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CLINICAL INVESTIGATIONS

Knowledge About Breast Cancer and Mammography in Breast Cancer Screening Among Women Awaiting Mammography*

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Abstract: The purpose of this study was to evaluate knowledge about breast cancer and mammography in breast cancer screening among women awaiting mammographic examination. A cross-sectional survey was carried out of 298 women with an age range of 29-79 years through interview before mammographic examination. The questionnaire was designed specifically for this study, and a total of 100 points was given for all correct answers. Women's perception of susceptibility to breast cancer, severity of the disease, barriers to breast cancer screening, and perceived benefits of mammography were determined. Their knowledge about the risk factors of breast cancer and self-examination were also assessed. The most striking points in this study were that 95.3% of respondents knew that women should have had periodic mammographic evaluations and 87.6% of them were aware of the fact that mammography could show early occult cancer. However, 47% had never had a mammography screening test. When scoring was done for each correct answer, the mean score was 62.39 ± 14.36 . The majority of respondents (71.1%) declared that they practiced breast self-examination and their scores were significantly higher ($P = 0.014$) than those who did not. Despite expectations, knowledge about breast cancer and mammography screening was not low in the study population, although participation in mammographic screening tests was less than optimal.

Key Words: Mammography, breast neoplasms, cancer screening, information management

Introduction

Breast cancer is the most common cancer and the second principal cause of cancer deaths in women (1-6). There is sufficient evidence that an annual mammography in women over 50 years of age is effective in reducing the mortality rate from breast cancer (2,4,6-10). It is essential to have a better understanding of the health status of the female population. Equally important is an understanding of these groups' acceptance of those behavioral recommendations (4).

Several studies have examined predictors of women's adherence to mammography screening guidelines, including women's knowledge, behavior, and beliefs about breast cancer, knowledge of risk factors, preventive attitudes and mammography (2-5,7,8,11,12).

It was obvious that there have been significant improvements in knowledge of and encouragement to have mammograms (11). Although routine screening can be effective in the early detection of breast cancer, mammography remains underused by some women (6).

The aim of this study was to evaluate behavior and knowledge about breast cancer, its risk factors and preventive measures, and mammography in breast cancer screening among women awaiting mammographic examination. As no actual program on screening procedures for breast cancer has currently been established in our small city, we plan to use the data and results obtained from this survey for motivating women to attend screening for breast cancer through an appropriate educational health program.

* This paper was presented at the 89th Scientific Assembly and Annual Meeting of the RSNA 2003 in Chicago, Illinois, USA.

Materials and Methods

A cross-sectional survey was carried out among women awaiting mammographic examination in the mammography unit of our radiology department from October, 2002, to April, 2003. Four hundred ninety-eight patients were examined in this period, but 200 of these who could not or did not want to answer the questions were excluded from the study. One hundred fifty patients were illiterate and they did not agree to participate in this study. Another 50 were older than 80 and were not suitable. A face-to-face interview before mammographic examination was performed with the remaining 298 women with a mean age of 48.1 ± 7.5 years (age range 29-79 years). When the patients arrived at the radiology department, our technicians asked them to read and sign the questionnaire. There were 21 questions plus 4 subquestions evaluating the following information: demographic data (age, education, employment), knowledge about incidence, mortality, screening tests (clinical breast examination (CBE), breast self-examination (BSE) and mammography) and risk factors (age, obesity, family history, bilateralism of breast cancer) of breast cancer, preventive attitudes or beliefs (awareness of benefits, barriers to diagnosis in younger women and knowledge about X-rays), and also breast

sonography. Participants were not allowed to use any materials or sources during the test. The questionnaire was a combination of true-false and multiple choice questions, and 16 of these questions were aimed at knowledge evaluation. They were given 6.25 points for each correct answer, and the score per participant was evaluated out of a total of 100 points. This study protocol was approved by our institutional Ethics Committee and informed consent was obtained from all participants.

