

Benign Breast Disease Incidence in Patients with Mastalgia: Observations from a Tertiary Care Hospital in Lahore-Pakistan

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ABSTRACT

Background: Benign breast diseases (BBD) are a frequent cause of mastalgia, both worldwide and in Pakistan. Hence recognition of BBD using clinical signs and sonographic breast imaging is important to reduce the number of unnecessary radiation exposure in the form of mammography and invasive biopsies and consequently avoid delay in the diagnosis. Thus, this study was conducted to assess the prevalence of the subtypes of BBD in the local population presenting with mastalgia.

Patients and Methods: It was a cross sectional study conducted in Radiology Department of Lahore General Hospital, Lahore from 1st January till 30th June, 2022. Total 301 females fulfilling inclusion criteria referred from Surgery OPD and were enrolled after taking informed consent. Patients were clinically examined to assess and exclude any palpable lumps and to validate mastalgia. Sonographic evaluation of the breast was performed by three independent Consultant Radiologists following updated guidelines. The probe frequency was between 4.5MHz - 9MHz. Other technical parameters were adjusted accordingly. Colour Doppler and spectral Doppler techniques were used to further assess the lesion and categorize into the BBD lesions. Data was analysed by using SPSS version 20. Quantitative data like age, and laterality was presented by mean and standard deviation. Qualitative data like type of the breast lesion was presented by frequency and percentages. Chi-square test was applied to check the significance of the results with p -value ≤ 0.05 .

Results: The mean age of enrolled patient was 31.47 (+10.59) years. The mean duration of symptoms was 5 months. Out of 301 females, the imaging was normal in 89 (29.6%), while 92 (30.6%) patients had findings in right breast, 74 (24.6%) in left and 46 (15.3%) in bilateral breast. Overall, ductal dilatation was most common cause for mastalgia (9.8%). Fibroadenoma being the second most common finding (8.8%). Other causes being non-puerperal mastitis (8.6%), abscess (6.3%) and benign cyst (5.6%).

Conclusion: BBD are the most common cause of mastalgia in our population with duct ectasia being the most common type in second and third decade followed by fibroadenoma.

Keywords:

Mastalgia, Benign Breast Diseases, sonography

INTRODUCTION

Mastalgia refers to pain in the breast tissue and is the most common presenting complaint in the breast clinics.¹ Benign breast diseases (BBD) are the frequent cause of mastalgia, both worldwide and in Pakistan, where they have a prevalence of 26%.^{2,3} In United Kingdom (UK) almost 1 million women are detected with BBD annually.⁴ But the exact incidence is still unexplored in many parts of the world.⁵ BBD encompasses a group of benign disorders that presents with a wide variety of symptoms including cyclical mastalgia, non-cyclical diffuse or focal pain, swelling, nipple discharge or palpable lump.⁶ The aetiology of

BBD may be broadly classified into: developmental abnormalities, inflammatory and related lesions, proliferative stromal lesions and benign neoplasms.^{7,8}

Most of the patients presenting with mastalgia in breast clinics turn out to have benign lesions, falling in Breast Imaging and Reporting Data System (BI-RADS) category 2 or 3.^{2,9} Hence recognition of BBD using clinical signs and sonographic breast imaging is important to reduce the number of unnecessary radiation exposure in the form of mammography and invasive biopsies and consequently avoid delay in the diagnosis, especially in a country like ours which has minimal resources and overwhelming patient load.⁹ This study was conducted to assess the prevalence of various subtypes of BBD in the local patient population presenting with mastalgia. This knowledge will help in giving a confident diagnosis on sonography alone, thus reducing further investigations like Mammography, Magnetic Resonance Mammography (MRM), invasive

Conflict of Interest: The authors declared no conflict of interest exists.

Citation: Yasin A, Nasim R, Raman R, Rubab S. Benign breast disease incidence in patients with mastalgia: observations from a tertiary care hospital in Lahore-Pakistan. *J Fatima Jinnah Med Univ.* 2023; 17(4):169-172.

DOI: <https://doi.org/10.37018/JFJMU/ABE/2487>

biopsies and hormonal analysis. The delay in the diagnosis and management of the patient will also be significantly reduced. It will help to reduce patient burden on the healthcare facility.

