Ten year breast cancer screening and follow up in 52200 women in Shahre-Kord, Iran (1997-2006)

Khadivi R[1], Harrirchi I[2], Khosravi Z[3], Akbari ME[4]

Abstract

Introduction: This study was conducted to determine the outcomes of the project of 'Integration of Breast Cancer Screening and Early Detection' into Primary Health Care (PHC) System and to detect the incidence rate, mortality rate and the stage of reported breast cancers, during the timeframe of the project in Shahre-Kord.

Methods: A prospective cohort study was conducted, reviewing medical records of all women aged over 30 in Shahre-Kord district who participated in the screening project between 1997 and 2006. Patients' demographic data, risk factors, diagnostic approach, treatments after definite diagnosis, and time of death of the deceased patients due to breast cancer were investigated from four sources: Provincial Health Centre, direct conversation via telephoning and interview, medical records of patients admitted to Seyed-Al Shohada Hospital, Isfahan (as the only referral oncology hospital in the region), and the provincial vital registry system as a part of national cancer registry.

Results: Overall 52200 women were eligible to enter the study and in this population, 40 breast cancer cases were detected. Incidence rate of breast cancer in women older than 30 years, during the timeframe of study, is estimated as 77.6 per 100000. Clinical features of the patients were as follow: stage-IIA (20%), stage-IIB (40%), stage-IIIA (30%) and stage-IIIB (10%). All 40 cases of cancer underwent pathology diagnosis, which showed infiltrative ductal carcinoma in 38%, invasive ductal carcinoma in 33%, ductal carcinoma in 25%, and infiltrative coloidal carcinoma in 4% of them. During the study, 31 cases (77.5%) survived and 9 cases (22.5%) died, all due to breast cancer.

conclusion: The mean age of breast cancer in this study was significantly lower than Western countries. Mortality rate due to breast cancer in this study during ten year follow up was 1.73 in 100000 women population, which is less than the national figure of 3.16 in 100000.

Keywords: breast cancer, screening, mortality rate

1- Associated professor, Department of Community Medicine, Shahrekord University of Medical Sciences
2- Associate Professor, Cancer Institue, Tehran University of Medical Sciences
3- Health Center of Shahrekord District, Shahrekord University of Medical Sciences
4- Professor of surgical Oncology, Cancer Research Center, Shahid Beheshti Medical University (MC)

Corresponding Author:
Mohammad E Akbari MD
Email: info@crc.ir

Introduction

Breast cancer is one the most common cancers in women throughout the world and the first in Iranian females. Prevalence rate of this cancer is continuously and constantly increasing[1]. Breast cancer in American women is almost the most frequent diagnosed cancer and the second cause of death due to cancer[1]. One ninth of American women become affected with a type of breast cancer in their life.[2] Although in 1985 the highest incidence rate of breast cancer was in the USA and UK, a remarkable reduction in mortality rate was seen in both countries, since breast cancer is detectable in very early stages by education and proper interventions and usually treatment is more effective in early stages[3]. In I.R.Iran there are 7000 new cases annually with an incidence rate of 1/10000.

Breast carcinoma is the second cause of death related to cancer in Iranian women after stomach cancer.

The highest mortality rate due to breast cancer is seen in low income countries. Despite the effectiveness of evidence based management of breast cancer, limitations in resources have led to reduced capacity of early detection and proper and timely treatment of the disease. Early screening of breast cancer in a cost-effective manner improves longevity[4]. Early detection includes both symptomatic and screening of asymptomatic women. The main prerequisite for early detection is reassurance, in which demanding women are supported efficiently to access medical services[5].

Implementation of screening programmes in various studies has caused a reduction in mortality rate[6;7]. Screening breast cancer with mammography can significantly reduce the mortality rate [8-11] but it is strongly related to the existing resources in each country.

This study was designed to verify the project outcomes of 'Integration of Breast Cancer Screening and Early Detection' into Primary Health Care (PHC) System and to detect the incidence rate, mortality rate and the stage of the reported breast cancers, during the timeframe of the project in Shahre-Kord, the capital city of Chaharmahal and Bakhtyari province in the centre of I.R.of Iran.

Method

In a prospective cohort study, investigating clinical course of the condition, all women from Shahre-Kord who aged over 30 and participated in the screening project between 1997 and 2006 were studied. All the cases were examined by health personnel in primary health care system and were referred to family physicians and then to a surgeon if indicated. Clinical and Para clinical investigations such as Fine Needle Aspiration Cytology (FNAC) were conducted and based on the diagnosis, treatment commenced. Because of the limitations in resources, imaging was not included in our diagnostic approaches during the project.

