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Research article

Delayed presentation in breast cancer: a study in Iranian women

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Abstract

Background: A cross sectional study was conducted in Tehran Iran to examine the extent of patient delay and associated factors in the presentation of breast cancer.

Methods: A group of newly diagnosed breast cancer patients were interviewed and were asked about the period from first onset of symptoms to first medical consultation to indicate patient delay. This was studied in relation to patients' age, educational level, marital status, family history of breast cancer, history of benign breast disease, number of children and the nature of the first symptom seen.

Results: In all, 190 breast cancer patients were interviewed. Of these, 75% presented to physician within 3 months. Forty-two patients (25%) delayed more than 3 months. In multivariate regression analysis it was found that there was a risk for longer delay in widowed or divorced women (OR 3.7, 95% CI 1.5–9.7), women with a positive family history of breast cancer (OR 2.8, 95% CI 1.1–7.7), and less educated patients (illiterate: OR 5.2, 95% CI 1.5–17.7; primary schooling: OR 4.6, 95% CI 1.4–14.7). Significant associations also were found between delay presentation and the late stage disease (P = 0.01) and bigger tumor size (P = 0.004).

Conclusion: The findings suggest that one in four women with breast cancer present late and this has significant effect on their disease prognosis. To reduce patient delay health education programs regarding breast cancer should be implemented and target women who are at higher risk of delay.

Background

Delayed presentation of breast cancer is associated with lower survival [1,2]. Moreover the late stage of disease and high mortality are seen with delay in diagnosis and treatment of breast cancer [3,4]. There is evidence that smaller tumors are more likely to be treated successfully with limited breast surgery, and perhaps a better quality of life.

Delay in breast cancer is defined as patient delay (the interval between first detection of symptom and first med-

ical consultation) and system delay (the interval between first presentation to a medical professional and initial treatment). Prolonged delays usually defined as intervals greater than 12 weeks [3]. Delay and late stage at diagnosis of breast cancer are related to socio-demographic factors such as age, education, marital status, economic status, history of breast disease, family history of breast cancer, the nature of the first symptom and many other factors [1,3,5–7].

In Iran, breast cancer is one of the most growing and important women's health problems, although its statistics is very similar to that of the regional countries [8]. It is estimated that the crude incidence rate of the disease is about 20 new cases per 100,000 women per year. Given that Iran has about 30 million female population, this corresponds to a total number of 6000 new cases of breast cancer annually [9]; many of whom because of advanced disease at presentation (70%) die within a short period of time [10]. Therefore to improve breast cancer care understanding the magnitude of delay in breast cancer diagnosis is an important issue.

The aim of this study was to examine the extent of patient delay in Iranian breast cancer patients. Since most literature on delayed presentation of breast cancer is from developed countries it was thought that a study from a developing country with a different culture might contribute to existing knowledge on the topic.

Methods

A group of newly diagnosed breast cancer patients who were admitted to a university hospital or attending a breast clinic in Tehran, Iran were interviewed following their surgery or first course of chemotherapy between September 2001 and March 2002. After obtaining oral consent from each patient, data were collected using a structured questionnaire including socio-demographic factors, date of first symptom recognition and first medical consultation. Delay was defined as time intervals of more than 12 weeks from first symptom recognition to first medical consultation and thus patients were divided into two groups: those who presented at three months or less and those who delayed more than three months. Patients were excluded if their data concerning delay were unreliable. If patients were not sure of the date of first symptom recognition or could not recall the date, data considered unreliable. Clinical data including stage of disease, tumor size and lymph node status also were extracted from patients' medical records. Statistical analysis was performed using univariate and multivariate logistic regression models to calculate odds ratios (OR). Age, marital status, educational level, family history of breast cancer, history of benign breast disease, number of children and the nature of first symptom have been selected as potential explanatory factors. The Statistical Package for Social Sciences (SPSS) was used to analyze data [11].

