

The role of breast ultrasound in assessing patients with mastalgia in Erbil, Iraq

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Abstract

Background and objective: This study aims to determine the role of breast ultrasound in assessing patients with localized or diffuse pain in the breast.

Methods: This cross-sectional study involved 170 women with the mean age of 31 years presenting with breast pain who were referred to the Radiology Department of the Maternity and Rizgari Teaching Hospitals from October 2008 to September 2009. The breasts of each woman were examined by ultrasound scan with special attention was focused on the milk ducts. The presence and the width of the ducts were documented. Each woman was asked for pain intensity and breast pain intensity evaluated as mild, moderate and severe.

Results: The ultrasonic assessment of the affected breast classified the participants into 4 categories; normal (29.9%), tubular (18.6%), ductasia (18.6%) and mass (32.8%). Among the 58 participants having mass in the breast, 48.3% had cystic mass and 51.7% had solid mass. The ultrasonic features of the mass showed that 86.2% of cases were benign and 13.8% were intermediate. The histopathological assessment of the masses shown that 46.4% were fibrocystic changes, 20.7% were fibroadenoma, 24.1% were benign cysts, 3.4% were malignancies and 5.2% were breast infections.

Conclusion: The study results show that duct ectasia is a major factor in determining the severity of mastalgia with no significance difference between cyclical and non-cyclical mastalgia.

Keywords: Mastalgia, ultrasound, breast mass.

Introduction

Breast pain, synonymous with mastalgia or mastodynia, is a very common condition in female. Mastalgia, or breast pain, was described in the medical literature as early as 1829. Pain is one of the most common breast disorder experienced by women¹. Breast pain is a frequent symptom for which women seek medical attention and causes significant anxiety to patient². Clinically there are two types of breast pain: cyclical that waxes and wanes with the menstrual cycle and appears to be hormonal dependent in origin, and the other is a non-cyclic pain³. The underlying physiology may be different for non-cyclic and cyclic breast pain⁴. Breast pain has also been classified to three types; cyclical, noncyclical and

some extra-mammary pain usually associated with inflammation of the chest wall⁵. Cyclical mastalgia is commonest in premenopausal women, whereas non-cyclic mastalgia is commonest in postmenopausal women⁶. The etiology of cyclical mastalgia has not been established. Non-cyclic mastalgia is usually unilateral, described as sharp or burning, and more localized in the breast. Diffused breast pain (unilateral or bilateral) is often treated on clinical grounds because of the extremely low likelihood that diffuse breast pain (without additional signs or symptoms) is a sign of cancer. However, focal breast pain even without additional signs or symptoms is usually evaluated to exclude underlying breast disease^{7,8}. Ultrasonography is

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usually used alone to evaluate focal breast pain in younger women and as an adjunct to mammography in older women. Breast imaging is tailored to the age of the patient, risk for breast cancer, and other aspects of the clinical presentation⁸. The role of ultrasound in assessing mastalgia has not been studied in Erbil context, therefore, this study aims to determine the role of breast ultrasound in assessing patients with localized or diffuse pain in the breast, in the absence of palpable lump or history of breast cancer.

Methods

This study was conducted at Radiology Department of Maternal and Rizgary Hospitals in Erbil. It included women with painful breast(s) as the sole presenting symptom. A total of 191 premenopausal women, referred by general practitioners or breast surgeon specialists to the Radiology Department of Maternity and Rizgary teaching hospitals from October 2008 to September 2009 for breast cancer screening were included in the study. Women between the ages of 14-60 years presenting with breast pain were included in the study. Patients with palpable lump in the painful breast or with history of breast cancer or breast augmentation or patients receiving antidepressant or antihypertensive drugs were excluded from the study. Ten patients had undergone prior breast surgery and need follow up. Four patients were excluded because of concurrent use of antidepressants or analgesics. The remaining 177 patients participated in the study. They were not receiving any regular medication or special diet. Parity and use of hormonal contraception was documented. Each woman was given an ultrasound scan to rule out a non-palpable tumor. Special attention was focused on the milk ducts. All four quadrants of the breast and the retroareolar region were imaged systematically, and the presence and the width of the ducts were documented. After this examination, each woman was asked for pain intensity and breast pain intensity evaluated as mild,