Statistical analysis was done using the SPSS version 10.0 statistical program. The data were analyzed using the t-test. All results were expressed as means of ± SD. A P - value of <0.05 was considered significant.

Results

The departments concerned and the reasons for referring the patients for mammography are shown in Table 1. More than half of the patients (58%) were referred by the department of Obstetrics and Gynecology. The most common reason (27%) for mammography examination was noted as to evaluate breast parenchyma before hormone replacement therapy (HRT) for women in the perimenopausal period.

Table 1. Distribution of the patients in terms of referring departments and clinical statements.

Characteristics	No. of patients (n = 298)	%
Referring department		
Obstetrics and Gynecology	172	57.7
Surgery	69	23.1
Family Medicine	30	10.1
Internal Medicine	15	5.0
Pulmonary Medicine	6	2.0
Others	6	2.0
Clinical statement		
Perimenopausal	80	26.8
Check-up	77	25.8
Patients under HRT treatment	45	15.1
Breast mass	32	10.7
Breast pain	25	8.4
Breast discharge	19	6.4
Breast cancer	10	3.3
Unilateral mastectomy	7	2.3
Irregular menstrual bleeding	3	1.0

Table 2. Sociodemographic characteristics of participants.

Characteristics	No. of patients (n = 298)	%
Age group (mean \pm SD)		
29 (-)	1	0.3
31-39 (37.1 \pm 2.0)	25	8.4
40-49 (44.9 \pm 2.5)	165	55.4
50-59 (52.9 \pm 2.4)	82	27.5
60-69 (64.2 \pm 3.1)	21	7.0
70-79 (72.5 \pm 4.4)	4	1.3
Level of education		
Illiterate	25	8.4
Literate	5	1.7
Primary-school (0-5 years)	115	38.6
Secondary-school (6-8 years)	19	6.4
High-school (9-11 years)	74	24.8
University (12-17 years)	60	20.1
Employment		
Unemployed	188	110
Employed	110	36.9

Sociodemographic characteristics of the participants are summarized in Table 2. Most of the participants having mammographic examination belonged to the 4th decade age group, followed by the 5th, 3rd, 6th, 7th and 2nd decades, in that order. Of the study population, 63.1% were unemployed and 48.7% had completed primary school education or less.

Patients' knowledge about the incidence and risk factors of breast cancer is provided in Table 3. Of the patients, 49.3% were not aware of the high incidence of mortality from breast cancer. Risk factors of breast cancer were known by more than half of the participants.

Patients' knowledge about methods of diagnosis of breast cancer and its screening practices is shown in Table 4. Participants having no information about mammography constituted 38.3%, the largest group. The most striking points in this study were that 95.3% of respondents knew that women should have periodic mammographic evaluations and 87.6% of them were aware of the fact that mammography could show early occult cancer, which would be impossible to detect by routine breast examination. Most of them were aware of X-rays being used in mammography, but few knew that X-rays could be hazardous for the breast: 59.7% knew that there was an optimal age (35-45 years) to start mammography examination. We also wanted to

investigate participants' knowledge about ultrasonography (US) of breast cancer. Of the patients, 68.8% (205) had never had US examination and, therefore, their knowledge about US was poor.

Of the participants, 71.1% (212) had done BSE. However, 47% (140) had never had a mammography screening test. Surprisingly, during evaluation of previous mammography screening among women older than 50, who composed 35.9% (107) of the study population, we noted that 63.6% (68) of them had already had mammograms. Only 56.0% (167) of participants declared that they would have a mammogram without any complaints, if their doctors did not advise them to.

When scoring was done for each correct answer, the mean score was 62.39 ± 14.36 (ranging between 25 and 100). The participants who had practiced BSE had significantly higher scores ($P = 0.014$) than those who had not. Comparison of behavior of women toward self-assessment and methods of diagnosis of breast cancer, with scores, are evaluated in Table 5. Additionally, there was no significant difference in scores between unemployed (62.0 ± 14.5) and employed (63.1 ± 14.2) participants ($P = 0.503$), nor between lower educated participants (62.2 ± 14.7) and those educated beyond primary school (61.8 ± 14.3) ($P = 0.821$).

