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Clinical outcome and USG findings of patients presented with breast pain

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Abstract

Introduction: Breast pain can have various causes. Some of these causes can be related to the menstrual cycle, but other causes include infection, cysts, and hormonal therapy. Cyclical breast pain is often caused by the natural menstrual cycle.

Objective: To determine the clinical outcome and ultrasound findings of patients with chest pain.

Methods: A prospective, descriptive, cross-sectional study was conducted in the department of Surgery Cox's Bazar Medical College Hospital, Cox's Bazar, Bangladesh from January to June 2023. A total of 100 patients were included in the study. Patients aged 15-60 years who did not have a clinically palpable mass were included in the study. A detailed medical history was recorded considering especially age, duration of symptoms, height, menstruation, marital status, parity, lactation, nipple discharge and tenderness. The intensity of pain was classified as mild, moderate or severe. In all cases, ultrasound examination of the breast including the axilla was performed and findings were recorded to correlate with clinical features.

Results: Out of 100 patients studied, the mean age of the patients was 34.5 ± 23.75 years (range: 16 to 60 years). Most patients were in the age group 21-30 years (50%) followed by (31-40 years) (35%) respectively. 65 (65%) were married and 35 (35%) were single. 23 patients had 1 child, 20 had 2 children with 8 of them having no children. USG examination of the affected breast and axilla are found normal study in 50 (50%) patients, duct ectasia in 14 (14%), multiple small cystic lesions in 10 (10%), fibroadenosis in 10 (10%) patients. Heterogenous ectagenecity with probe tenderness in 5 (5%), Hypochoeic demarcated nodules 5 (5%) and fibroadenosis in 4 (4%) and enlarged axillary lymph node 2 (2%) respectively. The pain was on right side in 45 (45) patients, 40 (40) on the left and bilateral in 15 (15) patients. The intensity of the pain was mild in 64 (64), moderate in 32 (32), and severe in 4 (4), patients according to visual analog scoring (VAS) system. Mass was more frequent in females aged 21-30 years (50%), married females (65%) and females with 2 children (35.3%). These correlations were not statistically significant.

Conclusion: Ultrasonography is relatively not costly and highly accessible technique for assessing breast pain. The majority of patients with breast pain without clinically palpable lump had normal USG study. But it also detects other early changes in the breast tissue. It can be used as a baseline investigation for any breast pain without palpable lump.

Keywords: Breast pain, breast cancer, USG findings, lymph nodes

Introduction

Breast pain can have many different causes. Some of these causes are related to the menstrual cycle, but other causes include infections, cysts, and hormone therapy. Cyclical breast pain is often caused by the natural menstrual cycle. Recently, breast-related diseases have been gaining attention. One of these diseases is breast cancer. According to the World Health Organization (WHO), breast cancer is one of the most common cancers in women, affecting approximately 2.1 million people each year and causing the highest number of cancer-related deaths in women [1]. Other breast diseases include breast hypertrophy, radioactive scars, breast cysts, fibroadenomas, intraductal papillomas, sclerosing adenosis, and phyllodes tumors [2]. Some of these breast diseases cause pain in the early stages, while others are painless. Therefore, frequent breast examinations are necessary to aid in early detection of such diseases, especially those that are painless in the early stages [3]. The etiology of chest pain is multifactorial. It may be due to normal cyclical changes in hormone levels, or to certain diseases [4]. It may therefore be cyclic or acyclic, with the highest incidence occurring between the ages of 35 and 45 [5].

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Two-thirds of patients with true mastalgia experience cyclical breast pain. These are influenced by hormonal changes during the menstrual cycle and usually worsen during the last week of the cycle and subside when menstruation begins. Pharmacological hormonal agents may worsen the symptoms. Factors such as caffeine, iodine deficiency and dietary fat intake are suspected, but the association has not been clearly proven [6]. Non-cyclical mastalgia accounts for approximately one third of true mastalgia patients [4]. They do not follow the menstrual pattern. Possible causes include large, sagging breasts, breast cysts, pregnancy, thrombophlebitis, trauma, and previous breast surgery [7]. Inflammatory conditions such as mastitis (lactating and non-lactating) and breast abscess are painful and cause characteristic changes in the breast that can be seen on examination: erythema, induration, swelling, and localized pain [7]. Inflammatory cancers can cause similar symptoms, but are characteristically painless and are not cured by antibiotic treatment. Breast ultrasound is one of the most comfortable, painless, readily available, and cost-effective examinations that can be performed on women with breast pain [8]. There are many different types of breast examinations. The most common is breast self-examination (BSE). BSE is a well-known technique used to examine breast tissue for palpable or visible changes. It is often used as an early detection method for breast cancer/breast tumors [9]. The BSE technique was developed over 67 years ago from an idea from a division of the American Cancer Society and has become the recommended standard for many medical professionals [10]. For economic and other reasons, BSE has been a crucial and easily accessible technique for people who do not have access to clinical breast examination (CBE), which is usually performed by a physician [6,7].