Results

In all, there were 235 eligible patients. Of these, 203 patients (86%) were recruited into the study and the remaining 32 patients were missed or refused to be interviewed. Thirteen cases were excluded because of unreliable data, leading to a final study population of 190 breast cancer patients. The mean age of patients was 47.0 (SD

11.3) years, and most were married (80%). Patient delay ranged from less than one week to 60 months (Mean 3.8, SD 8.6 months). Delay of more than three months was reported by 25% of patients. The characteristics of study population and patient delay are shown in Table 1.

Table 2 shows the result of univariate logistic regression analysis. There was a significant risk for patient delay by marital status and educational level. Widowed and divorced women had a significant delay compared to married women (OR 3.4, 95% CI 1.5–7.7). Also a significantly higher risk of more than three months delay was found among illiterate (OR 5.7, 95% CI 1.9–16.5) and primary educated women (OR 4.2, 95% CI 1.5–12.1). No significant differences were found among the other variables studied.

Performing multivariate logistic regression analysis entering all variables studied, marital status, education levels and family history of breast cancer showed significant results (Table 2). There was a risk for longer delay in widowed or divorced women (OR 3.7, 95% CI 1.5–9.7), women with a positive family history of breast cancer (OR 2.8, 95% CI 1.1–7.7) and illiterate (OR 5.2, 95%CI 1.5–17.7) or primary educated women (OR 4.6, 95% CI 1.4–14.7).

Finally a cross tabulation analysis showed that delay of more than three months was significantly associated with advanced disease (P = 0.01), and bigger tumor size (P = 0.004). However, nodal status did not show significant results. The results are shown in Table 3.

Discussion

The study findings indicate that about 25% of patients with breast symptoms had a delay of more than three months before presenting to a health professional. This finding is comparable with other studies. Recent studies have shown a range of 19% to 32% for patient delay [1,3,4,12,13]. However the extent of patient delay can be different in different places. One explanation for such a difference might relate to the patients' health related behaviors and the social context they live in. It is argued that an intention to seek evaluation of breast symptoms is not merely a matter of education and economics but it is dependent on a complex picture of personal and social factors on the perceived amount of negative consequences of delaying diagnosis and on previous habit of health care utilization [5,14].

In this study, widowed and divorced women had a higher risk of delay. Perhaps one might argue that this could be explained by the fact that widowed and divorced women do not have enough motivation to seek help or care about themselves and lack support [15]. Socio-demographic fac-

Table 1: The characteristics of breast cancer patients (n = 190)

		No.	%
Age groups (years)			
	< 35	25	13
	35–44	54	28
	45–54	72	38
	≥ 55	39	21
	Mean (SD)	47.0 (11.3)	
	Range	24–82	
Marital status			
	Single	8	4
	Married	152	80
	Widowed/divorced	30	16
Education levels			
	Illiterate	56	30
	Primary	78	40
	Secondary/Higher education	56	30
Number of children			
	None	20	11
	1–3	88	46
	≥ 4	82	43
Family history of breast cancer			
	No	146	77
	Yes	44	23
History of benign breast disease			
	Yes	34	18
	No	156	82
First symptom seen			
	Lump	167	88
	Other*	23	12
Delay presentation (months)			
	≤ 3	142	75
	> 3	48	25
	Mean (SD)	3.8 (8.6)	
	Range	< 1–60	
Stage of disease (n = 165)			
	I	9	5
	II	94	57
	III	51	31
	IV	11	7
Tumor size (n = 170)			
	< 2 cm	21	12
	2–5 cm	93	55
	≥ 5 cm	56	33
Nodal involvement (n = 165)			
	No	46	28
	Yes	119	72

* including discharge, pain, and skin problems.

tors and delayed presentation of breast cancer have long been studied. Earlier studies on patient delay showed that marital status was significant predictor of delay [16], and this was confirmed in a few later publications [4,7]. However, the association between marital status and delay remains controversial [3,17] and at present strong evidence exist that marital status is unrelated to delay by patients [1]. It seems that the findings from this study and

other studies [18] clearly suggest that marital status and a positive family history of breast cancer are risk factors for both incidence of breast cancer and for delayed presentation in Iran.

Being less educated was a significant predictor of patient delay. The role of education and knowledge in decreasing delay has been confirmed in other studies [17,19–21].

