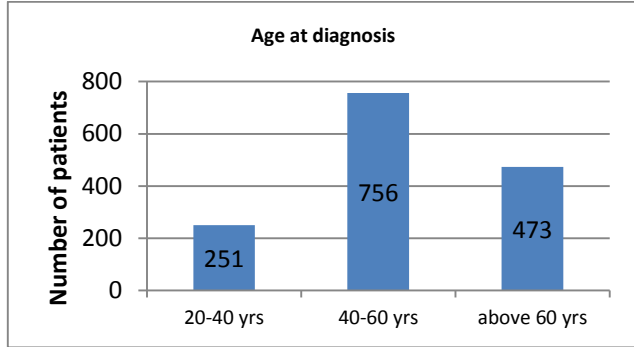


Figure 1: Age distribution of newly diagnosed patients of breast cancer

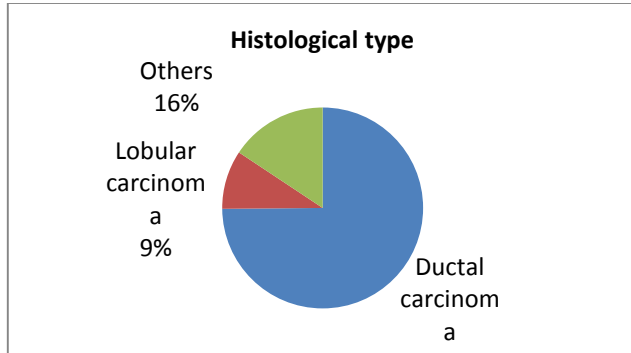


Figure 2: Histological type of breast cancer

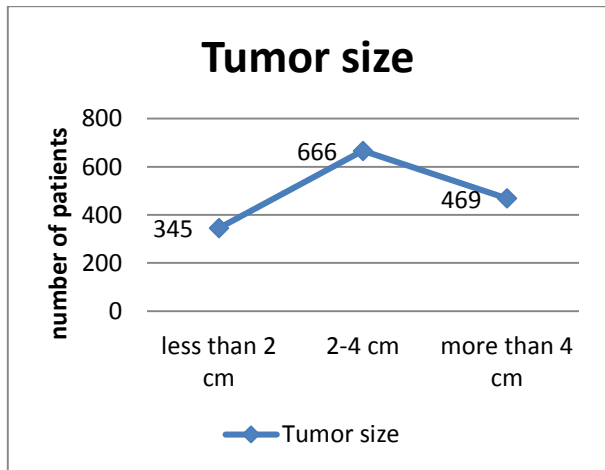


Figure 3: Tumor size of breast cancer

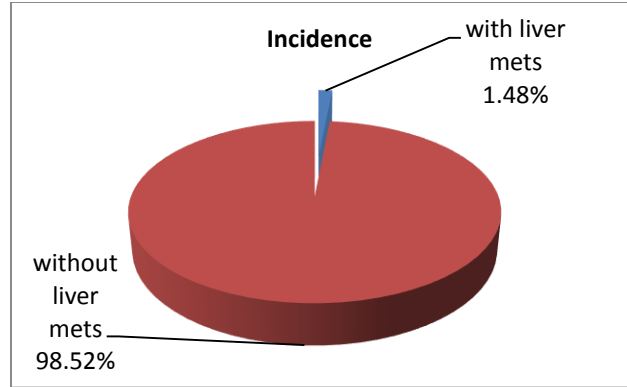


Figure 4: Incidence of hepatic metastasis in breast cancer

Among 1480 total primary breast cancer patients, hepatic metastasis on triphasic CT scan were found in 22 patients with incidence of 1.48%. It was found that liver metastasis were more common in age group of 40- 60 yrs accounting for 54.5% (n=12). Hepatic metastasis were also more common with increasing tumour size i.e. 45.4% (n=10) patients having tumor size of more than 4 cm , while 40.9% (n=9) patients had tumor size of 2-4 cm. Histological type was ductal carcinoma in 59.1%(n=13), lobular carcinoma in 18.2%(n=4) and other types in 22.7% (n=5) patients.