moderate and severe. Mild Pain was recorded as tolerable, moderate pain relieved by medication and severe breast pain interfere with daily works and not relieved by medication. After judging the pain as cyclic or non-cyclic according to pre-established criteria⁹. The patients were asked about recent typical symptoms of duct ectasia and periductal mastitis, such as nipple discharge, non-lactational infection, nipple retraction, and breast lump, and about smoking habits. Patients with breast pain, ultrasound scan was done and correlate the site of the pain with the other site. Grayscale ultrasonography was performed using 7.5 MHZ probe on Siemens G20 machine. Ultrasonography was performed in all patients. This instrument can focus on different depths of the breast. Large breasts and small breasts could be examined with the same precision. The ultrasound scans were exclusively done by an experienced radiologist. The radiologist asked the patient to pin point-out the painful area to ensure that the painful area was included in the standard views. The radiologist also physically examined the breast after reviewing the clinical information, before ultrasonography procedure. The ultrasound findings were carried out in every patient with mastalgia. Main outcome measure was presence of abnormal radiological findings where some of them proved by histopathology findings. Statistical analysis included descriptive statistics where the mean \pm SD of age, numbers and percentage calculation for normal and abnormal findings were carried out. The purpose and importance of the study were explained to each patient. Patients' verbal consents were obtained and their anonymities were maintained at all stages of the study.

Results

The age \pm sd of the participants was 32.5 \pm 7.7 years (range 14 to 60 years). Majority of participants were in the age group 31-40 years (47.5%) and 21-30 years (29.9). Around 89% of them were married

while 11.3% were single. Majority of them had 3 children (31.1%) and 2 children (26%). Details of sociodemographic characteristics of the participants are shown in Table 1.

Table 1: Sociodemographic characteristics of study participants:

Characteristic	No.	%
Age group (years)		
≤20	13	7.3
21 – 30	53	29.9
31 – 40	84	47.5
41 – 60	27	15.3
Marital status		
Single	20	11.3
Married	157	88.7
No. of children		
0	3	1.7
1	19	10.7
2	46	26.0
3	55	31.1
4 & more	34	19.2

Ninety three participants (52.5%) had cyclical breast pain while 84 participants (47.5%) had non-cyclical breast pain. The pain was on the right side in 32.8% of participants, in left side in 36.7% and bilateral in 30.5%. The pain was mild in 58.2% of participants, moderate in 30.5% and severe in 11.3%. Table 2 shows the characteristics of breast pain in the study participants.

The ultrasonic assessment of the affected breast classified the participants into 4 categories; normal (29.9%), tubular (18.6%), ductasia (18.6%) and mass (32.8%) Figure 1. Among the 58 participants having mass in the breast, 48.3% had cystic mass and 51.7% had solid mass. The mass was on the right side in 36.2%, in left side in 29.3% and bilateral in 34.5%. The ultrasonic features of the mass showed that 86.2% of cases were benign and 13.8% were intermediate. Table 3 shows the results of ultrasonic examination of breasts with masses.

Table 2: Characteristics of breast pain in the study participants:

Characteristic	No.	%
Type of pain		
Cyclical	93	52.5
Non-cyclical	84	47.5
Side of affected breast		
Right	58	32.8
Left	65	36.7
Bilateral	54	30.5
Severity of pain		
Mild	103	58.2
Moderate	54	30.5
Severe	20	11.3

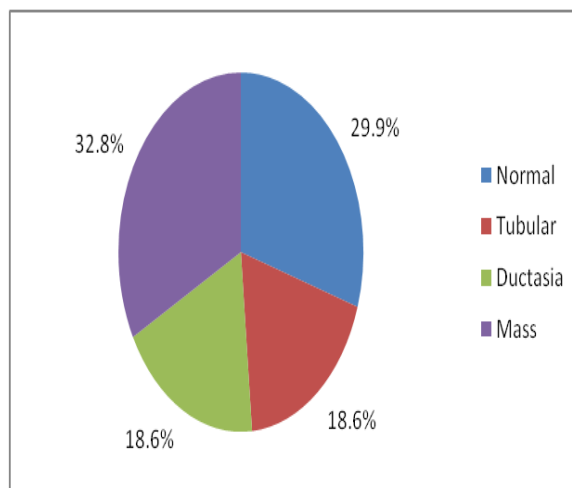


Figure 1: Findings of ultrasonic examination of the affected breast

Table 3: Findings of ultrasonic examination of breasts with masses

Mass type (n=58)		
Cystic	28	48.3
Solid	30	51.7
Mass side		
Right	21	36.2
Left	17	29.3
Bilateral	20	34.5
US feature		
Benign	50	86.2
Intermediate	8	13.8

The histopathological assessment of the masses shown that 46.4% were fibrocystic changes, 20.7% were fibroadenoma, 24.1% were benign cysts, 3.4% were malignancies and 5.2% were breast infections. Figure 2 shows the results histopathological examination of breasts with masses.