Data collection

Essential information was collected by a general practitioner in four stages. In the first stage, according to the consent issued by the Provincial Health Centre, patients' names and addresses were defined and then a questionnaire survey comprising of patients' demographic data, risk factors such as age at the time of diagnosis, marriage age, menarche age, menopause age, family history of breast cancer and also the reason for admission and referral process, was filled out through direct contact with their residence and interview.

Data of biopsy, tumour type, and treatment plans such as mastectomy, chemotherapy, radiotherapy or Tamoxifen administration was extracted from patients' medical records admitted to Seyed-Al Shohada Hospital, Isfahan. This medical centre is the only referral site in the region for cancer patients specially when chemo-radiotherapy is decided, and all patients, therefore, have medical records there. To complete the other parts of the questionnaire, time of death of the deceased patients due to breast cancer, age at the time of death and cause of death were investigated from Provincial Health Centre and the provincial vital registry system.

By completion and collation of the questionnaires, data was processed with SPSS and descriptive (mean and SD) and chi square analysis were calculated.

Results

Breast Cancer Screening Project was actively done between 1997 and 2000. 52200 women were eligible out of whom 60% were urban and 40% were rural inhabitants. In the first year, a total number of 38098 (74.4%) and in the second year, 41983 women (78.94%) underwent clinical exams of whom 55% and 45% were inhabitants in urban and rural areas, respectively. Urban coverage in the first year was nearly 63% and reached more than 72% in the second year while in rural areas the coverage was 92% and 89% in the first and second year, respectively.

In this project, the first step after detection of a mass was Fine Needle Aspiration (FNA). Overall, 403 FNAs were done that resulted in the detection of 28 malignant, 213 benign and 162 indefinable cases. Twelve cases were detected accidentally during the project when referred to a specialist or hospital, which made the overall sum of 40 malignant cases (70% in screening and 30% accidental). The incidence rate of breast cancer in the women over 30 years of age in the two years of project was estimated to be 78 in 100000 annually.

The youngest breast cancer patient was 29 years old and the eldest was 72 and the mean age was 45 (SD:11.5). The minimum and maximum age of menopause was 34 and 50, respectively (mean: 42, SD: 2.1). Ten percent were single and just one case (2.5%) was infertile. Minimum age for the first delivery was 15 and the highest age was 33 while 15% had no children. A positive family history was found in 3 cases (7.5%) and the remainder had no breast cancer in their close family members (92.5%). About 95% (38 cases) were admitted with a breast mass and 5% with an auxiliary lump or breast pain. Clinical stages were as follows: 20% in stage-IIA, 40% in stage-IIB, 30% in stage-IIIA and 10% in stage-IIIB.

All 40 cases of breast cancer underwent biopsy which showed infiltrative ductal carcinoma in 38%, invasive ductal carcinoma in 33%, ductal carcinoma in 25% and infiltrative coloidal carcinoma in 4% of them. About 90% underwent mastectomy while breast conserving surgery was done in the remainder (10%) who were all single. All cases were under treatment with chemotherapy, radiotherapy and

Tamoxifen. During the follow up, 31 cases (77.5%) survived and 9 cases (22.5%) died, all due to breast cancer. There was no statistically significant difference in patients' survival between the two methods of cancer detection (screening v accidental).

In the screening project, after clinical examination by a surgeon, the first step was an FNA, which revealed benign features in the majority of cases; 90.07% was benign and only 9.93% was malignant (one in every 13 case of biopsy). Table-1 demonstrates the proportional frequency of breast cancer according to the referral pattern.

Table 1: Frequency of breast cancer according to the referral pattern

	Deceased	Survived	Total
Screened patients	6 (21%)	22 (79%)	28
Discovered accidentally	3 (25%)	9 (75%)	12
Total	9 (22.5%)	31(77.5%)	40

Discussion

In Charmahal Bakhtiari Province, breast cancer is the most common form of cancer in women, as it is in the rest of the country (12.86% and 23.16% of all cancers, respectively). The incidence rate of breast cancer in this province is around 0.02% in women aged 30 or over[12]. This study revealed that the incidence rate of breast cancer in this two year project was 77.6 per 100000 in women aged 30 or higher, which could be interpreted as 39 new cases per 100000 per year in average. The higher incidence rate in the short timeframe of this study (39 vs. 20) could be the result of active screening of patients within a limited time which led to finding cancer patients in earlier stages even without using mammography. Nevertheless, if the screening project continued for a while, it was very probable to see a lower incidence rate. Finding so many cases in earlier stages undermines the necessity of screening for this common cancer in the community relative to their resources.

Breast cancer is the second common cancer in women from Tehran with a mean age of 51.3 ± 12.5 at the time of diagnosis and an incidence rate of 17.9 in 100000 women. About 31.4% are younger than 20 years old[13]. In another study in Isfahan between 1990 and 1995, breast cancer was also the second most common cancer in that province [14]. The incidence of breast cancer in Fars province has been reported as 6.6 (2.5-10.7) per 1000 with 55% of these cancers in patients younger than 50

years[15]. Incidence rate of breast cancer in Bushehr is 7.97 per 1000[16] and based on the national cancer registry, the incidence rate is 1 per 10000 in the whole population.

