

Ultrasonic evaluation of milk duct dilatation in mastalgia in Erbil, Iraq

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Abstract

Background and objective: As the etiology of mastalgia is poorly understood this study applied ultrasonography to mastalgia patients with the aim of analyzing the significance of milk duct dilatation in patients with mastalgia.

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 mean±SD diameter of duct was 3.99±1.37 mm. The mean diameter of the duct was higher among the younger age group of <25 years than older age groups (4.28 vs 3.95 and 3.87), among married than singles (3.99 vs 3.90) and among those having cyclic pain compared to those having non-cyclic pain (4.0 vs 3.95). However, these differences were not statistically significant. The mean diameter of the duct was significantly higher among those having bilateral pain than those having unilateral pain (4.47 for bilateral vs 4.02 for left side and 3.61 for right side) and among those having severe pain compared to those having moderate or mild pain (4.91 vs 3.40 and 3.28).

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, duct ectasia, ultrasound, Erbil.

Introduction

Mastalgia or breast pain is a very common condition in female¹ and constitutes one of the most common breast disorders experienced by women²⁻⁴. Mastalgia is a frequent symptom for which women seek medical attention and can cause significant patient anxiety⁵. Mastalgia is clinically divided into three types; cyclically, non-cyclical, Tietze syndrome⁶. Cyclic mastalgia accounts for approximately two thirds of breast pain and is commonest in premenopausal women. It typically waxes and wanes with the menstrual cycle and appears to be hormonal dependent in origin^{7,8}. Cyclic mastalgia typically

presents during the third or fourth decade of life. The symptoms tend to persist with a relapsing course. Remission often occurs with hormonal events such as pregnancy or menopause. Only 14% of women with cyclic mastalgia experience spontaneous resolution; however, 42% experience resolution at menopause⁷. The cause of cyclical mastalgia is unknown. Histopathology also cannot detect any distinctive characteristic⁹⁻¹⁰. Non-cyclic mastalgia involves constant or intermittent pain that is not associated with the menstrual cycle. It is less common than cyclic mastalgia and accounts for approximately 31% of women

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seen in mastalgia clinics⁷. Non-cyclic mastalgia is in postmenopausal women⁸. Typically, non-cyclic mastalgia presents at a later age as most women are in the fourth or fifth decade of life at diagnosis¹¹⁻¹². Many women are postmenopausal at onset of symptoms. Most non-cyclic breast pain arises for unknown reasons, yet it is believed more likely to have an anatomical cause¹³. As the etiology of mastalgia is poorly understood this study applied ultrasonography to mastalgia patients with the aim of analyzing the significance of milk duct dilatation in patients with mastalgia.

Methods

This cross-sectional study involved 170 women with painful breast as the sole presenting symptom who were referred by general practitioners or breast surgeon specialists to the Radiology Department of the Maternity and Rizgari Teaching Hospitals from October 2008 to September 2009 as part of breast cancer screening program in Erbil. Any patients who had a palpable lesion in the painful breast was excluded, as were patients with history of breast cancer or breast augmentation or patients receiving antidepressant or antihypertensive drugs. 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 Preece and colleagues⁶, 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 doppler ultrasonography was performed using 7.5 MHZ probe on SIMENS G20. 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 method successfully imaged the milk ducts in different parts of the breast. In some cases, a special maneuver or conformational change to the breast was necessary of the dilated ducts sites. The lower threshold of this ultrasound technique in detecting a milk duct was a dilatation of more than 0.4 mm. In each patient, the milk ducts were identified, and their maximum width was evaluated. The ultrasound scans were exclusively done by one person. 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. The main outcome measure was presence of abnormal radiological findings with histopathological confirmation. Data were entered in MS Excel and descriptive statistics for age and frequency of finding and symptoms were calculated along with measures of central tendency. Statistical analysis was done for descriptive statistics. Mean±SD of age, numbers and percentage calculation for normal and abnormal.

