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Research Article

Risk factors of survival in breast cancer

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Abstract

Background: In this study, we aimed to investigate the role of prognostic factors on breast cancer survival in Iran.

Methods: This study was carried out using data from 500 participants with breast cancer. Data were gathered from medical records of patients referring to four breast cancer research centers in Esfahan, Iran, between 1990 – 2000. Age at diagnosis (year), size of tumor, Involve lymph nodes, tumor grade, and family history and married were the prognosis factors considered in this study. A Cox model was used.

Results: The median follow-up period was 29.71 months with the interquartile range of 19-61 months. During the follow-up period, 57 (10%) patients died from breast. The Cox model showed that number of lymph nodes involved, and the tumor size and grade tumor are the prognostic factors survival in breast cancer.

Conclusion: This study, confirmed the importance of early diagnosis of cancer before the involvement of lymph nodes and timely treatment could lead to longer life and increased quality of life for patients.

Introduction

Breast cancer is the second most common type of cancer after the lung cancer and the most common cause of death from cancer among women (24.2%, i.e. about one in 4 of all new cancer cases diagnosed in women worldwide are breast cancer). In Iran, the survival rate of breast cancer has been reported to be 70% [1]. Awareness of the prognostic factors associated with the survival in breast cancer plays an important role in the process of treatment and patient care. Stage of disease, number of involved lymph nodes, tumor size and grade, type of auxiliary are most important factors.

Family history is an important breast cancer risk factor, and one that can cause considerable anxiety to women. It is therefore important to measure the risk associated with it as much discriminatory power as possible, both to improve overall risk prediction and for advice and information for women, especially those with affected relatives. In assessing risk of breast cancer, the categorization of family history as a risk factor for breast cancer has ranged from presence or absence of a family history.

Divorced females showed increased risks for cancers of the larynx, breast, all parts of uterus and cervix uteri and a decreased risk for biliary tract cancer. The increased risk for breast cancer in single females was more pronounced in older age groups and the increased risks for several sites of cancer in divorced people were more pronounced in younger age groups.

Various studies have been performed in Iran to determine the factors affecting the survival in breast cancer patients and estimate the survival time [2-4]. However, the factors identified in each study have been different from other studies and the extent of the effects of some of these factors has also been controversial.

In this study, we used the patients' data from health center in Tehran to estimate the survival of breast cancer patients and determine the prognostic factors affecting survival of breast cancer, using the Cox model.

Materials and Methods

In this historical cohort study, the data set was collected as a secondary data and it contains information on 500 breast cancer patients, (based on the diagnosis of breast cancer pathology) referring to breast cancer research center in Esfahan, Iran, between 1990 – 2000 who completed the follow-up period. The median follow-up time was 29 months.

The survival time was defined as the duration (months) from diagnosis to death due to breast cancer. Age at diagnosis (year), size of tumor, family history, single or married women, the number of lymph nodes involved, grade of malignancy were the prognosis factors considered in this study.

Kaplan-Meier method was used to determine the survival rate at different time intervals. To investigate the effect of the prognostic factors, a Cox model was used. The proportional hazards assumption was investigated using a Schoenfeld residual test. The analysis was performed using STATA, version 12. The p-values < 0.05 were considered to be significant.

Results

500 patients were studied. During the follow-up period, 57 (10.9%) patients died from breast cancer. proportion (mean (standard deviation) for continuous variables) of the studied variables is presented in Table 1.

The mean (standard deviation) of age at diagnosis was 48.59 (0.59). The mean (standard deviation) of tomour size was 3.54 (0.07). The mean (standard deviation) of Involved lymph node was 4.98 (0.23). The mean (standard deviation) of grade was 2.12 (0.03).

The assumption of proportional hazards of Cox model was confirmed at the significance level of 0.05. The results of Cox model are provided in Table 2. Tumor size increased the hazard of death significantly. The increase in the number of involved lymph nodes increased the hazard of death. In the examination of the tumor grade, the hazard of death for patients with higher grade tumors was 2.61 times the lower grade tumor (Figure 1).