Table 2: The result of univariate and multivariate logistic regression analysis on patient delay

	≤ 3 months (n = 142)	> 3 months (n = 48)	Univariate analysis		Multivariate analysis	
	No. (%)	No. (%)	OR (95% CI)	P	OR (95% CI)	P
Age groups (years)						
<35	20 (14.1)	5 (10.4)	1.0 (ref.)		1.0 (ref.)	
35–44	43 (30.3)	11 (22.9)	1.0 (0.31–3.3)	0.97	1.5 (0.40–5.8)	0.54
45–54	55 (38.7)	17 (35.4)	1.2 (0.40–3.8)	0.71	1.2 (0.33–4.1)	0.82
≥55	24 (16.9)	15 (31.3)	2.5 (0.77–8.1)	0.13	1.3 (0.34–5.4)	0.67
Marital status						
Married	121 (85.2)	31 (64.6)	1.0 (ref.)		1.0 (ref.)	
Single	5 (3.5)	3 (6.3)	2.3 (0.53–10.3)	0.26	1.2 (0.15–9.5)	0.86
Widowed/divorced	16 (11.3)	14 (29.2)	3.4 (1.5–7.7)	0.003	3.7 (1.5–9.7)	0.007
Education levels						
Secondary/Higher education	51 (35.9)	5 (10.4)	1.0 (ref.)		1.0 (ref.)	
Primary	55 (38.7)	23 (47.9)	4.2 (1.5–12.1)	0.006	4.6 (1.4–14.7)	0.01
Illiterate	36 (25.4)	20 (41.7)	5.7 (1.9–16.5)	0.001	5.2 (1.5–17.7)	0.009
Number of children						
None	12 (8.5)	8 (16.7)	1.0 (ref.)		1.0 (ref.)	
1–3	71 (50.0)	17 (35.4)	0.36 (0.13–1.0)	0.05	0.43 (0.10–1.9)	0.26
≥ 4	59 (41.5)	23 (47.9)	0.58 (0.21–1.6)	0.30	0.48 (0.13–2.0)	0.32
Family history of breast cancer						
No	105 (73.9)	41 (85.4)	1.0 (ref.)		1.0 (ref.)	
Yes	37 (26.1)	7 (14.6)	2.1 (0.85–5.0)	0.11	2.8 (1.1–7.7)	0.04
History of benign breast disease						
Yes	24 (16.9)	10 (20.8)	1.0 (ref.)		1.0 (ref.)	
No	118 (83.1)	38 (79.2)	0.77 (0.34–1.7)	0.54	0.66 (0.25–1.7)	0.39
First symptom seen						
Lump	122 (85.9)	45 (93.8)	1.0 (ref.)		1.0 (ref.)	
Other	20 (14.1)	3 (6.3)	0.41 (0.11–1.4)	0.16	0.51 (0.13–2.0)	0.34

The finding suggests that lack of knowledge about breast cancer is an important factor in Iran and there is a need for public educational programs especially for less educated women. However, in Iran social values and moral considerations limit the use of mass media for publicizing breast cancer awareness. Breast cancer is not taboo but because the breast is regarded as part of female sexual identity, people use the word chest instead. This is a cultural custom rather than a religious restriction. There is no evidence to suggest that religious beliefs interfere with early detection behaviors and contribute to subsequent delayed presentation of breast cancer in Iranian women [22].

The study did not demonstrate any association between age and patient delay, although the findings were in the expected direction. We suspect that the small number of cases in the reference category might attenuate a statistical significance. Studies have shown that older age is a predictor for patient delay [1,5,17]. A recent study on women's knowledge and beliefs regarding breast cancer concluded that since older age is a risk factor for both developing breast cancer and subsequent delayed presentation, any intervention program should target older women in par-

ticular [23]. In contrast it has been shown that women aged 50 years or younger had longer delays compared with older patients. The finding is explained by the fact that a higher index of suspicion of breast cancer exists for women older than 50 years than for younger women [24]. However, this could not be the case in the present study since the Iranian breast cancer patients are relatively ten years younger compared to their western counterparts [10].

