



# Mastalgia and Why It Should Be Evaluated With Imaging in Areas Where Use of Breast Cancer Screening Services are Unsatisfactory

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## ABSTRACT

**Objective:** Mastalgia or breast pain is a very common symptom in women attending breast clinic. The aim of this study was to evaluate whether imaging for mastalgia leads to cancer detection in an area where routine breast cancer screening services are underutilized.

**Materials and Methods:** This prospective study was performed between 1<sup>st</sup> March 2021 to 31<sup>st</sup> January 2023 at a tertiary care academic institution of central India. All patients underwent through clinical examination by a surgeon. Then patients were referred for ultrasound and/or X-ray mammography (MMG) depending on age. Cancer detection rate was calculated.

**Results:** The final cohort consisted of 176 patients with mastalgia and without any abnormality on clinical breast examination. Sixteen patients had mass lesion on radiology and core needle biopsy resulted as infiltrating duct carcinoma in 7 patients and benign phylloides tumor in one patient. Overall case detection rate for cancer was 4%.

**Conclusion:** The breast cancer detection rate in patients presenting with mastalgia was low. However, in the absence of routine mammographic screening in the Indian general population, these would have been missed. Hence, diagnostic assessment for mastalgia is an appropriate strategy in countries where routine screening MMG is lacking.

**Keywords:** Mastalgia; breast cancer; screening; mammography

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## Key Points

- Mastalgia is the most common presenting complaint in breast clinics.
- Imaging is usually not recommended if clinical examination is normal.
- However, in countries where routine screening is not available, imaging can lead to early breast cancer detection.

## Introduction

Mastalgia or breast pain is a very common symptom in women attending breast clinic and it is thought to occur in up to 60–70% of women in their lifetime (1-3). Exact etiopathogenesis of mastalgia is not well understood and is multifactorial (2, 4). Guidelines for evaluation and treatment of mastalgia remain controversial. The American College of Radiology (ACR) Practice Guidelines suggests diagnostic imaging only for a persistent and focal area of pain, defined as involving 25% of the breast and axillary tissue (4, 5). Many centres, including ours, prefer to image all patients presenting with mastalgia (6). Many other studies have reported that such imaging evaluation for

patients with mastalgia leads to unnecessary biopsies, increased costs, patient anxiety and overutilization of healthcare resources (7, 8).

The aim of this study was to evaluate whether imaging for mastalgia leads to cancer detection in an area where routine breast cancer screening services are underutilized.

## Materials and Methods

This prospective study was performed between 1<sup>st</sup> March 2021 and 31<sup>st</sup> January 2023, at a tertiary care academic institution in central India after approval by Netaji Subhash Chandra Bose Medical College

Jabalpur Institutional Ethics Committee (decision no: IEC/2020-23, date: 07.012021). Informed consent was obtained from patients.

Inclusion criteria were age above 18 years and all patients presenting with mastalgia irrespective of focality, duration, or cyclical nature. Patients with any abnormal clinical finding, such as palpable mass, nipple discharge or history of breast implant were excluded. Patients were evaluated as per department protocol. All patients underwent through clinical examination by a trained breast surgeon. Then patients are referred for ultrasound (USG) and/or X-ray mammography (MMG) depending on age, usually on the same day or the next day. Women less than 30 years of age underwent USG alone while between 30 to 40 years of age underwent additional MMG in case of any abnormal finding on USG and patients above 40 years underwent MMG alone (plus USG if any abnormal finding on MMG). The radiologist was not blinded with regards to symptoms and had over 10 years experience. In India, there is no national guidelines for population-based screening MMG. Women may visit a medical centre and request for a regular screening MMG.

### Imaging Technique and Interpretation

The sonographic examination of breast and axilla was performed using a high frequency linear probe with frequency range 7–12 MHz (Alpinion E-CUBE -i7, Magokjungang 14-ro, Gangseo-gu, Seoul, Republic of Korea). MMG was done using MMG system 3000 Nova (Siemens Healthcare Private Limited Vikhroli East, Mumbai – 400 079, India). The patients were positioned supine with the arm on the side of interest relaxed up by the side of the head. Both the breast were exposed and all quadrant were examined by sweeping the transducer in radial and anti-radial direction to visualise the abnormality. Both axillae were also examined for any mass extension or lymph node abnormality. Lesions were also examined under color Doppler USG and results were noted. Examinations were interpreted by two dedicated breast radiologists using the ACR Breast Imaging-Reporting Data System (BI-RADS) lexicon (9). Histopathological samples for diagnosis were obtained under USG (routinely a 14-gauge core needle device) guidance, if indicated.

### Statistical Analysis

The data of the present study was recorded in Microsoft excel sheet. Descriptive statistics and Z test was used to compare patient demographics, pain characteristics, and imaging modality between all patients/cases and those with breast cancer. All analysis was performed using SPSS software (IBM Inc., Armonk, NY, USA). *P* values less than 0.05 were considered statistically significant.

### Results

A total of 292 women presented with mastalgia during the study period. Of these, 116 patients were excluded; 33.9% (99/292) had an associated palpable abnormality and 5.8% (17/292) had a skin/nipple abnormality. The final cohort consisted of 176 patients with mastalgia and without any abnormality on clinical breast examination. Baseline demographics are presented in Table 1. The frequency (%) of various BI-RADS categories by MMG and USG is provided in Table 2.