PATIENTS AND METHODS

This prospective study included consecutive patients referred by surgeons from OPD-based Breast clinic of Lahore General Hospital to the Radiology Department for sonographic evaluation of the breasts with presenting complaint of mastalgia, from 1st January till 30th June, 2022. Patients falling in the reproductive age group (13 to 45 years age) with complain of mastalgia in either breast for atleast one week were enrolled after taking written informed consent, irrespective of the phase of menstrual cycle they were in, as the study focused on BBD rather than hormonal and etiological correlation. The patients with conclusive sonographic findings were included. Sample size of 301 was calculated with prevalence of 26%, a confidence interval of 95% and margin of error 5%.³ Pregnant or lactating females, patients with history of recurrent breast abscess or patients with strong family history or diagnosed with breast carcinoma, were excluded. The patients with suspicious or suggestive sonographic findings fell under BIRADS category 0 were also excluded as they required further investigations such as correlative Mammography and Magnetic Resonance Mammography (MRM). All patients were clinically examined in Breast clinic to assess for any palpable lumps and to validate mastalgia by the surgeon. The findings were documented and mentioned on referral forms. Sonographic evaluation of both breasts was performed in a single patient, right side followed by left side, irrespective of unilateral or bilateral mastalgia. It was performed by three independent Consultant Radiologists following updated guidelines using GE® Logic S8 ultrasound machine utilizing high frequency linear probe.¹⁰ The guidelines included positioning the patient in supine with a slight tilt (up to 15°) to the contralateral side of the breast being evaluated. Sequential sweeping of the breast surface in a radial pattern, extending from the axillary space, parasternal and clavicular surfaces towards the nipple was done. Retro-areolar space was evaluated by angling the probe, placed in areolar region, towards retro-areolar ducts. The probe frequency was adjusted between 4.5MHz upto 9MHz, depending upon the thickness of the breast tissue being examined. The technical parameters including depth of focal zone, gain and time-gain compensation were adjusted according to the requirement of individual patient. Colour Doppler

and spectral Doppler techniques were used to further assess the lesion and categorize into the BBD lesions. The lesions were categorized as: (1) Duct Ectasia – sonographically dilated ducts with more than 2mm diameter, with or without intra-ductal hyperechoic foci and peri-ductal hypervascularity (evident as vascular blush on Doppler imaging) due to peri-ductal mastitis (Figure 1), (2) Benign cyst - well-circumscribed, anechoic, thin echogenic external capsule, posterior enhancement and lateral shadowing on ultrasound imaging with no flow on doppler, Fibro-cystic disease - cluster of multiple tiny cysts (3) Breast abscess - an irregular hypoechoic debrinous collection with no internal blood flow, can be associated with a thick echogenic periphery with increased vascularity. Lactating females were excluded from the study so only non-lactational breast abscesses were included, both of acute and chronic etiology. (4) Fibroadenoma on sonogram evident as slightly lobulated lesion, horizontal orientation, iso-echoic or slightly hypoechoic echotexture, well-defined curvilinear margin, with or without internal blood flow on doppler. (5) Phyllodes tumor - mildly hypo-echoic mass, usually pseudo-capsulated without posterior acoustic shadowing with mild internal vascularity. (5) Intra-ductal papilloma - circumscribed duct ectasia with intra-luminal echoic material. Colour Doppler examination will reveal marked flow in fibrovascular stalk.^{9,11,12} Data was entered and analysed by using SPSS version 20. Quantitative data like age, and laterality was presented by mean and standard deviation. Qualitative data like type of the breast lesion was presented by frequency and percentages. After this chi-square test was applied to check the significance of the results with p-value ≤ 0.05.

Sample Size: For this study sample size was calculated using the WHO calculator. Sample size will be 301 with a confidence interval (Z) of 95%, margin of error (d) 5% with a prevalence of 26.61/100,000(reference).

$$[n = \frac{Z^2 \times p \times (1-p)}{d^2}], n = \text{sample size.}$$

RESULTS

Total 301 females referred from surgery with primary complain of breast pain were scanned. The mean age of enrolled patient was 31.47 (+ 10.59) years, youngest being 15 years of age and eldest being 80 years. The mean duration of symptoms was 5 months. The imaging was normal in 89 (29.6%), while 92 (30.6%) patients had findings in right breast, 74 (24.6%) in left and 46 (15.3%) in bilateral breast. (Table A and B)

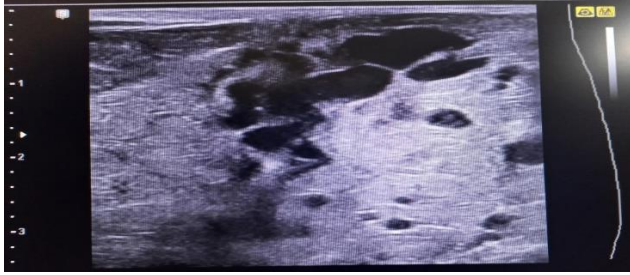


Figure 1: Gray-scale sonographic image of right breast of a 38-year-old female with complaint of mastalgia. Multiple dilated tortuous ducts are seen with diameter of about 18mm with few internal mobile debris contents, in keeping with duct ectasia.

