RESEARCH COMMUNICATION

Breast Cancer in Iran: a Survival Analysis

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Abstract

A prospective study was undertaken to examine survival in Iranian breast cancer patients. One hundred and sixty-seven breast cancer patients diagnosed in 1997 were entered into the study and followed up for five years. The mean age of thr patients at diagnosis was 47.2 (SD = 13.5), ranging from 24 to 81 years. A total of 39 patients were lost in the follow-up period, leaving 128 for analysis of data. Of these, 79 were alive and 49 were dead after five years. Most patients (61%) presented with advanced disease. Using life table analysis, the overall relative 5-year survival rate was found to be 62% (SE = 0.04). In addition, after adjustment for age at diagnosis, initial treatment (mastectomy, breast conserving surgery, and neo-adjuvant therapy), and disease stage, using Cox's regression model, it was found that receiving neo-adjuvant therapy as the initial treatment was an independent predictor of poorer survival (Hazard ratio = 4.56, 95% CI 2.20-9.44, P<0.0001). The other variables (older age and late stage disease), although associated with high hazards rates, were not significant. The study findings suggest that overall relative survival rate in Iranian breast cancer patients stands between western and eastern European countries and needs to be improved. It seems that early detection and better management using standard guidelines might contribute considerably to improvement of survival in women experiencing breast cancer.

Key Words: Breast cancer - Survival - Life table - Kaplan-Meier analysis - Cox Proportional Hazards Model - Iran

Introduction

Breast cancer remains the most common cancer among women. Compared with western countries the incidence of breast cancer in Iran is low but patients are relatively young and present with advanced disease (Harirchi et al., 2000; Harirchi et al., 2004). Furthermore despite improvements in survival for breast cancer patients in many countries (Taylor et al., 2003; Giordano et al., 2004; Thomson et al., 2004), it appears that the survival in Iranian breast cancer is poor. It has been suggested that both earlier diagnosis and changes in breast cancer treatment have contributed to improved breast cancer survival (Webb et al., 2004). However, studies have shown that variations in breast cancer survival partly depend on several etiological factors (Quinn et al., 1998; Thomson et al., 2001; Bradley et al., 2002; Shavers et al., 2003; Henson et al., 2003).

The objective of this study was to determine the 5-year survival in Iranian breast cancer patients who referred to the Cancer Institute in Tehran, Iran. It was thought a study on survival might help to find out factors that contribute to the present situation in Iran.

Materials and Methods

This was a prospective study to examine survival rate in Iranian breast cancer patients. One hundred and sixty-seven breast cancer patients with a confirmed pathological report diagnosed at 1997 were entered into the study and followed up for five years. Data were collected on demographic and available clinical characteristics of the patients and were analyzed using Life table analysis to estimate the overall relative survival rate, and by Kaplan-Meier analysis to indicate survival with reference to the disease stage and initial treatment, and by the Cox's proportional hazards model to investigate the interaction between variables on survival.

Results

Of the 167 patients with breast cancer studied, in all 39 patients were lost in the follow-up period. This led to analysis of data for the 128 remaining patients. The demographic and clinical data for the initial and the follow-up samples are shown in Table 1. The mean age of patients at diagnosis

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was 47.2 (SD= 13.5) years, most were married (69%) and presented with advanced disease (stage III = 33% and stage IV = 28%). Of these, at five years 79 patients were alive and 49 patients were dead. The mean survival time was 47.3 (SD = 19.0) months and using the life table analysis the overall 5-year relative survival rate was found to be 62% (SE = 0.04).

Performing the Kaplan-Meier analysis the 5-year survival was found to be lower in patients with advanced disease. The mean survival time for Stage I, II, III and IV patients was 56, 51, 46 and 42 months, respectively (Figure 1). Similar analysis by initial treatment as indicating factor showed that those who received neo-adjuvant treatment as their initial management had poorer survival. The mean survival times for mastectomy, breast conservation and neo-adjuvant treatment groups were 50, 48 and 25 months respectively (Figure 2).

Finally performing the Cox regression analysis after adjustment for age at diagnosis, initial treatment and cancer stage, it was found that initial treatment was the significant predictor of survival. The analysis indicated that the patients who received neo-adjuvant therapy had an increased risk of death (Hazard ratio = 4.5, 95% CI 2.20-9.44, P <0.0001) while age at diagnosis and cancer stage did not show significant results although a higher risk of death was observed in the expected directions (Table 2).

Table 1. Demographic and Clinical Characteristics of the Breast Cancer Patients

	Initial sample (n = 167)		Follow-up sample (n = 128)	
	Number	%	Number	%
Age group (years)				
Less than 30	18	11	10	7
30-39	35	21	32	25
40-49	47	28	38	30
50-59	31	19	21	17
60-69	25	15	18	14
More than 70	11	6	9	7
Educational level				
Illiterate	38	23	28	22
Primary	78	46	59	46
Secondary	33	20	26	20
College/university	18	11	15	12
Marital status				
Single	15	9	13	10
Married	116	69	88	69
Widow/divorced	36	22	27	21
Disease stage				
Stage I	16	9	10	8
Stage II	53	32	40	31
Stage III	53	32	42	33
Stage IV	45	27	36	28
Initial treatment				
Mastectomy	137	82	104	81
Conservative surgery	15	9	14	11
Neo-adjuvant therapy*	15	9	10	8