Sixteen (9.1%) patients had mass lesion on radiology and core needle biopsy results were infiltrating duct carcinoma in 7 patients (early breast cancer) and benign phylloides tumor in one patient. Remaining 8 patients had benign pathology. Overall case detection rate for cancer was 4%. The median (range) age of patients diagnosed with cancer

was 38 (22–58) years. Patients diagnosed with malignancy were older compared to the overall patient population (mean  $39 \pm 8.5$  vs.  $34.4 \pm 6.8$  years,  $p = 0.06$ ) and none of the patients had personal history of breast cancer.

In the cohort, 45% had cyclical pain and 55% non-cyclical pain. The proportion of patients with focal pain was 44% whereas the remainder (56%) had diffuse pain. Unilateral pain occurred in 47% cases whereas in 53% pain was bilateral. No statistically significant differences in pain characteristics were noted between the whole cohort with breast pain and those who were diagnosed with malignancy.

### Discussion and Conclusion

In this cohort of patients where routine screening MMG is lacking, the case detection rate for breast cancer was 4% in patients presenting with mastalgia and without any palpable findings. The age group of patients diagnosed with malignancy was similar to the age group of patients without malignancy. All diagnosed patients had no familial risk factor.

Table 1. Patient demographics and frequency details

Variable	
Age, mean $\pm$ SD	34.4 $\pm$ 6.8 years
<31 years	37
30–40 years	25
41–50 years	24
>51 years	13
<b>Mastalgia</b>	
Left breast	94 (53.40%)
Right breast	69 (39%)
Bilateral	13 (7.39%)
<b>Breast density</b>	
Extremely dense	19 (11%)
Heterogeneously dense	72 (41%)
Scattered fibro-glandular density	60 (34%)
Fatty	25 (14%)

SD: Standard deviation

Table 2. The frequency (%) of various BI-RADS categories by mammogram and ultrasound

BI-RADS category	By mammogram (%)	By ultrasound (%)
1	88 (70%)	93 (53%)
2	14 (11%)	53 (30%)
3	6 (5%)	18 (10%)
5	3 (2%)	12 (7%)
0	15 (12%)	-
Total	126 (100%)	176 (100%)

BI-RADS: Breast Imaging-Reporting Data System

Breast cancer has some striking differences in Asian women compared to their western counterparts (10). Although its incidence is increasing rapidly worldwide, the highest increase in incidence is seen in Asian countries (10, 11). Age at diagnosis is lower in Asian countries, which is true in India as well. The median age of patients from India has been reported to range from 35 to 45 years (12-14). Breast cancer in Indian women is also more aggressive, with a high proportion of triple negative breast cancers (14, 15). Despite being the most common cancer in India, onset at younger age and aggressive nature, there is no mandatory screening MMG in India. Hence any patient presenting with a breast complaint is also an opportunity to screen her for breast cancer. Our results showed that 4% of patients with mastalgia as the presenting complaint were ultimately diagnosed with breast cancer.

Multiple studies have evaluated the role of imaging in mastalgia. A study from Canada found 0.4% CDR in women with mastalgia and concluded that imaging for isolated breast pain is unnecessary and overutilization of healthcare resources. However, they recommended routine screening MMG to be encouraged (16). Another study among American women concluded that focal breast pain is rarely associated with malignancy and imaging should be deferred if there are no other clinical findings, and a negative mammogram (17). A study from the United Kingdom also showed that pain is not a frequent symptom of breast cancer (6). However, these authors recommended that direct testing with MMG would be safe, effective and efficient practice. All these studies advising against imaging for mastalgia, are from high income countries and have a screening MMG program. Unfortunately, this is not the case with India. More so, our center is located in central India having a high proportion of underprivileged citizens in the population. For these patients, imaging of the breast when they come to clinic for mastalgia, can be the only time when they undergo screening and it should be utilized.

Our study has several limitations. As it was conducted at a tertiary academic institution our results may not be generalizable. Referral bias is another limitation, as general practitioners and hospitalists do not always refer patients with mastalgia. Clinical examination was also performed by multiple surgeons. Both USG and MMG was performed in women over 30 years at the discretion of surgeon/radiologist and a very small number of patients underwent both examinations. Study would have been more significant in terms of which imaging modality to prefer if both USG and MMG were done in all patients and few cancers were missed in one modality but detected on other. Consequently, we would have been able to make recommendations about the benefits of USG in the setting of a negative mammogram, but this was not possible. Another limitation was the low number of cancer detected. However, to the best of our knowledge, ours is the largest study with largest proportion of cancers detected in evaluation of mastalgia from India.

The breast cancer detection rate in patients presenting with mastalgia was low at 4%. However, in the absence of routine mammographic screening in Indian general population, these cases of breast cancer would otherwise have been missed. Hence, diagnostic assessment for mastalgia is an appropriate strategy in countries where routine screening MMG is lacking.

**Ethics Committee Approval:** Approval by Netaji Subhash Chandra Bose Medical College Jabalpur Institutional Ethics Committee (decision no: IEC/2020-23, date: 07.01.2021).

**Informed Consent:** Informed consent was obtained from patients.

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**Conflict of Interest:** The authors have no conflicts of interest to declare.

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