Table 3. Knowledge about incidence and risk factors of breast cancer.

Items	No. of patients responding correctly (n = 298)	%
Breast cancer is the most common cancer in women	234	78.5
Breast cancer is a disease having high a incidence of death	142	47.7
Risk factors		
Positive correlation with age	199	66.8
Positive correlation with obesity	148	49.7
Positive family history of breast cancer	242	81.2
Presence of a previous contralateral breast cancer	206	69.1

Table 4. Knowledge about methods of diagnosis of breast cancer and screening practices.

Items	No. of patients responding correctly (n = 298)	%
Knowledge about mammography (self-assessment)		
More than sufficient	7	2.3
Sufficient	64	21.5
Partially sufficient	67	22.5
Insufficient	44	14.8
No idea	114	38.3
What kind of energy is used in mammography examination?	227	76.2
Is there a potential risk of future breast cancer that can be caused by the energy type used in mammography?	111	37.2
There is no increase in incidence of breast cancer after mammography examination following the first 10 years.	181	60.7
Knowledge about ultrasonography		
Used for younger women and a help (complementary) to mammography	130	43.6
What kind of energy is used in US?	64	21.5
Is there a potential risk of future probable breast cancer that can be caused by the energy type used in US?	216	72.5
Mammography can show early occult (nonpalpable) breast cancer	261	87.6
Healthy women should have control mammograms at certain intervals	284	95.3
There should be an age limit for mammography.	137	46.0
Most appropriate age group (35-45) for first mammogram	178	59.7

Table 5. Comparison of women’s behavior toward breast self-examination and methods of diagnosis of breast cancer with scores.

Items	Yes (n) mean ± SD	No (n) mean ± SD	P Value*
Ever did breast self-examination	63.6 ± 13.8 (212)	59.1 ± 15.3 (85)	0.014
Ever had a mammogram	63.2 ± 12.9 (158)	61.5 ± 15.9 (140)	0.328
Without a doctor’s advice, would you have a mammogram without any complaint?	63.7 ± 13.5 (167)	60.8 ± 15.3 (131)	0.086
Ever had a sonogram	64.2 ± 13.1 (93)	61.6 ± 14.9 (205)	0.134

*Compared by using the t-test

Discussion

The 3 methods recommended for detection of breast cancer are BSE, CBE by a health care professional, and mammography, the third being the most effective (2-4,8).

A consortium of American medical organizations, including the American Cancer Society, has issued the following recommendation: between the ages of 40 and 49 years, women should undergo a CBE and mammography every year or 2. Women older than 50 years should have an annual CBE as well as a mammogram (1,4,8,13). Mammography and CBE facilitate the early detection and treatment of breast cancer, which is responsible for lower mortality rates (8,9). In a screening setting, about 10% of breast cancers will only be detected by CBE (13).

The value of BSE is less established. While the findings of a clinical trial suggested that BSE results in no difference in risk of mortality from breast cancer, a review of case-control studies found that BSE may reduce this risk. Despite the inconclusive evidence, it is thought that BSE makes women more "breast aware", which in turn may lead to an earlier diagnosis of breast cancer (9). The rationale behind extending BSE practice as a screening test is the fact that breast cancer is frequently detected by women themselves without any other symptoms. A meta-analysis of studies investigating the possible benefits of BSE has shown that regular practice increases the probability of detecting breast cancer at an early stage (2).

Our study revealed the surprising finding that many participants had practiced BSE. Supporting our study, which included participants living in a small city, it was found that BSE was more prevalent among nonmetropolitan women. This indicates that these women are sensitive to breast cancer issues but may not have ready access to mammography and CBE (9). Another interesting similarity was noted in that approximately half of our study population had never had a mammography screening test although the majority of them knew that women should have periodic mammographic evaluations and they were aware of the fact that mammography could reveal early occult cancer.