Materials and Methods

A prospective, descriptive, cross-sectional study was conducted in the department of Surgery Cox's Bazar Medical College Hospital, Cox's Bazar, Bangladesh from January to June 2023. A total of 100 patients were aged 15-60 years who did not have a clinically palpable mass were included. A detailed medical history considering especially age, duration of symptoms, height, menstruation, marital status, parity, lactation, nipple discharge and tenderness will be recorded. Pain intensity was classified as mild, moderate and severe. Clinical findings related to tenderness and affected quadrant will be recorded. All cases then underwent ultrasound examination of the affected breast, including the axilla.

Each patient underwent an ultrasound scan to exclude nonpalpable masses. All four quadrants of the breast and the retroareolar area were systematically examined. After ultrasound imaging, each patient was asked to rate their pain intensity, and the severity of their chest pain was classified as mild, moderate, or severe. Mild pain was defined as tolerable, moderate pain as relieved by treatment, and severe pain as interfering with daily activities but not relieved by treatment. Pain was classified as cyclic or non-cyclic. Ultrasound scans correlated the pain site with other sites. Patients pointed to the painful site to confirm that the standard image examined the painful site. Main outcome findings were abnormal radiological findings as some of them were correlated by histopathology findings. Statistical analysis included descriptive statistics for normal and abnormal findings. P value was considered statistically significant if it was <0.05.

Results

Out of 100 patients studied, the mean age of the patients was 34.5±23.75 years (range: 16 to 60 years). Most patients were in

the age group 21-30 years (50%) followed by (31-40 years) (35%) respectively. 65 (65%) were married and 35 (35%) were single. 23 patients had 1 child, 20 had 2 children with 8 of them having no children. Out of 100 patients only 3 attained menopause, rest of them have their monthly cycles.

Table 1: Demographic distribution of study patients

Variable	Number	Percentage
Age		
16-20	10	10.0
21-30	50	50.0
31-40	35	35.0
41-60	05	5.0
Marital Statue		
Married	65	65
Unmarried	35	35
No. of Children		
No Children	08	12.3
1-Children	20	30.7
2-Children	23	35.3
3-Children	10	15.3
4-And above	4	6.15

Table 2: Ultra Sound findings of the affected breast

Findings	Numbers of Patients	Percentage
Normal	50	50.0
Duct Ectasia	14	14.0
Multiple Small Cystic Lesions	10	10.0
Fibroadenosis	10	10.0
Heterogonous Ectagenecity with Probe Tenderness	5	5.0
Hypochoeicdemarcated Nodules	5	5.0
Fibroadenosis	4	4.0
Enlarged Axillary Lymph Node	2	2.0

Table-2 shows that the USG examination of the affected breast and axilla are found normal study in 50 (50%) patients, duct ectasia in 14 (14%), multiple small cystic lesions in 10 (10%), fibroadenosis in 10 (10%) patients. Heterogonous ectagenecity with probe tenderness in 5 (5%), Hypochoeic demarcated nodules 5 (5%) and fibroadenosis in 4 (4%) and enlarged axillary lymph node 2 (2%) respectively. Those patients with mass lesions were further subjected to FNAC but no malignancy was detected. FNAC of axillary lymph nodes showed non-specific reactive Lymphadenitis.

Table 3: Characteristics of breast pain in the study

Characteristics	Number	Percentage
Type of Pain		
Cyclical	60	60
Non-cyclical	40	40
Side affected		
Right	45	45
Left	40	40
Bilateral	15	15
Severity of Pain		
Mild	64	64
Moderate	32	32
Severe	4	4.0

In this study out of 100 patients, 60 (60) patients had cyclical breast pain and 40 (40) had non-cyclical breast pain. The pain was on right side in 45 (45) patients, 40 (40) on the left and bilateral in 15 (15) patients. The intensity of the pain was mild in 64 (64), moderate in 32 (32), and severe in 4 (4), patients

according to visual analog scoring (VAS) system (Table 3).

Table 4: Breast mass correlation with demographic parameters

Variable	Mass		p-value
	N	%	
Age			
16-20	10	10%	>0.05
21-30	50	43%	
31-40	35	40%	
41-60	05	6.6%	
No. of Children			
No Children	08	12.3	>0.05
1-Children	20	30.7	
2-Children	23	35.3	
3-Children	10	15.3	
4 And Above	4	6.15	
Marital Statue			
Married	65	65	>0.05
Unmarried	35	35	

Mass was more frequent in females aged 21-30 years (50%), married females (65%) and females with 2 children (35.3%). These correlations were not statistically significant (Table-4).