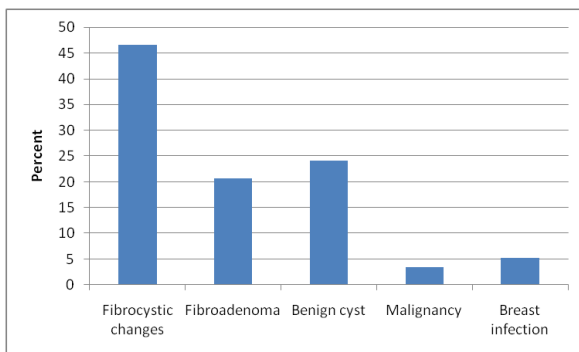


Figure 2: Findings of histopathological examination of breasts with masses.

Presence of mass was more common among the women aged 31-40 years (39.3%), non-married women (50%), women having 3 children (38.2%) or no children (33.3%), non-breast feeding women (32%). However, these associations were not statistically significant. Details of association between presence of breast mass and different demographic characteristics of participants are shown in Table 4.

Table 4: Association between presence of breast mass and different demographic characteristics

Characteristic	No.	Mass		P value
		No.	%	
Age group				
≤20	13	3	23.1	0.197
21 – 30	53	17	32.1	
31 - 40	84	33	39.3	
41 - 60	27	5	18.5	
Marital status				
Single	20	10	50.0	0.081
Married	157	48	30.6	
No. of children				
0	3	1	33.3	0.171
1	19	4	21.1	
2	46	13	28.3	
3	55	21	38.2	
4 and more	34	9	26.5	

Discussion

Breast ultrasound has become a popular imaging modality for the evaluation of breast diseases including breast pain¹⁰. Breast diseases cause considerable morbidity and breast pain particularly with palpable breast masses potentially pose serious concerns prompting immediate evaluation especially in the era of breast cancer¹¹. In Kurdistan region, Iraq ultrasound services have been widely introduced across the region at a relatively inexpensive cost compared to other investigations. Therefore due to the accessibility of these ultrasound services, they form a vital role in evaluating breast diseases. The incidence of breast mass among women presenting with breast pain was relatively high in this study. Another study has shown that 15% of women with operable breast cancer reported having breast pain, while 16% were presented with mastalgia alone¹². The highest incidence of breast lumps was relatively higher in women of reproductive ages which finding is comparable to other studies from other countries^{11,13}. This is also comparable to the findings reported by

other studies^{14,15}. Breast carcinoma was histologically diagnosed in three cases of which ultrasound had reported 8 cases as intermediate malignancy features. The overall sensitivity of ultrasound ranges from 52 to 57.1%¹⁵⁻¹⁷. However, the sensitivity of ultrasound in classifying breast masses as indeterminate or malignant is reported to be 98.4%¹⁸. This therefore means that sonography is a useful imaging modality in giving important clues about breast masses as either being benign or malignant, thus could be used as an initial investigation that could guide other subsequent investigations. This study showed that benign masses were more readily diagnosed by ultrasound than malignant masses. This finding agrees with that reported by other studies that showed a sensitivity ranging from of 81.8% to 89%^{17,19}. This means therefore that ultrasound is more likely to predict benign masses correctly than malignant masses. However, it appears like the most significant role of ultrasound in the differentiation of cystic masses from solid masses¹⁹. From the findings in this study as well as findings from previous studies, it can be concluded that ultrasound plays a significant role in evaluating breast pain. This means therefore that ultrasound use should be considered in most cases of breast pain as an initial investigation particularly in women of reproductive age since it is more accessible and relatively cheaper most notably in developing countries like Iraq. In many communities, mammography is expensive and found only in few areas; therefore, sonography can be used early enough to evaluate any suspicious case. Even in areas where mammography is accessible and people can afford, still breast ultrasound should be used as an adjunct to mammography which would make the final outcome even better since the two are complimentary. One major benefit of ultrasound is to directly relate the physical examination findings with real time imaging results. From this study, ultrasound has been found to be useful as well in characterizing palpable breast masses

as well as detecting suspicious masses that could be malignant. If utilized, ultrasound may play a vital role in detecting malignant breast masses early enough before metastasizing and thus reduce mortality from breast cancer. As the negative predictive value of Ultrasound imaging for breast malignancy is high, it may reassure women with low-suspicion palpable findings²⁰.

Conclusion

In conclusion, ultrasound is a relatively inexpensive and a more accessible modality for evaluating breast pain. It should be the first line investigation especially in women under the age of 35 years and as an adjunct to mammography over the age of 35 years when mammography is available. In areas where mammography is not accessible or very expensive especially in developing countries, ultrasound may be used as a primary modality to further evaluate a breast pain and for ultrasound guided procedures. Even in the presence of mammography, breast sonography should be included in the work-up of symptomatic breast disease.

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