Results

The mean±SD age of the study participants was 31.8±6.9. The majority were married (97.1%) and were in the age group 26-35 years (50%) as shown in Table 1. The majority of the participants had cyclic mastalgia (64.7%) and the pain was mainly on the right side (47.1%). Severe type of pain (41.2%) was more common, followed by moderate (32.4%) and mild (26.5%). Details of mastalgia among study

participants are shown in Table 2. The mean±SD diameter of duct was 3.99±1.37 mm. The mean diameter of the duct was higher among the younger age group of <25 years than older age groups (4.28 vs 3.95 and 3.87), among married

than singles (3.99 vs 3.90) and among those having cyclic pain compared to those having non-cyclic pain (4.0 vs 3.95). However, these differences were not statistically significant. The mean diameter of the duct was significantly higher among those having bilateral pain than those having one side pain (4.47 for bilateral vs 4.02 for left side and 3.61 for right side) and among those having severe pain compared to those having moderate or mild pain (4.91 vs 3.40 and 3.28). The details of association of mean duct with different characteristics of the study participants are shown in Table 3.

Table 1: Characteristics of the respondents

Characteristic	No.	%
Marital status		
Single	5	2.9
Married	165	97.1
Total	170	100.0
Age group (years)		
<25	30	17.6
26-35	85	50.0
≥36	55	32.4
Total	170	100.0

Table 2: Details of mastalgia among study participants

Pain characteristic	No.	%
Type of mastalgia		
Cyclic	110	64.7
Non-cyclic	60	35.3
Total	170	100.0
Side of pain		
Right	80	47.1
Left	30	17.6
Bilateral	60	35.3
Total	170	100.0
Severity of pain		
Mild	45	26.5
Moderate	55	32.4
Severe	70	41.1
Total	170	100.0

Table 3: Details of association of mean duct with different characteristics of the study participants.

Character	No.	Mean	SD	P value
Age group (years)				
<25	30	4.28	1.31	0.401
26-35	85	3.95	1.32	
≥36	55	3.87	1.47	
Total	170	3.99	1.37	
Marital status				
Single	5	3.90	0.01	NA
Married	165	3.99	1.39	
Total	170	3.99	1.37	
Type of pain				
Cyclic	110	4.00	1.60	0.805
Non-cyclic	60	3.95	0.79	
Total	170	3.99	1.37	
Side of pain				
Right	80	3.61	0.89	<0.001
Left	30	4.02	1.06	
Bilateral	60	4.47	1.83	
Total	170	3.99	1.37	
Severity of pain				
Mild	45	3.28	0.63	<0.001
Moderate	55	3.40	0.96	
Severe	70	4.91	1.49	
Total	170	3.99	1.37	

Discussion

The milk ducts of the breast have been neglected by clinicians in the evaluation of breast symptoms and disorders for a long time. It was believed that the milk ducts remained asymptomatic unless they had been distended during lactation or inflammation as in duct ectasia with periductal mastitis and breast infection. In most women, it is possible to image the milk ducts with modern sonographic techniques even if they are not distended¹⁴. Normal measurements for the diameter of a milk duct are not clearly defined. Regarding the histological criteria of duct ectasia with periductal mastitis, milk ducts with a diameter of roughly 3 mm are generally described as fulfilling the definition¹⁵. A cutoff value of 3 mm as a criterion for defining a dilated duct is not clinically feasible. Most asymptomatic women have duct widths below this value, and most symptomatic patients have widths above it. Statistically, a threshold of maximum ductal dilatation that predicts breast pain cannot be evaluated¹⁴. The study indicates that dilatation of the milk ducts from a certain degree onward does indeed produce breast pain in non-lactating women. Regarding symptomatic mastalgia, duct ectasia is a major factor in this disorder, both for cyclical and non-cyclical mastalgia with no significant difference between them. Another study revealed that duct ectasia is a major factor in nearly exclusively all noncyclical mastalgia, and it affects at least one third of the patients with cyclical mastalgia¹⁴. The reason milk ducts are dilated in patients with mastalgia is unknown; however, theoretical association with prolactin level in the body has been reported with having distinctly separate causes of cyclical and non-cyclical mastalgia¹⁶. Whatever the cause of distended milk ducts is, their manifestation is correlated with pain, as documented in this study. Milk ducts are known to be sensitive to pain. Every breastfeeding mother describes discomfort or pain of the filled breast before letting the child suckle. Breast

engorgement during lactation can also be extremely painful. Therefore, the dilated milk ducts described by this study are most likely to be the origin of the pain, which is mediated by sensory nerve endings accompanying the blood vessels¹⁷.

Conclusion

In conclusion, these 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.

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