The Use of Sonography and Mammography in the Evaluation of Eritrean Women with Breast Pain.

Mebrahtu Ghebrehiwet, M.D. Radiologist, Orotta National Referral   Hospital

Estifanos Paulos, M.D...Department of pathology, Orotta school of Medicine

Tsighe Andeberhan, M.D., Orotta National Referral Hospital

Correspondence: Dr. Mebrahtu Ghebrehiwet, Radiologist, Orotta National referral Hospital

P.O.Box 2686   email: mebgh2003@yahoo.com

Abstract

Objective: To assess the outcome of sonography and mammography in Eritrean women with breast pain in order to give background information for setting a standard practice of evaluation.

Methods: All women with diffuse or focal breast pain referred to the departments of radiology of Orotta national referral hospital and Selam poly clinic between Jan., 2005 and Dec, 2007 were included. Patients with pain and associated palpable abnormality are excluded from the study. All patients underwent sonography and mammography. Finally, a review of all the pathology reports for breast cytology studies or biopsies was done to identify any interval cancer or false interpretations of the imaging of the subjects.

Results: 470 patients underwent breast imaging during the study period. Pain alone was mentioned as reason for referral in 105 cases (22%). The mean age at presentation was 32.23. 47 (44.8%) were below the age of 30 year. 16 (15.2%) had family history of breast cancer and 11 (10.5%) had history of hormone use at the time of examinations. The pain was unilateral in 76 patients (72.4%). Most (53.3%) of the referrals were made by surgeons. FNA findings showed that 13 patients (52%) have benign mastopathy, 3 (12%) fibro adenoma, 2(8%) benign fibro epithelial alterations and the rest 6 different cytologic diagnosis, including mastitis ,tuberculous lymphadenitis, and non specific inflammatory changes. FNA cytology examination was suspicious for cancer in one patient but this was not histologically confirmed as the patient was lost to follow up. The negative predictive value for mammography and sonography was 95.7%.

Conclusion: The primary use of sonography and mammography in women with breast pain is reassuring to the patients and to the treating clinician.

Introduction

Mastalgia, or Breast pain, was described in the medical literature as early as 1829 and was likely known to medical practitioners much earlier. Pain is one of the most common breast disorders experienced by women (1).

In western societies mastalgia, or breast pain with out underlying pathology, is a common complaint that may affect up to 70 % of women in their life time(2) . Interestingly, it is less common in Asian cultures, affecting as few as 5 %(3). Mastalgia, the most common problem seen in the west, finds little mention in our country.

Sixty Nine percent of healthy women self- referred to breast screening clinics reported pain that was severe enough to interfere with their daily routine(4). It is the breast symptom that most frequently causes women to seek medical attention and one that causes significant patient anxiety (5).

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 after ward. Non-cyclic is breast pain constant or intermittent breast pain which is not related to menstrual cycle.

The evaluation of breast pain usually begins with a thorough history and physical examinations. 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 (1). The distinctions are important because the evaluation and the likelihood of response to intervention vary among the different types of breast pain (6). The established management of palpable breast lesions includes the triple assessment of physical examination, mammography, and percutaneous biopsy (7.) In the absence of palpable mass, mammography is often done in women less than 30 years of age to exclude an occult lesion, although sonography is the modality of choice.

The prevalence of breast cancer in Eritrea among women with breast pain is not known. Doctors often refer patients with a painful breast without palpable lesion for further evaluation by ultrasonography or mammography. There is no standard practice in evaluation of breast pain. The use of mammography and sonography in women with breast pain is not also documented. Therefore, this observational study was conducted to asses the out come of breast imaging in Eritrean women referred for mammography & ultrasonography because of breast pain and also give background information for developing standard practice in terms of breast pain evaluation.

Materials and methods

All women with diffuse & focal breast pain referred to the department of radiology of Orotta national referral hospital and Selam poly clinic between January 2005 and December 2007 were included in the study. 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 (Ultrasound Scanner, May 1999,China,and Sonoline Omnia imaging system, Siemens Issaquah,& WA Ultrasound Imaging System. 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 of the Ministry of Health 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 these 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 version12.0.

Results

During the study period a total of 470 patients underwent Breast Imaging. Pain alone was mentioned as reason of referral in 105 cases (22%).The mean age of patients in the study was 32. 23 (range 17-60 years). 47 (44.8 %) were below the age of 30 years. Sixteen patients 15. 2 % had family history of breast cancer and 11 (10.5 %) had history of Hormone use at the time of examinations.

