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An observational study assessing the outcome of sonography and mammography in women with breast pain

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Abstract

Aim: The aim of the present study was to assess the outcome of sonography and mammography in women with breast pain.

Methods: All women with diffuse & focal breast pain referred to the Department of Radiology were included in the study. During the study period, a total of 450 patients underwent Breast Imaging. Pain alone was mentioned as reason of referral in 100 cases (22.22%).

Results: The mean age of patients in the study was 36. 23 (range 17-60 years). 20 patients (20%) had family history of breast cancer and 10 (10%) had history of Hormone use at the time of examinations. The Imaging findings on the painful; breasts were: 70 (70%) normal, 28 (28%) Benign and 2 (2%) had suspicious imaging findings of malignancy. The findings in the rest of the breasts were mild alteration in density and echo texture. FNA cytology examination was suspicious for cancer in 2 patients and 30 was benign. The negative predictive value in our study was 90%.

Conclusion: The primary use of sonography and Mammography in women with breast pain seems reassuring for the patients and clinicians. The primary value of breast imaging in women with painful breasts seems to be that of reassurance, as no abnormalities are usually detected, radiological abnormalities classified as benign do not generally have any clinical consequences, and the prevalence of cancer in a painful area is low.

Keywords: Sonography, mammography, breast pain

Introduction

Breast pain is one of the most common breast symptoms, which leads women to seek a physician consultation ^[1]. It may cause a high level of concern in women for an underlying malignancy. The reported incidence of breast cancer in patients presenting with breast pain is 0% to 3.2% ^[2-4]. Breast pain is generally of two kinds: a cyclical waxing and waning pain, which is usually diffuse, bilateral, and is usually associated with menstrual cycle, and a noncyclical pain, which is usually unilateral and localized. When patients present with breast pain, the physicians generally perform a thorough history and a physical examination to evaluate for any underlying masses. Patients with cyclical diffuse breast pain without a palpable mass are often treated clinically ^[1, 2].

The use of mammography and US in evaluation of a palpable breast lump is well established and has shown a negative predictive value of 99.8-100% ^[5, 6]. Diffuse breast pain is generally considered less concerning compared with focal breast pain. However, in current clinical practice, imaging guidelines for evaluation of breast pain, specifically focal breast pain, is less established. There is inconsistency among various practices regarding the use mammograms and/or US for evaluating these patients.

Recommendation for breast imaging depends on the age of the patient, the nature of breast pain, and the presence or absence of a mass or other findings on physical examination. The evaluation of breast pain varies according to its assignment within the 3 broad classifications of cyclic mastalgia, non-cyclic mastalgia, and extra mammary (non-breast) pain ^[7]. The distinctions are important because the evaluation and the likelihood of response to intervention vary among the different types of breast pain ^[8]. The established management of palpable breast lesions includes the triple assessment of physical examination, mammography, and percutaneous biopsy ^[9].

The aim of the present study was to assess the outcome of sonography and mammography in women with breast pain.

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Materials and Methods

All women with diffuse & focal breast pain referred to the Department of Radiology were included in the study. During the study period a total of 450 patients underwent Breast Imaging. Pain alone was mentioned as reason of referral in 100 cases (22.22%). Patients with pain and associated palpable abnormality were excluded. Pain was defined as focal if it is localized to a specific area & diffuse pain if patient could not localize to a specific area. Mammographic examinations were performed with Senographe 500T (Senix H'F) & the ultrasonographic examination was performed with a 7 MHZ OR 8 MHZ linear array transducer: ASU-3000. All examinations were performed by the first Author who is experienced in both mammography & breast sonography.

Breast imaging consisted of a two view Mammography (cranio-caudal and medio-lateral oblique views) and additional local compression where necessary. Routine focused ultrasonographic examination that was targeted to the area of clinical concern was carried out subsequently to evaluate any non-conclusive mammographic findings in focal or diffuse breast pain when a dense looking mammogram is negative. All sonographic examinations were performed with the patient in the supine position, with her ipsilateral arm raised above her head. The Imaging appearances were classified as normal, benign or suspicious. The breast imaging was considered to be normal if there was no apparent abnormality; benign, when cyst, fibroadenoma, or mastopathy is detected and suspicious, when solid mass with irregularity or not well defined borders were found. Finally, the pathologic examination records of the patients for whom cytologic evaluation were done for breast pain were obtained from central health Laboratory during the study period.