There may be several reasons for not undergoing mammography or CBE. The cost of mammography may be a problem, particularly for a woman who does not

have social security. Mammography-induced pain and discomfort, the effects of the radiation received during a mammogram, have been reported as a barrier (1). Most of our patient population knew that they would be subjected to radiation, but few of them were aware of its risk in the development of breast cancer. For women undergoing screening, the risk of dying from breast cancer induced by mammography is so slight that it is considered essentially too small to calculate. It is approximately equivalent to the risk of dying from lung cancer due to smoking 3 cigarettes. Possible fear of radiation exposure due to mammography should be addressed by putting the risk into proper perspective (13). Embarrassment during the mammography or CBE procedures has been reported as an issue for some women, particularly those having a mammogram for the first time and those having a male doctor (1,8). Participants in our study have a very closed culture and a traditional, conservative and men-dominated life style. The theory of reasoned action suggests that the intention to participate in screening for breast cancer is determined primarily by 2 factors: the woman's attitude toward breast cancer screening procedures and the social normative influence of the people who are important in her life (1). Educational programs can be accomplished in a culturally sensitive manner by considering these points. Husbands should be included in the cancer education programs and should also be informed. They cannot only support their wives and prevail on them to undergo screening, but can also reduce their own risk of cancer morbidity and mortality (5,12,14). It was reported that men were as conscious about breast cancer and mammography screening as women but had more favorable attitudes toward breast cancer screening than did women (12).

Unexpectedly, the mean score of correct answers to our questionnaire was better than 50%. It seemed that participants had been adequately informed on average. This may be explained by the media's role (TV, radio, newspapers) in educating the public about breast health and breast screening methods, and also participants' experiences of their relatives' or friends' suffering from breast cancer. On the other hand, most of the women who refused to participate in the study were illiterate; in contrast, those who agreed to participate mostly had higher education. This discrepancy may have affected the mean score that indicated a better than moderate level of

knowledge about breast cancer and mammography screening. However, scores from correct answers of participants having a high education level were similar to those of participants having a low education level.

It is not surprising that our patients who have practiced BSE answered more questions correctly than those who have not. Although the results of our survey were encouraging, the respondents were not representative of the whole female population. More than half of these women answered that their knowledge about mammography was insufficient. This paradox has resulted in a need to learn more about the sources that influence women to participate in breast screening (15).

The largest age group having had mammograms before was the 4th decade in our study. More than half of the patients were referred by the department of Obstetrics and Gynecology to evaluate breast parenchyma before HRT application for perimenopausal women. It can be proposed that for most women, the first consciousness of breast cancer and its screening guidelines appear in this period. Supporting this, a majority of women older than 50 years, who composed approximately 1/3 of the participants, had had previous mammography screening. In populations like ours, without an organized screening program, mammography use depends on referral by a general practitioner or specialist (2). It is clear that having a regular physician increases the likelihood of having a nonrecommended mammography (16).

In the literature many factors have been determined regarding adherence to breast cancer screening: demographic characteristics such as higher levels of education and income, marital status, younger age, social support, knowledge and preventive attitudes, a history of breast diseases, a family history of breast cancer, having a regular physician, ethnic background and residence area (2,6,17). Not surprisingly, we also found that BSE was significantly associated with a high education level. It was reported that BSE was strongly related to a positive history of breast disease, and this could reflect the lack of health education programs aimed at the general population. Knowledge of risk, such as a personal history of breast disease or a family history of breast cancer, increases the likelihood that a woman will practice BSE (2).