TABLE 1: Patient demographics in 105 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
	#	%	#	%		#	%	#	%	
Below 20	2	28.6	5	71.4	7	2	28.6	5	71.4	7
20 – 29	8	20.0	32	80.0	40	4	10.0	36	90.0	40
30 – 39	2	6.1	31	93.9	33	4	12.1	29	87.9	30
40 – 49	2	11.1	16	88.9	18	1	5.6	17	94.4	18
50 – 59	2	40.0	3	60.0	5	0	0.0	5	100.	5
60 – 69	0	0.0	2	100.0	2	0	0.0	2	100.	2
Total	16	15.2	89	84.8	105	11	10.5	94	89.5	105

The pain was unilateral in 76 patients (72.4 %) and bilateral in 29 (27.6 %).The type of breast pain was diffuse in 30(28.6%) & focal in 75(71.4%).56 (53.3 %) of the referrals were made by surgeons, 37. (35.2 %) were requested by general practitioners, 7 (6.7%) were requested by Gynecologists and obstetrician.

Ultrasonography was performed in conjunction with mammography in all 105 cases. The Imaging findings on the painful; breasts were: 76 (72.4%) normal, 27 (25.7 %) Benign and 2 (1.9 %) had suspicious imaging findings of malignancy.44.8% of patients with normal findings were below 30 years of age. Out of the benign abnormalities there were six cases of cysts on imaging with less than 1.0 cm in diameter, 3 cases of fibro adenoma less than 1.0cm in sizes, two patients with edema, and two had benign calcification. The findings in the rest of the breasts were mild alteration in density and echo texture.

TABLE 2: Radiological findings in the painful Breast in relation to age group

Patient age group	Combined mammography and sonography						Total
	Normal Breast		Benign		Suspicious		
	#	%			#	%	
Below 20	6	85.7	1	14.3	0	0.0	7
20 - 29	29	72.5	10	25.0	1	2.5	40
30 - 39	24	72.7	9	27.3	0	0.0	33
40 - 49	12	66.7	5	27.8	1	5.6	18
50 - 59	4	80.0	1	20.0	0	0.0	5
60 - 69	1	50.0	1	50.0	0	0.0	2
Total	76	72.4	27	25.7	2	1.9	105

In 25 of the 105 women with normal, benign or suspicious findings in the painful breasts, FNA cytology of the painful area was performed after radiological examinations. The cytological findings showed benign mastopathy in thirteen (52%), fibro adenoma in three

(12%), benign fibroepithellial alterations in two (8%) and one patient(4%)   had intraductal papiloma. In the remaining five (20%) cases the cytology findings ranged from mastitis/ non specific inflammatory changes to TBC lymphadenitis. In one of the patient on whom FNA cytology examination showed cluster of ductal cells with atypia histologic confirmation was not possible.

TABLE 3: Pathologic findings in the painful breast in relation to age group					
	Pathology				Total
	Benign		Suspicious		
	#	%	#	%	#
Below 20	4	100.0	0	0.0	4
20 - 29	10	100.0	0	0.0	10
30 - 39	4	80.0	1	20.0	5
40 - 49	6	100.0	0	0.0	6
Total	24	96.0	1	4.0	25

 The negative predictive value in our study was 95.7%

TABLE 4: Pathology findings Vs Combined mammography and sonography					
Imaging findings	Pathology				Total
	Benign		Suspicious		
	#	%	#	%	#
Negative or benign findings at mammo graphy/sonography in the area of pain	22	95.7	1	4.3	23
suspicious findings at mammo graphy/sonography in the area of pain	2	100.0	0	0.0	2
Total	24	96.0	1	4.0	25

   True positive (TP) = 0; False positive (FP) = 2;
   False negative (FN) = 1;   True negative (TN) = 22
   Negative predicative = TN/ (TN+FN) = 95.7%

The negative predictive value of combined sonography and mammography evaluation in our study was 95.7%

Discussion

In this study it was found that 44.8 % of the patients referred for evaluation of breast pain were younger than 30 years of age. The prevalence of breast cancer in women younger than 40 years is significantly less than that of above 40 years of age (8). From facility based study conducted in Eritrea breast cancer was commonly found in the age group 30-40 (9). 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 (10).

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 (11).Ultra sonography should also be considered for focal breast pain in older women as an adjunct to mammography to increase the sensitivity of imaging.

In this study most (73 %) of the Sonographic and Mammographic examinations done to evaluate focal or diffuse breast pain were negative. The benign findings consisted small fibro adenoma less than 1 cm or less, benign mastopathy and cysts which are smaller than ten mm in size which is similar to the findings by Dui Jim et al (12) & Leung et al(13) 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 (14).

