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SHIRAZ BREAST CANCER STUDY PART II: SCREENING MAMMOGRAPHY IN A POPULATION-BASED BREAST CANCER SURVEY

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ABSTRACT

The purpose of this study was to assess the detection rate of mammography in breast cancer and the attendance rate in response to the call for screening mammography in females before the development of symptoms. One-thousand four-hundred and thirty-eight women over 35 years of age who had no complaint and had normal breast examinations were called for mammography. Out of the 10,000 women under study for breast cancer, 1,438 women were randomly called for mammography and actually 985 subjects turned up for mammography. All the mammograms were reported by the same radiologist, and physical examination of the breast was carefully performed by both radiologist and surgeon on any patient suspected of having a lesion in mammography. A total of 4 malignant non-palpable lesions were detected in 985 screening mammograms. The prevalence of breast malignancy is lower in our female population compared with the west and our detection rate in subjects with no physical findings comprises 0.4%. Since only 985 women turned up for screening mammography, the attendance rate is calculated as 68.5%. Mammographic findings consisted of 96 cases of benign-appearing breast nodules, 194 cases of calcification, 25 intra-mammary lymph nodes, 189 enlarged axillary nodes and 83 dense breasts. In conclusion, although mammography is a very helpful procedure in screening for breast cancer, the response can be low for a call for mammography and the prevalence of malignancy of the breast has been underestimated in the past.

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INTRODUCTION

Mammography screening for the detection of non-palpable breast lesions has not been performed in Iran until the present study. The prevalence of breast cancer in our population is not known but from other studies made without the help of mammography, it seems that breast cancer is not as common in our population as it is in the west and also it seems that a relatively higher number of young patients are operated for breast carcinoma in our population.

It is well known that screening mammography reduces the mortality of breast cancer in women aged 50-64 years,[1] but some controversy still remains concerning the value of screening mammography in women aged 40-49 years.[2-8] If screening mammography is to be performed in this region, it is well justified before the age of 50 years. Familiarity with different patterns of the breast parenchyma and its abnormalities in screening mammograms can help reduce the mortality of breast cancer. Sickles, at the University of

California during the 1970s, found that fewer than 10% of breast cancers detected were less than 1 cm, but since 1985 the median size of the screening - detected malignancies has decreased to 1.2 cm, and only 20% are 2 cm or larger.[9] The purpose of this study, in addition to the evaluation of the efficacy of mammography in the detection of breast lesions, is to open the way for more research in the field to enable us to find guidelines to reduce the mortality of breast cancer in our population.

SUBJECTS AND METHODS

This study was a part of the Shiraz Breast Cancer Study, in which 10 districts of the city of Shiraz were chosen, each one under the auspices of a local health center. Districts were chosen in a manner to include all the different socioeconomic groups, according to the part of the city in which they live, so it can be claimed that the total population is represented remarkably well.

In each center, experienced physicians trained a number of female personnel in physical examination of the breast. Then, each group was asked to refer to homes in their own district, asking each woman over 35 years of age to come to the health center for breast examination. Ten thousand women were called for this purpose. All the women with palpable breast lesions were sent to the surgeon and re-examined, and if the abnormality was confirmed by the surgeon, the patients were sent for mammography, at which time they were also examined by the radiologist. Each patient was then treated accordingly. All services offered to these patients, including mammography, were provided free-of-charge. There were 7 cases of malignancy in this group of 10,000 studied women, all of whom became the subject of another study. Then the trained personnel in each center randomly asked those women in whom physical examination had failed to show any abnormality to refer for screening mammography. To perform 1000 screening mammographies, 1438 women, who had no symptoms and showed no abnormality on physical examination, were randomly chosen and requested to refer for mammography free-of-charge but, until the final day set as the closing date for the project, 985 women referred to the mammography center. The aim was to perform 100 mammograms from each center. Any woman with an abnormal mammogram was examined by the radiologist and managed accordingly. Wire localization of the non-palpable breast lesion suspicious for malignancy was performed under mammography. The equipment used for mammography was the dedicated mammography unit model Mammo Diagnosts, by Philips. All mammograms were interpreted by the same radiologist and all mammographic abnormalities were subsequently recorded and classified.

RESULTS

Since out of 1438 women who were called for mammography only 985 turned up, this makes the attendance rate 68.5%. Amongst these mammograms, a total of 4 malignancies was found, making the detection rate of breast malignancy in the present study 0.4% of those with no clinical breast findings.

There were 11 patients with stellate non-palpable lesions but only 4 of these were malignant (all malignant cases had the stellate type of breast lesion) and one of the malignant lesions showed deep parenchymal retraction. There were 194 cases with some form of calcification. Two malignant cases were found with micro-calcifications in mammography. We found 77 single benign nodules in mammography (5 women with a single nodule in each breast) and 19 cases of multiple benign nodules.

Enlarged axillary lymph nodes were detected in 189 mammograms (26 of these bilateral) and internal mammary nodes were seen in 25. Amongst our mammograms we encountered 83 cases of dense breast tissue, 8 of which were bilateral; most of these women were asked to refer for follow-up mammography after one year.