It is obvious that breast cancer is not well understood by women and there is a need for information and enlightenment if patients are to attend hospital early (3). If

health care professionals are going to increase women's participation in breast cancer screening activities, it is vital to learn more about women's attitudes toward these procedures (1,7). Earlier studies have suggested, however, that patient wishes are one of the most important predictors of physician behavior regarding screening. Patient wishes, therefore, probably play a substantial role in the use of nonrecommended screening (16). Women's willingness to learn, discuss, and share breast cancer information with their family and friends suggests that these low screening rates might be improved by focused educational intervention programs (4,5). In the scope of education programs, as well as holding educational panels aimed at the public, it is necessary to reach those women who cannot attend these meetings for various reasons. Programs for women, especially those who have low education levels, do not work and spend most of their time at home, should be encouraged. For this purpose, the media (local written and oral, radio, television, soapoperas, newspapers etc.) may be used. It was reported that through such programs, awareness of cancer, the importance of its early diagnosis, and prompt treatment have increased. These increased screening rates appear to be helping to increase the frequency with which early stage cancers are discovered (4).

In conclusion, despite expectations, knowledge about breast cancer and mammography screening was not low among women awaiting mammography. This may be explained by the media's role (TV, radio, newspapers) in educating the public about breast health and breast screening methods. However, their participation in mammographic screening tests was less than optimal. This may be due to traditional or closed cultural issues, especially in small cities.

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Mammography Survey Form

1. Age:
2. Employment:
 - 1) Unemployed
 - 2) Civil servant
 - 3) Worker
 - 4) Retired
 - 5) Self-employed
 - 6) Other.....
3. Level of education:
 - 1) Illiterate
 - 2) Literate
 - 3) Primary-school
 - 4) Secondary-school
 - 5) High-school
 - 6) University
4. One out of 10 women in the world develops breast cancer.
 - 1) True
 - 2) False
5. Breast cancer is a disease that has a high incidence of death.
 - 1) True
 - 2) False
6. Do you perform breast self examination considering possible breast cancer?
 - 1) Yes
 - 2) No
7. Please choose the most appropriate answer for you about breast cancer:
 - The risk of breast cancer increases with age 1) True 2) False
 - Obesity increases the risk of breast cancer 1) True 2) False
 - A positive family history increases the risk of breast cancer 1) True 2) False
 - There is an increase in risk of contralateral breast cancer when diagnosed in one side 1) True 2) False
8. Your knowledge about mammography:
 - 1) More than sufficient
 - 2) Sufficient
 - 3) Partially sufficient
 - 4) Insufficient
 - 5) I have no idea
9. Can mammography reveal early stage breast cancer that cannot be detected by palpation?
 - 1) Yes
 - 2) No
10. Have you ever had a mammogram?
 - 1) Yes
 - 2) No
11. Without a doctor's advice, would you have a mammogram without any complaint?
 - 1) Yes
 - 2) No
12. Should a healthy woman have a control mammography examination at certain intervals?
 - 1) Yes
 - 2) No
13. Is there an age limit for mammography examination?
 - 1) Yes
 - 2) No
14. Which age group is most appropriate for a first mammography examination?
 - 1) 15-20
 - 2) 25-30
 - 3) 35-40
 - 4) 45-50
15. What kind of energy is used in mammography examination?
 - 1) X-ray
 - 2) Ultrasound
 - 3) Radiofrequency

16. Is there a potential risk of future breast cancer that can be caused by the energy type used in mammography?
1) Yes 2) No
17. There is no increased incidence of breast cancer development after mammography examination in the following 10 years.
1) True 2) False
18. Which one of the following can be used for women who are too young for mammography examination or as a complementary modality to mammography?
1) X-Ray 2) Ultrasound 3) Computed tomography 4) Magnetic resonance imaging
19. Have you ever had ultrasound examination of the breast?
1) Yes 2) No
20. What kind of energy is used in ultrasound examination?
1) X-ray 2) Ultrasound 3) Radiofrequency
21. Is there a potential risk of future breast cancer that can be caused by the energy type used in US?
1) Yes 2) No

Thank you...

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