Instrument for data collection was developed and data was extracted from the mammographic information sheet, ultra sound form and FNA results. Age, Address, date of initial visit, educational status, menstrual status, hormone use, family and personal history of breast cancer, specialty of the referring physician, type and site of breast pain, mammography/ultrasound findings and FNA results were the pertinent information obtained.

On the basis of the information we categorized findings as being true negative, false negative, true positive, or false positive and negative predictive value of combined sonography and mammography was calculated. Data was analyzed using SPSS version 12.0.

Results

Table 1: Patient demographics in 100 breast imaging examinations performed for breast pain

| Patient age group | Family History of Breast Cancer | | | | | History of hormone intake | | | | |
|-------------------|---------------------------------|-----|----|-------|-------|---------------------------|-----|----|-------|-------|
| | Yes | | No | | Total | Yes | | No | | Total |
| | N | % | N | % | | N | % | N | % | |
| Below 20 | 3 | 15 | 4 | 5 | 7 | 2 | 20 | 4 | 4.44 | 6 |
| 20 - 29 | 10 | 50 | 30 | 37.50 | 40 | 4 | 40 | 36 | 40 | 40 |
| 30 - 39 | 3 | 15 | 25 | 31.25 | 28 | 3 | 30 | 30 | 33.34 | 33 |
| 40 - 49 | 2 | 10 | 15 | 18.75 | 17 | 1 | 10 | 12 | 13.34 | 13 |
| 50 - 59 | 2 | 10 | 3 | 3.75 | 5 | 0 | 0.0 | 6 | 6.66 | 6 |
| 60 - 69 | 0 | 0.0 | 3 | 3.75 | 3 | 0 | 0.0 | 2 | 2.22 | 2 |
| Total | 20 | 20 | 80 | 80 | 100 | 10 | 10 | 90 | 90 | 100 |

The mean age of patients in the study was 36. 23 (range 17-60 years). 20 patients (20%) had family history of breast cancer and 10 (10%) had history of Hormone use at the time of examinations.

Table 2: Radiological findings in the painful Breast in relation to age groups

| Patient age group | Combined mammography and sonography | | | | | | Total |
|-------------------|-------------------------------------|-------|--------|-------|------------|-----|-------|
| | Normal Breast | | Benign | | Suspicious | | |
| | N | % | N | % | N | % | |
| Below 20 | 7 | 10 | 1 | 3.57 | 0 | 0.0 | 8 |
| 20 - 29 | 26 | 37.14 | 10 | 35.71 | 1 | 50 | 37 |
| 30 - 39 | 22 | 31.42 | 10 | 35.71 | 0 | 0.0 | 32 |
| 40 - 49 | 11 | 15.71 | 5 | 17.85 | 1 | 50 | 17 |
| 50 - 59 | 3 | 4.28 | 1 | 3.57 | 0 | 0.0 | 4 |
| 60 - 69 | 1 | 1.43 | 1 | 3.57 | 0 | 0.0 | 2 |
| Total | 70 | 70 | 28 | 28 | 2 | 2 | 100 |

The Imaging findings on the painful; breasts were: 70 (70%) normal, 28 (28%) Benign and 2 (2%) had suspicious imaging findings of malignancy. The findings in the rest of the breasts were mild alteration in density and echo texture.

Table 3: Pathologic findings in the painful breast in relation to age group

| | Pathology | | | | Total # |
|----------|-----------|-------|------------|------|---------|
| | Benign | | Suspicious | | |
| | N | % | N | % | |
| Below 20 | 7 | 23.34 | 0 | 0.0 | 7 |
| 20 - 29 | 12 | 40 | 0 | 0.0 | 12 |
| 30 - 39 | 5 | 16.66 | 2 | 100 | 7 |
| 40 - 49 | 6 | 20 | 0 | 0.0 | 6 |
| Total | 30 | 93.75 | 2 | 6.25 | 32 |

FNA cytology examination was suspicious for cancer in 2 patients and 30 was benign.

