Evaluation of Breast Cancer Cases Diagnosed In the Breast Cancer Screening Program In the Near East University Hospital of North Cyprus

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ABSTRACT

Objective: This study is about determination and evaluation of the breast cancer cases which were diagnosed during the early diagnosis and screening programs covering a three years of digital mammography images at the Near East University Hospital.

Materials and Methods: This study covers 2136 women patients who applied to the early diagnosis and screening program of the Near East University Hospital between July 2010 and July 2013. The mamographic images were re evaluated retrospectively according to ACR's (The American College of Radiology) BİRADS (Breast Imaging Reporting and Data System). The mamographic results as required were correlated with breast ultrasound (US) and compared with the pathologic results of materials obtained by surgery or biopsy. The results were analyzed statistically in comparison with the literature data.

Results: The women who were screened aged between 34-73 years with a median of 53.5 (SD = 27.5). Suspected malignancy were evaluated in 54 patients, which 42 of them were diagnosed BIRADS 4 and 12 patients BIRADS 5 and 21 patients were correleted breast cancer based on histopathologic examination. 17 patients had the breast-conserving surgery and 4 patients were treated with mastectomy.

Conclusion: Breast cancers that are detected at early stages by breast cancer screening tests are more likely to be smaller and still confined to the breast resulting in more simple operations and more succesfull treatment. Promoting the breast cancer screening and registration programs in our country will help to control the desease at our region.

Keywords: Mammography, breast cancer, screening program

Introduction

Breast cancer is the most common primary cancer in women, and the second leading cause of death in women after lung cancer (1). Treatment is more successful when diagnosed in early stages by screening methods. Epidemiological studies have shown that advanced age, history of breast cancer in first degree relatives, early menarche, late menopause, late term pregnancy , lack of breast-feeding , obesity, hormone replacement therapy after menaupose are important risk factors for the development of breast cancer. In addition, BRCA 1,2 mutations in familial cases have also been demonstrated (2).

Determining the exact frequency of breast cancer in a country is difficult when there is no regular breast cancer screening and monitoring program, despite individual breast cancer screening practices in various institutions. This study aimed to retrospectively evaluate 2136 women's mammography images, that were obtained over a three year period as part of a breast cancer screening program implemented on 2010, together with additional imaging tests performed if required.

Materials and Methods

In this study, digital mammography images of 2136 cases obtained between 20.07. 2010- 20.07.2013 as part of a screening program (GE Healthcare Senographe Essential Stereotaxy) were evaluated retrospectively. Patients with a mammography from other centers, those who were referred for diagnosis rather than screening, and those who had previous operation due to breast cancer were excluded.

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Table 1. Number of women according to check-up and screening dates. Number of patients diagnosed by radiologic evaluation, BIRADS and histopathologic diagnosis

Parameters	20.07.2010- 20.07.2011 (Case number (n))	20.07 2011- 20.07.2012 (Case number (n))	20.07.2012- 20.07.2013 (Case number (n))
Women applying to check-up and screening programs	1134	581	421
Radiologic Mammography	11	8	13
Patients with suspicious malignancy findings onbilateral breast ultrasonography and mammography	7	9	6
BIRADS-4	13	14	15
BIRADS-5	5	3	4
Histopathology			
Invasive ductal	4	3	4
Invasive lobular	1	-	1
Mucinous carcinoma	1		
DCIS			
Other carcinoma	3	1	3

BIRADS: Breast Imaging Reporting and Data System
DCIS: Ductal Carcinoma in situ
USG: Ultrasonography

An ethical approval was obtained from Near East University Hospital medical research ethics committee, and informed consent was obtained from all participants. All data were coded numerically. Arithmetic mean, standard deviation, number, and percentage calculations were used for analysis. The MMG and USG evaluations were performed according to The American College of Radiology (ACR) Breast Imaging Reporting and Data System (BI-RADS) (3).

Statistical Analysis

The World Health Organization (WHO) International Agency on Research on Cancer (IARC) calculated 460,000 deaths from breast cancer in 182 countries in 2008 (4). Breast cancer incidence shows serious geographical differences. The incidence of 102 / 100,000 in the Northern European countries is decreased to 70 / 100,000 in the south, and to 47 / 100,000 in the east. The breast cancer incidence in countries such as Netherlands, Denmark, Finland and the UK, countries with older female population, less women giving birth and decreased number of births, is very high (92, 86, 78 and 75 in a thousand, respectively), while in some Mediterranean countries with more conservative fertility characteristics and eating habits as compared to other European countries (48 in one hundred thousand in Greece and Spain), the incidence is lower. The 50% reduction in mortality in the United States, which occurred in the last 25 years, is attributed to early diagnosis with screening and effective treatment (5,6).

Results

The age range in our study was 34-73, with a median age of 53.5 years (SD = 27.5). Three women under the age of 40 years underwent mammography due to a family history of breast cancer. Bi-directional (MLO, CC) bilateral MMG images were obtained during routine screening. Additional views were obtained in 143 cases (spot and spot compression magnification) , in addition to bilateral breast and axillary ultrasound in 502 cases.

Seven hundred eighty four women (36%) were premenopausal, while 1352 (64%) were post-menopausal. Eighty percent of women had given birth at least once, and 52.3% of those breastfed their children for at least 6 months.

It was found that 37% of women regularly performed BSE (breast self-exam), 59% did not know how to perform the examination or did not perform, and 4% was reluctant to examine their selves. In our study, 31.8% had family history of malignancy other than breast and 16.4% had family history of breast cancer.