* Non-surgical treatment in advanced breast cancer patients.
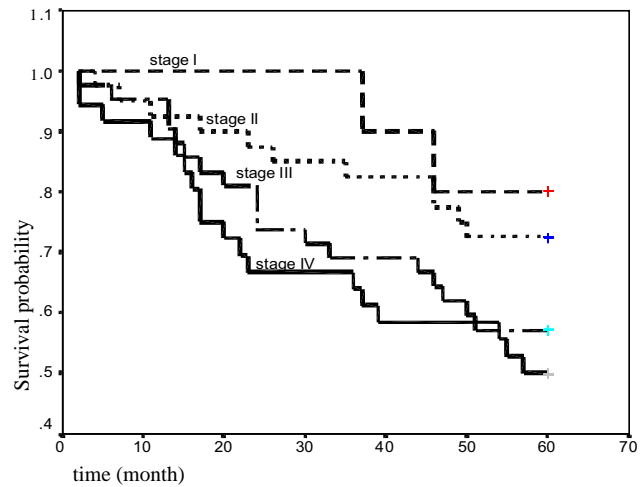
Figure 1. The Five-year Survival by Disease Stage
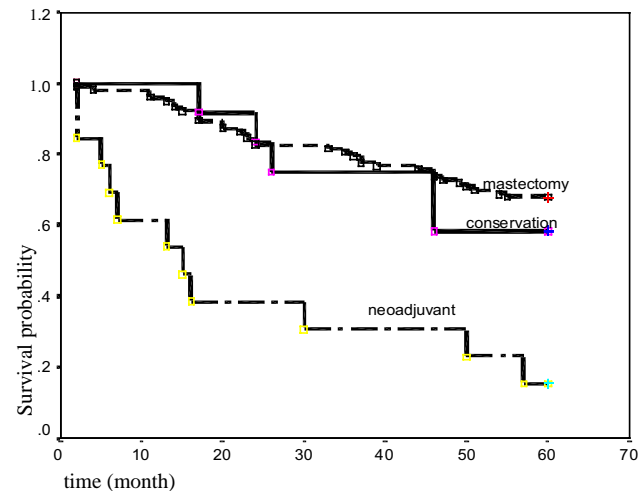
Figure 2. The Five-year Survival by Initial Management

Discussion

This was a prospective study of survival in breast cancer patients in Iran and the overall 5-year relative survival rate was found to be 62%. Since there is no population-based cancer registry in Iran the study was carried out based on

Table 2. The Results of the Cox Proportional Hazard Model

	HR*	95% CI	P
Age at diagnosis	0.99	0.97-1.01	0.6
Disease stage			
Stage I	1.0 (ref.)		
Stage II	1.3	0.30-6.31	0.67
Stage III	1.8	0.42-8.33	0.40
Stage IV	2.5	0.57-11.0	0.22
Initial treatment			
Mastectomy	1.0 (ref.)		
Conservative surgery	1.4	0.53-3.79	0.48
Neo-adjuvant therapy	4.5	2.20-9.44	< 0.0001

*Hazard ratio

data collected from a single institution and therefore the findings could not be generalized. However, the findings indicated that the overall relative survival in Iranian breast cancer patients was higher than some Asian and eastern European countries and was lower than the U.S and western European countries (Gajalakshmi et al., 1997; Jemal et al., 2004). A recent publication from a neighboring country also has reported similar results where the five-year survival was found to be 62% for breast cancer patients (Al-Moundhri et al., 2004).

The findings indicated that patients who received neo-adjuvant therapy as their initial management had poorer survival compared to those who received mastectomy or conservative surgery. This might be a true reflection of patients' clinical status where mostly presented with advanced disease (stage III = 33% and stage IV = 28%). Neo-adjuvant therapy is being used increasingly in the treatment of patients with large and locally advanced breast cancer to reduce the size of the primary tumor. It is argued that neo-adjuvant therapy in this group of patients can result in satisfactory local control and overall survival rates (Eltahir et al., 1998). However, it has been shown that patients with extensive nodal involvement after neo-adjuvant therapy have a very poor outcome (Pierga et al., 2000). Although we did not had information on nodal involvement, there is evidence that 70% of breast cancers in Iran present with lymph node involvement (Harirchi et al., 2004).

The findings did not show significant association between survival and age and disease stage. Almost all studies of survival in breast cancer indicate that age and stage are predictors of survival (Quinn et al., 1998; Grosclaude et al., 2001; Ugnat et al., 2004). We suspect that the power of the present study was low and thus it was not possible to detect the significant results between survival, age and disease stage. However, a higher hazard rate was observed for breast cancer patients with older age and advanced disease (Table 2). In addition the information on clinical status of the study sample was limited and therefore one might argue that if there were enough clinical information on histological grade or nodal involvement it was possible to arrive at different results. Furthermore evidence suggests that even specialist or non-specialist care might influence survival in breast cancer patients (Kingsmore et al., 2004). Unfortunately such information was not available for the present study.

In conclusion, the findings of the study suggest that overall relative survival rate in Iranian breast cancer patients stands between western and eastern European countries and needs to be improved. It seems that expansion of current preventive programs on breast cancer with more attention on public awareness; early detection and using standard treatment protocols might improve survival in Iranian breast cancer patients.

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