Table 4: Pathology findings Vs Combined mammography and sonography

| Imaging findings | Pathology | | | | Total N |
|---|-----------|-------|------------|------|---------|
| | Benign | | Suspicious | | |
| | N | % | N | % | |
| Negative or benign findings at mammography/sonography in the area of pain | 27 | 90 | 2 | 4.3 | 29 |
| suspicious findings at mammography/sonography in the area of pain | 3 | 10 | 0 | 0.0 | 3 |
| Total | 30 | 93.75 | 2 | 6.25 | 32 |

The negative predictive value in our study was 90%.

Discussion

Sixty Nine percent of healthy women self- referred to breast screening clinics reported pain that was severe enough to interfere with their daily routine [10]. It is the breast symptom that most frequently causes women to seek medical attention and one that causes significant patient anxiety [11]. Cyclic breast pain is the most common type of breast pain, accounting for about two thirds of case. It usually affects women who are in their 30s or 40s. Cyclic breast pain occurs in a pattern clearly related to the menstrual cycle. It usually occurs in both breast and involves the entire breast, particularly the upper, outer portions, extending into the underarm area. Women often describe this type of breast

pain as dull, heavy or aching. It tends to be most intense during the week or two before period and to ease up afterward. Noncyclic is breast pain constant or intermittent breast pain which is not related to menstrual cycle.

The mean age of patients in the study was 36.23 (range 17-60 years). 20 patients (20%) had family history of breast cancer and 10 (10%) had history of Hormone use at the time of examinations. The prevalence of breast cancer in women younger than 40 years is significantly less than that of above 40 years of age [12]. Clinical examination of the breast and assessment of the patient's individual risk for breast cancer should be the main determinant of the need for imaging [13]. In general breast imaging should be tailored to the age of the patient, risk for breast cancer, and other aspects of the clinical presentations. Because of the theoretical risk of radiation, low prevalence of breast cancer and the dense nature of the breast in young women, sonography is often selected as the diagnostic modality in younger women while mammogram should be considered in women with focal breast pain who are aged 30 years or older, have a family History of early breast cancer, or have other risk factors for breast cancer [14]. Ultra sonography should also be considered for focal breast pain in older women as an adjunct to mammography to increase the sensitivity of imaging.

The Imaging findings on the painful breasts were: 70 (70%) normal, 28 (28%) Benign and 2 (2%) had suspicious imaging findings of malignancy. The findings in the rest of the breasts were mild alteration in density and echo texture. The findings by Dui Jim *et al*, [15] & Leung *et al*, [2] where finding showed that 86.5 % and 77.3 % were normal respectively. The benign cysts in this study were small cysts & none of them undergone cyst puncture and fluid aspiration as the natural course of this process is spontaneous regression [16]. In most patients no radiological abnormalities were found in the painful breast(s). The benign findings mainly consisted of small cysts or mastopathy (for example, sclerosing adenosis or microcystic hyperplasia). However, it is doubtful whether pain can be attributed to a nonpalpable cyst a few millimetres in size, and many of these benign lesions will undergo spontaneous regression [17]. Further routine intervention, therefore, is not recommended. In cases where radiologically guided aspiration of nonpalpable cysts is performed, cytological examination is unnecessary if the fluid obtained is not bloody [16].

The negative predictive value of imaging in this study was 90%. Similar to one study in the U.S showed a negative predictive value of 100% [18]. Our study implies that biopsy of the painful area of the breast might not be indicated in patients with imaging findings that are not suspicious of cancer. Nevertheless, in order to come to a solid conclusion there is a need to improve the test characteristic of current ultra sound and mammography diagnosis in the future by introducing ultra sound machines with high resolution and high quality image producing mammography machines. Periodic mammography follow up of lesions classified as benign might be a reasonable alternative to biopsy at this time. This strategy is substantially different from the established management of palpable breast lesions, where biopsy may follow a negative radiology report [19].

Conclusion

The primary use of sonography and Mammography in

women with breast pain seems reassuring for the patients and clinicians. The primary value of breast imaging in women with painful breasts seems to be that of reassurance, as no abnormalities are usually detected, radiological abnormalities classified as benign do not generally have any clinical consequences, and the prevalence of cancer in a painful area is low. As an alternative to referral to a breast surgeon, general practitioners may prefer to refer their patient to a radiologist for mammography. The radiology report can then be used to determine whether the patient needs to see a surgeon.

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