In the present study the nature of the first symptom had no association with patient delay. It is argued that discovery of a breast lump reduces the patient delay and an association has been suggested in other studies [1,3,19]. Perhaps fear of cancer when a woman find a lump in her breasts, or lack of knowledge about common symptoms of breast cancer might explain why there was no association between the nature of the first symptom and delay in this study. However, the findings suggest that women need to be educated about the different types of breast cancer symptoms, especially the most frequent symptom, a non-tender breast mass. A qualitative study of delay among women reporting symptoms of breast cancer con-

Table 3: Association between delay presentation and clinical variables

	≤ 3 months	> 3 months	P
	No. (%)	No. (%)	
Stage of disease (n = 165)			
I and II	84 (67.8)	19 (46.3)	
III and IV	40 (32.2)	22 (53.7))	
	χ^2 = 6.02, df = 1		0.01
Tumor size (n = 170)			
< 2 cm	19 (15.1)	2 (4.5)	
2–5 cm	74 (58.7)	19 (43.2)	
≥ 5 cm	33 (26.2)	23 (52.3)	
	χ^2 = 11.1, df = 2		0.004
Nodal involvement (n = 165)			
No	36 (29.0)	10 (24.4)	
Yes	88 (71.0)	31 (75.6)	
	χ^2 = 0.33, df = 1		0.56

cluded that women need further information about the different types of breast cancer symptoms to assist symptom recognition as well as encouragement to seek medical advice if a symptom is ambiguous [12]. Similarly preliminary findings from the second phase of this study suggest that interventions to reduce delay behavior in help-seeking for breast symptoms should inform women of the diversity of breast cancer symptoms and do provide advice on how to obtain help for breast cancer symptoms [25]. As recommended health education programs should address both attention to cancer symptoms and appropriate help-seeking behavior otherwise if people do not intend to react when they detect such symptoms education becomes useless [26].

There were no associations between patient delay, history of benign breast disease and living in larger households. These factors may affect help-seeking behaviors in breast cancer patients. For example, it has been shown that women who live in larger households may have to care for children or other dependents and thus are at higher risk to present with late stage breast cancer [5,27]. Further studies are needed to investigate these associations, especially in Iran where strong family ties and cultural considerations exist.

Like other studies the findings indicated that those who presented late had significantly bigger tumor size and presented with an advanced stage of the disease. The influence of delay on tumor size and disease stage is well documented [1,2]. Although the present study do not provide information regarding the distribution of tumor differentiation, it is important to note that a substantial

proportion of late stage diagnoses of poorly differentiated breast cancer cases could be avoided if patients with breast cancer presented to a doctor earlier [28].

Finally, it is worth noting that there were several limitations inherent in this study and the findings cannot be generalized beyond the study sample. The sample size was small and thus the predictive power of the study was limited. Additionally, the questions used to recall dates and times such as first presentation of the disease and first medical consultation might be biased, especially in cases with longer delay. Another limitation was that there were no data for patients' knowledge and attitudes towards breast cancer. Health beliefs and knowledge of breast cancer are two important factors that influence help-seeking behavior and delay [29]. More recent studies indicated that the likelihood of patient delay is more related to behavioral and knowledge variables, which are in turn linked with advanced breast cancer at diagnosis [19]. Furthermore, it seems that in addition to patient delay, system or provider delay is also an important issue that merits further investigation. Unfortunately this was not investigated in this study and as indicated in a meta-analysis of the literature on delayed presentation of breast cancer, provider delay appears to be both under researched and underestimated [15]. However, the study results do provide some understanding on the topic and indicate that Iranian women need more education on breast cancer care. The study findings suggest that patient delay is an important health problem, and can be reduced by educating women who are at higher risk of delay. The next step is to implement interventions to reduce delays and improve outcomes in breast cancer patients.

Authors' contribution

NM, MA, and AS contributed to the process of data collection. ME contributed to the study design, the data analysis, and wrote the first draft of the paper. AM contributed to the design, the data analysis and wrote the final draft of the paper.

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