

The impact of multiple recurrences in disease-free survival of breast cancer: an extended Cox model

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ABSTRACT

Aims and background. Identifying the risk factors of recurrence of breast cancer is important for both the physician and patient. Analysis of the first recurrence may lead to an inaccurate evaluation of the factor's effects because it does not completely reflect the history of the disease and may result in the loss of valuable information. The present study aimed to determine the factors that influence breast cancer recurrence and to estimate disease-free survival, adjusting for multiple metastases in breast cancer patients.

Methods and study design. Patients were selected from a longitudinal study carried out at Fayazabakhsh Hospital in Tehran, Iran. Women who were diagnosed with breast cancer and who underwent either modified radical mastectomy or breast-conserving surgery between January 2006 and April 2008 were recruited to take part in the study. Breast cancer recurrence was defined as the occurrence of a tumor in the contralateral breast, local-regional relapse, or distant metastasis to other organs. Using an extended Cox model, the effect of age, tumor size, estrogen receptors, HER2, progesterone receptors as well as lymph node ratio was analyzed.

Results. Over a 5833 person-month follow-up, 25 of 133 patients (18.8%) had died and 108 patients (81.2%) were still alive, 9 of them with metastasis. Thirty-four patients (25.6%) experienced their first disease recurrence. A total of 11 patients had a second metastasis. The mean time to first metastasis was 19.93 months, and mean gap time between two metastases was 7.15 months. Risk of experiencing a metastasis or death in the third and fifth year after surgery was approximately 22% and 28%, respectively. Fitting multiple recurrent regression shows that high lymph node ratio, high histologic grade, large tumor size and HER2-positive tumors are prognostic factors for shorter disease-free survival.

Conclusions. Our novel approach might be helpful in clinical practice to predict breast cancer recurrence after surgery and might be adapted to be used in other malignancies as well.

Key words: breast cancer, disease free survival, longitudinal study, recurrent event.

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