Discussion

Breast ultrasound is a common imaging modality for evaluating breast diseases such as breast pain [11]. Breast diseases cause significant morbidity, and breast pain, especially palpable breast lumps, poses problems that require special investigation for breast cancer [12]. In most women who undergo imaging for breast pain, mammograms and ultrasounds are completely normal (75-88%). Radiologists find a benign cause of pain in about 10% of women. The most common benign cause of pain is a breast cyst. Ultrasound is relatively inexpensive and accessible compared to other tests. It plays an important role in the evaluation of breast disease. In this study, the frequency of breast lumps in women with breast pain was relatively high. The frequency of breast tumors was higher in women of childbearing age, which is comparable to other studies [13]. Out of 100 patients studied, the mean age of the patients was 34.5 ± 23.75 years (range: 16 to 60 years). Most patients were in the age group 21-30 years (50%) followed by (31-40 years) (35%) respectively. 65 (65%) were married and 35 (35%) were single. 23 patients had 1 child, 20 had 2 children with 8 of them having no children. Out of 100 patients only 3 attained menopause, rest of them have their monthly cycles. With each passing year of menopause, the risk increases by almost 3.5%. Women who reach menopause at 55 years of age instead of 45 years of age have a higher risk of about 30%. Ultrasound examination can be used as a first-line test to guide further testing thereafter. Our study shows that benign nodules are easier to diagnose by ultrasound scanning than malignant nodules. This conclusion was reached by Mansoor T and Fleischer AC *et al.*, who showed a sensitivity between 81.8% and 89% [14, 15]. Ultrasound examination is becoming more accurate in predicting benign nodules than malignant nodules. The most important role of ultrasound examination is to distinguish between cystic and solid nodules [16]. In this study, most women reached menopause after the age of 45 years. In our study, there were more postmenopausal patients (66.7% (20 patients)) than premenopausal (33.3% (10 patients)). A similar profile is seen in the series by Karlsson N YA *et al.* [17, 18]. In the study by Sandhu DS *et al.* [19], 44.27% of patients were premenopausal and 55.76% were. Compared to Western countries, the proportion of

premenopausal patients in this study was low. Younger age at first full-term pregnancy is inversely associated with the risk of breast cancer [20]. Ultrasound scanning plays an important role in the evaluation of chest pain. In case of breast pain, ultrasound should be used as the primary examination in most cases, especially for women of childbearing age, as ultrasound is easily available and relatively inexpensive, especially in developing regions. Mammography is expensive and is only performed in some parts of the Middle East. Ultrasound can be used first to evaluate suspicious cases. Even in areas where mammography is available, breast ultrasound should be used as a complement to mammography to further improve the final results, as both complement each other. Table 2 shows that the USG examination of the affected breast and axilla are found normal study in 50 (50%) patients, duct ectasia in 14 (14%), multiple small cystic lesions in 10 (10%), fibroadenosis in 10 (10%) patients. Heterogeneous echogenicity with probe tenderness in 5 (5%), Hypoechoic demarcated nodules 5 (5%) and fibroadenosis in 4 (4%) and enlarged axillary lymph node 2 (2%) respectively. This association perhaps reflects either a pregnancy induced maturation of mammary cells, and thus making them less susceptible to carcinogenic transformation or a long-lasting hormonal change or both [21]. In this study, it was found that the majority of the women were at an age younger than 30 during their first pregnancy. In this study out of 100 patients, 60 (60) patients had cyclical breast pain and 40 (40) had non-cyclical breast pain. The pain was on right side in 45 (45) patients, 40 (40) on the left and bilateral in 15 (15) patients. The intensity of the pain was mild in 64 (64), moderate in 32 (32), and severe in 4 (4), patients according to visual analog scoring (VAS) system (Table 3). However, information on age at last pregnancy was not available. Older age at last full-term pregnancy has also been associated with an increased risk of breast cancer, although not in all studies [22]. Previous epidemiological studies have generally associated higher parity with a lower risk of breast cancer. Nulliparity has been associated with an overall increased risk of breast cancer. Our study found that many women had breast cancer despite higher parity [23]. There is no clear evidence that reducing the amount of fat, caffeine, or chocolate in the diet reduces breast pain. Vitamin E, thiamine, magnesium, and evening primrose oil are not harmful, but most studies have shown no benefit. Consult your doctor before starting to take any medications or supplements.

Conclusion

Ultrasound is a relatively inexpensive and easily available method to evaluate chest pain. In the majority of patients with breast pain without a clinically palpable mass, ultrasound examination was normal. However, it also detects other early changes in breast tissue. It can be used as a basic test for breast pain without a palpable lump.

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