DISCUSSION

Samples were chosen randomly from 10 different districts in the city of Shiraz, with a population of about 1,200,000. All women who were invited for screening mammography were aware that the service was free-of-charge, but women of higher socioeconomic class showed far better attendance. The health center covering the area of the higher socioeconomic class made 110 invitations to perform 100 mammographies (an attendance rate of 90.9%), whereas one of the centers with the lowest socioeconomic population had to make 162 invitations for an attendance of only 88 (an attendance rate of 54.3%). Far lower attendance is to be expected when mammography is not free-of-charge in the lower socioeconomic group. This may represent one of the difficulties to be faced in a screening program as such in our population. To solve this problem, a tremendous amount of publicizing is needed to educate women on the importance of this matter.

The attendance rates in studies performed in the west range between 60.5% to 87%.[10-15] Our overall attendance rate was 68.5%. There were 4 cases of malignancy in this study comprising a detection rate of 0.4%. This figure does not represent the true prevalence, since our study excluded the malignant cases found on physical examination by trained health personnel. In fact, from among the total number of subjects ranomly selected for physical examination (10,000 women), 7 malignant cases were found by physical examination alone, and mammography in this

group was only performed after the lesion was discovered in physical examination. Also, there were 20 known cases of breast cancer in the study population which had already been diagnosed and treated. Therefore, the corrected prevalence is 0.47%. Although this figure is lower than the corresponding values obtained in the west,[11,13,15,16] it is higher than previously expected. Curpen et al.[17] found the prevalence of breast cancer to be 0.3% in the 40-45 year age group and 0.55% in the 50-64 year age group. Faulk et al.[18] found 0.57% cancer in the 50-60 year age group and 0.92% in elderly women. It is essential to elaborate on the most subtle changes on the screening mammogram if we expect to reduce the mortality rate of breast malignancy by such a program. Stellate lesions are to be considered very important; 4 out of 11 such lesions in this study proved to be malignant. Reiff et al. found that among 86 cases with ductal carcinoma *in situ*, 7 cases (8%) showed stellate-appearing lesions in mammography.[19]

Calcification in the breast is a very common phenomenon but clusters of microcalcification and to some extent scattered microcalcifications are the important mammographic findings. In this study, out of 194 mammograms showing some form of calcification, only 2 proved to be malignant. It must be remembered that only some cases of clustered calcifications are due to malignancy. Egan et al., in 468 biopsies of lesions with clustered calcifications, found 353 benign and 115 malignant lesions.[20]

Sickles, in 300 mammographies of non - palpable breast malignancies, found clustered calcification in 42% of cases, but only 23% showed the rod, curvilinear and branching shape typical of malignancy.[21]

In conclusion, we found that although screening mammography does not replace physical examination in the detection of breast lesions, it is nonetheless very useful in the early detection of non-palpable lesions, especially those of a malignant nature. However, the problem of lack of response to a call for screening mammography still exists in our population. In order to achieve the successful screening system necessary to reduce the mortality of breast malignancy, the introduction of a well-planned program financed by the government is imperative.

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Editorial comment

Screening mammography for women in their 40s continues to be a hotbed of controversy. More is being learned about the accuracy of mammography under different circumstances.

The sensitivity of mammography increases with age.[1] Among postmenopausal women, the sensitivity is higher in fatty breasts than in dense breasts.[2] Mammography may be less accurate among women receiving hormone replacement therapy, possibly due to the increased breast density brought about by hormone use.[3] If this finding is replicated, information will be needed concerning whether short - term withdrawal from hormone replacement therapy before mammography will enhance the accuracy of mammography.

The cumulative risk of a false positive result from a breast-cancer screening test is unknown. A 10-year retrospective cohort study of breast cancer screening and diagnostic evaluations among 2400 women who were 40 to 69 years old has been performed in ICBC (Iranian Center for Breast Cancer). A total of 9, 762 screening mammograms and 10, 905 screening clinical breast examinations were performed, for a median of 4 mammogras and 5 clinical breast examinations per woman over the 10 - year period. Of the women who were screened, 23.8 percent had at least one false positive mammogram, 13.4 percent had at least one false positive breast examination, and 31.7 percent had at least one false positive result for either test. The false positive tests led to 870 out-patient appointments, 539 diagnostic mammograms, 186 ultrasound examinations, 188 biopsies, and 1 hospitalization. They estimate that among women who do not have breast cancer, 18.6 percent will undergo a biopsy after 10 mammograms, and 6.2 percent after 10 clinical breast examinations. For every 100 dollars spent for screening, an additional 33 dollars was spent to evaluate the false positive results. Therefore, over a 10 year period, one - third of women screened had an abnormal test result that required additional evaluation, even though no breast cancer was present. Techniques are needed to decrease false positive results while maintaining high sensitivity. Physicians should educate women about the risk of a false positive result from a screening test for breast cancer.

I do not recommend mammography for all women in their forties. Each woman should decide for herself whether to undergo mammography. Despite the proven capacity of mammography to save lives among women 50 years of age or older, it continues to be underused, especially among poorer women. Low socioeconomic status is also associated with delays in follow-up of abnormal results.

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