Table 1: The clinical factors of patients with hepatic metastases from breast cancer

Variable	Number of Patients with liver mets n=(22)	Percentage %
Age at diagnosis		
20- 40 yrs	3	13.6
40-60 yrs	12	54.5
Above 60 yrs	7	31.8
Tumor size		
Less than 2 cm	3	13.6
2-4 cm	9	40.9
Above 4 cm	10	45.4
Histological type		
Ductal carcinoma	13	59.1
Lobular carcinoma	4	18.2
Others	5	22.7

DISCUSSION

There is definitive tendency of breast cancer to metastasize distantly including skeletal, pulmonary, hepatic and lymph nodes¹⁰. Distant metastasis of breast cancer is associated with poor prognosis¹¹. Early detection of hepatic metastasis in patients with breast cancer is important for successful and timely treatment strategies¹². Primary imaging modalities used to assess and characterize hepatic mets are multiphase CT and MRI however multiphase CT is preferred for the detection of hepatic metastasis¹³. However It is found that benign hepatic lesions are more common than metastasis in cancer patients, so it is important to assess and characterize the hepatic lesion accurately on imaging¹⁴.

In this prospective study, data of total 1480 newly diagnosed patients of breast cancer was analyzed for incidence of synchronous liver mets at initial diagnosis. Hepatic metastasis were found in 22 patient among them

with incidence of 1.48%. This observation is consistent with previous studies done by Xiao et al⁵, Zhao et al⁶ and Xia et al⁸ who also found incidence of 1.44%, 1.4% and 1.5% respectively. In contrast to these studies, a study done by Hoe et al¹⁵ found that 5.2% patients undergoing treatment for breast cancer developed hepatic mets during disease course. However in this study incidence of hepatic mets that appear during course of breast cancer was analyzed and not synchronous hepatic mets in newly diagnosed patients of breast cancer

In our study liver mets were more common in patients age group of 40-60yrs (54.5%) while patient with aged above 60yrs at initial diagnosis had decreased risk of liver metastasis (31.8%) which is comparable to study done by Zhao et al⁶ who also found that 46.9% who had liver mets at initial diagnosis were in age group of 40-60yrs as compare to 35% in patients 61-80yrs and only 7.4% in patients above 80 yrs.. Previously published studies done by Xiao et al⁵, Zhao et al⁶ and Xia et al⁸ shows that young age is more susceptible to develop hepatic mets at time of initial diagnosis of breast cancer than old age. This may be possibly due to reason that capacity of factors which facilitate metastases are weakened by the pathophysiological changes that occur with aging⁶.

In our study we found that liver mets were more common with increasing size of tumor and 45.4% patients with liver metastasis had tumor size more than 4 cm. This observation is consistent with study done by Yazdani¹².

Many studies have been conducted previously about incidence of hepatic mets in breast cancer patients, however mostly they were retrospective and assessed development of liver mets during the course of disease rather than at time of initial diagnosis^{16,17,18}.

Our study is prospective and give important information about prevalence of hepatic metastasis at initial diagnosis of breast cancer and its demographic and clinical factors. The result of this study can be very useful for clinicians as detection of hepatic mets at initial diagnosis can alter treatment strategies. Also risk factors for hepatic mets in breast cancer patients at initial diagnosis can be identified from this study.

However there are some limitations of this study. First the sample size was small so true prevalence of hepatic metastases in breast cancer patients could not be evaluated. Secondly the results were analyzed from data collected in one centre, so multicentre study would give better insight and generalizability of results. Thirdly other variables like menopausal status, family history, parity were not considered in this study which may have effect on occurrence of hepatic mets in such patients.

Further population based studies with large sample size considering the other variable should be done to address these limitations.

CONCLUSION

This study revealed that frequency of hepatic metastasis on computed tomography is less common in newly diagnosed patient of breast cancer. It was also found that young age and increased tumor size are risk factors for hepatic metastasis of breast cancer

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