A total of 54 patients (2.5%) (32 MMG and 22 bilateral breast USG) had suspicious findings that may be related to breast malignancy. The age range of these patients was 40-72, with a median age of 56 years (SD = 2.6). Suspicious lesions were as spiculated masses, spiculated masses in 15 out of 32 patients, spiculated mass and microcalcification cluster in 9, only pathological microcalcifications in 3, and radial scar in 5 cases. Eighty six percent of patients with suspicious of malignancy had these findings on mammographic imaging only and 14.3% had suggestive findings on both mammography and bilateral breast ultrasound. Forty-two out of 54 patients with breast lesions were evaluated as BI-RADS 4, and 12 as BIRADS 5, and tissue diagnosis was recommended for these patients. Eighteen BI-RADS 4 cases did not accept any further tests, and were lost to follow-up. Four patients with suspicious findings in terms of malignancy who refused biopsy had stable lesions that are being followed-up. Twenty BI-RADS 4 patients and 12 BI-RADS 5 patients accepted tissue diagnosis.

Ultrasound guided tru-cut biopsy was applied in15 out of 32 cases with a palpable mass on physical examination. There were 17 non-palpable lesions, 14 patients had USG guide-wire insertion, and 3 had MMG guided insertion, followed by excision. All non-palpable lesions that were excised with guide-wire were confirmed by specimen x-ray 8USG or MMG) after excision. Nine BI-RADS 4 patients out of 20 (45%) with tissue diagnosis, and all 12 BI-RADS 5 patients (100%)

were diagnosed with breast cancer on pathologic examination (Table 1). Four patients underwent mastectomy and 17 had breast-conserving surgery. The pathologic evaluation revealed ductal carcinoma in situ in 7 cases, invasive ductal carcinoma in 11, invasive lobular carcinoma in 2, and mucinous carcinoma in 1 case. The rate of breast cancer diagnosed with screening was found to be 0.98%.

Discussion and Conclusion

Mammography and clinical breast examination facilitates the early detection and treatment of breast cancer, and are reliable methods to reduce the mortality rate. Their main advantage is detection of breast cancer before it can be detected as a palpable lesion (7). Mammography was used for the first time in 1913 in order to show the spread of the tumor to the axilla, the importance of accurate positioning and compression could only be understood in the 1950s (8). The use of mammography as a screening method reduced breast cancer mortality rate by at least 25% (9). The American Cancer Society recommends a baseline mammography between ages 35-39, followed by annual repetitions after 40-years (10). Detection of microcalcifications in 20-25% of all cancer cases emphasizes the importance of mammography for early diagnosis. Microcalcifications are the major finding in mammography (11,12). In our study, 59.2% of patients suspected for malignancy were diagnosed with mammography, and the incidence of pathological microcalcifications was found as 25.9%. In addition, the radiation dose was 0.1 -0.2 rad, which is within safety limits (13). There are no studies showing the contribution of screening with USG on breast cancer mortality. However, various studies focused on the affect of USG on breast cancer diagnosis, especially in women with mammographic dense breast tissue. These studies reported that USG can detect lesions undetectable by MMG in women with dense breast tissue, and the sensitivity of mammography was found as 78%, while this rate was 91% when MG and USG were used in combination (14). However, the specificity of ultrasonography is reported to be low with high false positivity rates, leading to unnecessary biopsies (14).

Screening methods are useful only when applied regularly. Cancers occurring in-between two scans are called interval cancers. It is more commonly seen in young women, and the prognosis of interval cancers is worse. Therefore, application of screening methods at appropriate intervals and frequency is important for early diagnosis (15).

The lifelong of breast cancer incidence of a 50-year-old woman during her remaining life is approximately 10% (16). In our study, the median age of women diagnosed with breast cancer was 56 years (SD = 22.6). It is stated that breast cancer is nowadays being detected at an earlier age. Breast cancer is rare under the age of twenty years. The incidence steadily increases after 20 years of age, and reaches a plateau between 45-55 years. A rapid rise in incidence is observed after 55 years (17). It is most common in developed countries, and least common in underdeveloped countries in Asia and Africa. When standardized by age, the rate in North America is 99 / 100,000, while this rate in Central Africa is 17 / 100,000. Breast cancer incidence in the world shows a 0.5% increase annually since 1990. The annual increase rate in China is about 3-4%. 15 years ago, cervical cancer was the most common cancer in India, whereas currently breast cancer has become the most common female cancer (18). In the current study, breast cancer rate diagnosed with screening was found to be 0.98% only in a certain area of Cyprus.

Breast cancer is the most common malignancy in the female population in Europe and North America, an estimated 1 out of 9 women are at risk of developing the disease (19). More than 10% of breast cancer in Western countries indicate genetic predisposition. Although there are no regular studies on breast cancer incidence in Northern Cyprus, according to data from a Southern Cyprus (Republic of Cyprus) study on the etiology of 1109 histopathologically diagnosed breast cancer, nulliparity, lack of breast-feeding, and family history of breast cancer were shown to be main disease-related risk factors in Cyprus population (19). In our study, the presence of family history of malignancy other than the breast in 32%, and family history of breast cancer in 16% in our patients with breast cancer was found to be interesting.

Early diagnosis is important in the treatment of breast cancer, and the positive contribution of breast cancer screening programs in morbidity and mortality has been shown in many studies. Although it has some disadvantages and therefore, some opposing views, MG is a screening method with proven efficacy. However, 5-10% of breast cancers are detected by physical examination without mammographic findings. Therefore, clinical breast examination should be performed in conjunction with screening mammography. The development of screening and recording programs for early diagnosis of breast cancer, which is a very important issue throughout the world as well as Northern Cyprus, and the development of recording programs, and implementation of standardized, modern treatment and follow-up programs with quality control not only in certain institutions but nationwide is extremely important.

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