Table-A: Laterality of mastalgia based on history

History	Frequency	Percentage
Valid		
Right mastalgia	56	18.6
Left mastalgia	41	13.6
Bilateral mastalgia	204	67.8
Total	301	100.0

Table-B: Laterality of sonographic findings

Laterality of finding:	Frequency	Percentage
Valid		
Bilateral normal	89	29.6
Right	92	30.6
Left	74	24.6
Bilateral abnormal	46	15.3
Total	301	100.0

Table-C: Different varieties of pathological lesions categorized as Benign Breast Disease

Findings	Right Breast	Left Breast	Total
Normal	163 (54.1%)	181 (60.1%)	344(57.1%)
Duct ectasia	37 (12.2%)	22 (7.3%)	59 (9.8%)
Fibroadenoma	32 (10.6%)	21 (6.9%)	53 (8.8%)
Non-perpeural mastitis	19 (6.3%)	33 (10.9%)	52 (8.6%)
Abscess	21 (6.9%)	17 (5.6%)	38 (6.3%)
Benign cyst	17 (5.6%)	17 (5.6%)	34 (5.6%)
Peri-ductal mastitis	5 (1.6%)	8 (2.6%)	13 (0.1%)
Focal ductitis	2 (0.6%)	2 (0.6%)	4 (<0.1%)
Lipoma	3 (0.9%)	0 (<0.1%)	3 (<0.1%)
Sebaceous cyst	2 (0.6%)	0 (<0.1%)	2 (<0.1%)
Total	301	301	602

Overall, ductal dilatation was most common imaging finding associated with mastalgia (12.3 % in right breast and 7.3% in left breast). Fibroadenoma being the second most common finding. (10.3% in right & 6.0 % in left) as described in Table-C

DISCUSSION

There has been increase in the awareness campaigns running across country in the recent years, including PINKtober and youth engagement program by Pink Ribbon® and many other organizations. This has led to increase in awareness about breast cancer and self-assessment, at least in Pakistan's metropolitan cities that have higher literacy rates and better health facilities. However, the awareness still remains shallow in other under-developed areas of Pakistan.¹³ A local study

revealed only 37.4% of the respondents were aware of the breast cancer.¹⁴ Another factor contributing to the increased patient load is high population growth and double disease burden.¹⁵ Hence the patients visiting the breast clinics have greatly increased, leading to exhaustion of the little resources that our health facilities have.¹⁶ There is a dire need of early recognition of benign breast diseases on sonography to reduce number of unnecessary investigations and speed up diagnosis.

In our study 29.6% of patients with mastalgia had a normal sonographic study. This can be attributed cyclical mastalgia experienced due to cyclical hormonal changes, as described by Siddique and his co-workers where the prevalence of mastalgia was 35.5%.¹⁷ The most common benign breast disease in this study is duct ectasia followed by fibroadenoma. The study conducted by Khanzada and associates had fibroadenoma as most common BBD.¹⁸ The variation may be attributed to the difference in inclusion criteria in both studies, being mastalgia alone with exclusion of palpable lesion in this study while any presenting complaint in Khanzada report, because fibroadenoma is normally present as a palpable lesion.

Muhammad AA has accredited increased caffeine intake and more females who are married and have history of lactation in our population as a cause of increased incidence of duct ectasia in our population.¹⁹

This study has demonstrated the mean age of patients presenting with mastalgia to be 31 years. In correspondence with this a study conducted by other researchers the age ranged between 30.3 and 39.8 years in local reports on patients presenting with mastalgia.^{20,21} In this study, right sided breasts (30.6%) were involved more with mastalgia than left side (24.6%). In contrast, a regional study demonstrated left sided breasts (32.84%) to be involved more with mastalgia than left ones.²²

Our study has also reported a large percentage of non-lactational breast abscesses. This is possibly due to increased prevalence of diabetes mellitus in our population, Pakistan being ranked as having highest diabetes rate at 30.8% in 2023. Non-lactational breast abscess has been established as an early indicator of this disease.²³

CONCLUSION

Benign breast diseases remain the most common cause of mastalgia in the local population, with duct ectasia being the most common cause in second and third decade followed by fibroadenoma. This knowledge may

help in giving a confident diagnosis on sonography alone and reducing further investigations, thus overcoming delay in the diagnosis and management of the patient. It will help to reduce patient burden on the healthcare facility.

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