Discussion

In this study, we used the data collected from health center in Isfahan, Iran, to investigate the effect of prognostic factors of survival. The results obtained using the Cox model showed
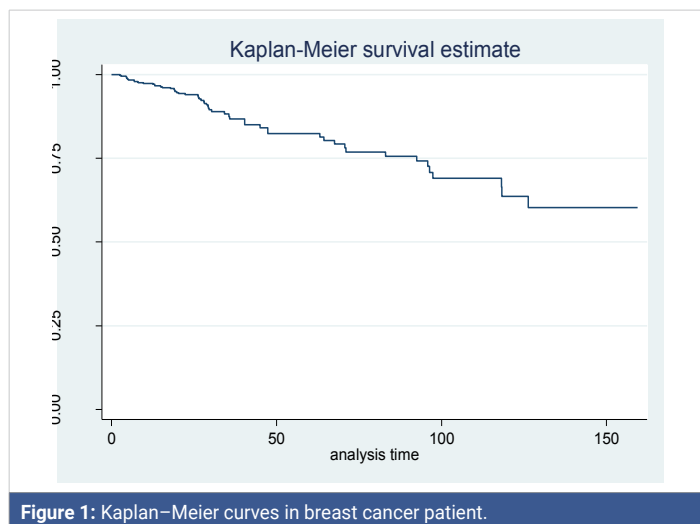

Figure 1: Kaplan−Meier curves in breast cancer patient.

that number of nodes involved, tumor size, tumor grade are the prognostic factors of survival in breast cancer.

In our study, more involved lymph nodes increased the hazard of death significantly. In Iran, in the study by Movahedi on 623 patients with breast cancer, involvement of lymph nodes was associated with a decrease in the survival rate of patients under study [5].

The size of tumor was significant that indicated an increase in tumor size increases the hazard of death. Many studies have identified these factors as risk factors for death in breast cancer [6,7]. In our study, tumor size was one of the effective factors in reducing the survival of breast cancer patients and increased the hazard of death by 0.98 times. In Iran, Rezaianzadah showed that tumor size to the bones and the lung increases the hazard of death by 2.25, 3.21 times [8]. In our study, grade tumor increased the hazard of death. Also, in other studies, higher grade tumor has been introduced as a prognostic factor for survival [7,9,10]. The average age of the patients was almost 50 years, which is similar to other studies in Iran that have reported an average age of breast cancer patients between 45 and 50 years [11], and this is lower than those in Western Europe and North America.

In our study married statuse was not significant. female patients with breast cancer were more frequently never married. The increased risk for breast cancer in single females was more pronounced. Single women had higher risk than married women.

Based on this study, number of lymph nodes involved, metastasis, the tumor grade are the prognostic factors survival in breast cancer. Consequently, early diagnosis of cancer before the involvement of lymph nodes and the onset of metastasis and timely treatment can lead to longer life and increase quality of life for patients.

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Table 1: Profile of Patient Demographics and Clinical Characteristic.

	Mean (P)	Std. Err.
Age	48.59	0.59
Size tomor	3.54	0.07
Family History	0.05	0.01
Married	0.92	0.01
Involved lymph node	4.98	0.23
Grade	2.12	0.03

Table 2: HR and 95% CI Prognostic Factors of Death from Cox Model.

	Haz. Ratio	Std. Err.	p-value	95% Conf. Interval
Age	0.99	0.01	0.706	0.97-1.01
Size tomor	0.96	0.07	0.007	0.84-1.10
Family History	1.30	0.79	0.657	0.40-4.27
Marid	3.42	2.66	0.113	0.74-15.71
Involved lymph node	1.01	0.11	0.049	0.96-1.06
Grade	2.61	0.63	<0.001	1.63-4.19

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