The prevalence rate of breast cancer in Egyptian women in the first stage of screening was 8 per 1000 and in the second round was 2 per 1000. In average, the prevalence rate was 3 per 1000 after the second round of screening and follow-up[17], which is higher than what we found in this study. In the USA, 75-80% of breast cancers are found in women over the age of 50[2]. In our study, however, the most affected age group was 35-45 years. The most common age group for breast cancer in Isfahan was 36-45 while it was 39-49 in Tehran.

In a large study conducted in 18 surgical wards in Tehran, the mean age of patients with breast cancer was 47.1 (SD: 12.3). The number of cases in the age group of 40-49 years was more than expected[18]. In another study in Tehran, mean age of breast cancer was 48.8 years and similarly the age group of 40-49 years had the most cases; 23% of breast cancers happened in women younger than 40[19]. In a study by Jihad Daneshgahi on 3085 pathological reports of breast in five large hospitals in Tehran between 1985 and 1995, a total of 903 breast cancer cases were found. The most frequent age group was 39-49 and 70% were in the advanced stage (stage-III), in which the survival rate is quite low. [20]Therefore the prevalent age of breast cancer in Iranian women is less than Western counterparts and it affects women almost one decade sooner.

The majority of breast cancer patients in Tehran (71%) have infiltrative ductal carcinoma and 70% are in stage-III at the time of diagnosis[21]. In another study in Tehran, around 83% were in stage-II or higher[22]. In our study clinical staging was as follows: 20% in stage-IIA, 40% in stage-IIB, 30% in stage-IIIA and 10% in stage-IIIB. Moreover, the most common type of breast cancer (83%) in Iran is infiltrative ductal carcinoma[23;24].

In another study in Singapore on breast cancer survival, the survival rates of 2, 5 and 10 years in women aged 40-49 years are reported in 84%, 67%, and 56% of the patients, respectively[25]. Five and 10-year life expectancy of Scottish women with breast cancer is 76% and 65%, respectively and the highest chance of survival was for 40-49 years age group[26]. In a prospective cohort study in Tehran on 167 patients with breast cancer, 5-year life expectancy was 62%. This is between Western and Eastern world rates[27]. In another study based on personal experience by Akbari,et al, 5 and 10 year

survival for breast cancer patients was 82 and 77 percent, respectively. Although due to limited resources mammography was not included in our study, 7-year life expectancy was 77.5%, which was higher than the Scottish rate. In this study, nine cases (22.5%) died due to breast cancer. Mortality rate due to breast cancer in our study was 1.73 in 100000, which is less than the national figure of 3.16 in 100000[28] which may be the most appropriate translation of screening based on available resources.

In a number of studies, up to 40% of breast malignancies are diagnosed by patients through Breast Self Examination (BSE); therefore, BSE is a main part of screening[29]. Nonetheless, studies in England, Leningrad and Shanghai showed no significant difference in mortality rates in BSE and non-BSE groups. In addition, biopsy rate was higher in BSE group[3]. Providing BSE education to women who are at risk has resulted in more referrals to physicians by women who detect a mass in self examination. In our study, 38 patients (95%) referred to their physicians with a breast mass in whom cancer was diagnosed.

In this study, all patients with a normal Breast Self Examination (BSE) and Clinical Breast Examination (CBE) were omitted. Studies indicate that masses smaller than 1 cm are not properly touchable and detection of such small lumps is possible through using other diagnostic approaches like mammography, regardless of the result of BSE and CBE [3]. On the other hand, in this project, the first step after detection of a breast mass was Fine Needle Aspiration (FNA) without any radiological or ultrasound guide, while in screening programmes in developed countries, up to 70% of masses are diagnosed when untouchable [30]. There is a wide range of FNA specificity and sensitivity reported in the literature with false positives and negatives. In a review of 31340 published papers about FNA, sensitivity ranged from 60% to 98% and the range of specificity was between 34-100%, which was mostly related to the physician's skills[31]. In our study, however, there was no diagnostic test rather than FNA; therefore, specificity and sensitivity of the tests were not computable.

There was no statistically significant difference in patients' survival between the two methods of cancer detection (screening *vs.* accidental). This was perhaps due to the distribution of health promotion activities and also geographic limitations of the project. In a study in the USA between 1990 and 1996 on patients with breast cancer, the incidence rate was higher in urban areas, [2] which is comparable to our results. (62%)

In conclusion, screening of breast cancer in Iranian women using FNA test by skilled and experienced physicians is an appropriate method, since many patients can be diagnosed in earlier stages of the condition which results in an improved life expectancy.

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