Twenty-five (23.8 %) patients undergone FNA despite negative and benign findings on breast imaging. 24 (96%) of the biopsy results turned out to be benign abnormalities. Only two patients were classified radiologically as suspicious of whom one patient was suspicious for cancer on cytological study but not confirmed on histology, as patient was lost to follow up. In another series out of 939, 10(1%) of women with normal or benign radiological findings in the painful breasts underwent biopsy of the painful area and only one abnormality with fibrocystic disease was found(12). In the same study stereo tactic or ultrasound guided open biopsy was performed in eight patients with suspicious lesions. Histological examination of the specimen showed fibro adenoma in three cases and fibrocystic disease in five.

In Eritrea, in women with breast pain currently the decisions for biopsy seems to depend on clinical suspicion despite negative imaging findings. The negative predictive value of imaging in this study was 95.7 %.Similar to one study in the U.S showed a negative predictive value of 100%(15).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 (16).

In this series the only case who was suspected of cancer with cytological study accounted for about 0.95%.According to study by Dujim et al (12) the total prevalence of breast cancer among 987 patients with breast pain was .8% after 24 months of clinical follow-up. Even though the rate of cancer detection was low, we recognize that this   study has potential limitation in that clinical follow-up of patients was not included.

Conclusion

The primary use of sonography and Mammography in women with breast pain seems reassuring for the patients and clinicians.

Recommendation

1.   In Eritrean setting ultrasound alone can be used to evaluate focal or diffuse breast pain in patients younger than 30 years of age and ultrasound adjunct to mammography in women older than 30   years of age.

2.   Biopsy could be limited for patients with suspicious clinical findings and breast imaging.

3.   Further large scale observational follow up study with imaging and clinical follow up is recommended to   determine the prevalence of breast cancer in a population with breast pain.

Acknowledgement

Reference

1.   Robin L. Smith, Sandhya Pruthi, Lorraine A. Fitzpatrick. Evaluation and Management of breast pain. Mayo Clin proc 2004, 79: 353-372.

2.   Ernster Vi-,Mason I.< Goodson WH 111, Sickles EA, Sacks St, et al effects of caffeine free diet on Benign breast disease: A randomized trial. Surgery 1982, 91(3): 263-7.

3.   Goodwin PJ, Miller A. Del Guidance ME, singer W, Connelly P, Knox Ritchie JW, Elevated High- Density lipoprotein, cholesterol, and dietary fat intake in women with cyclic Mastalgia, American Journal of Obstetric and Gynecology 1998, 179: 430-7

4.   Believe RM. Mastodynia- Obstet Gynecol clin North Am 1994, 21: 461- 477, 1994, 21: 461- 477.

5.   Morrow M., The evaluation of common breast problems, Amer. Family Physician 2000; 61:2371- 2378

6.   Davies EL, Gateley CA, Miers M, Mansel RE The long term course of mastalgia. J R soc Med. 1998; 91:462-464

7.   Tabar L, Pentek Z, Dean PB. The diagnostic and therapeutic value of breast cyst puncture and Pneumocystography, Radiology 1981, 141: 659- 663.

8.   American college of Radiology, Appropriate imaging work-up of palpable breast masses, In: - ACR Appropriateness Criteria.Reston, VA: American college of Radiology, 2000: 961- 964.

9.   Mebrahtu G, Estifanos P, Tsighe A. The role of combined sonography and Mammography in the diagnosis of breast cancer among adult Eritrean women with palpable abnormalities of the breast. J.E.M.A, vol 2, No 1 Dec 2007. pp 2-7.

10. Vera Rosolowich, Elizabeth Saettler, Beth Szuck, mastalgia. January Jogc janvier 2006

11. Feig SA, Ehrlick SM. Estimation of Radiation risk from screening mammography: Recent trends and comparison with expected Benefits. Radiology 1990, 174:638-647

12. Lucien Em duijm, Gerard L. Guit Jan HcL Hendriks, Joost Omzeat, Willem PTM Mali. Value of Breast imaging in women with painful breasts: observational follow up study, BMJ 1998, 317: 1492-1495 (28 November).

13. Leung, JW, Kornguth PJ, Gotway MB. Utility of targeted sonography in the evaluation of focal breast pain Ultrasound Med 2002; 21:521-26

14. Brenner RJ, Bein ME,Sarti DA,Vinstein AL. spontaneous regression of interval benign cyst of breast. Radiology, 1994; 193:365-368.

15.   Lusine Tumyan, Anne C.Hoyt, and Lawrence W. Bassett. Negative   predictive value of sonography and mammography in patients with focal breast pain. The Breast Journal, volume 11 Number 5, 2005,

16.   Warwick DJ, Smallwood JA, Guyer PB, Dew bury KC, Taylor L. Ultrasound Mammography in the Management of breast cancer. Br J Surg 1988, 75: 243-245