Factors affecting estrogen receptor status in a multiracial Asian country: An analysis of 3557 cases


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Abstract

Estrogen receptor (ER) positive rates in breast cancer may be influenced by grade, stage, age and race. This study reviews the ER positive rates over a 15-year period at the University Malaya Medical Centre, Kuala Lumpur, Malaysia. Data on ER status of 3557 patients from 1994 to 2008 was analyzed. ER status was determined by immunohistochemistry with a cut-off point of 10%. ER positivity increased by about 2% for every 5-year cohort, from 54.5% in 1994-1998 to 58.4% in 2004-2008. Ethnicity and grade were significantly associated with ER positivity rates: Malay women were found to have a higher risk of ER negative tumors compared with Chinese women. Grade 1 cancers were nine times more likely to be ER positive compared with grade 3 cancers. In summary, the proportion of ER positive cancers increased with each time period, and ethnicity and grade were independent factors that influenced ER positive rates.

Introduction

Estrogen receptor (ER) status is an important predictive and prognostic factor in breast cancer. Epidemiologic studies have shown that the percentage of ER positive breast cancers has been increasing over time. The reason for this increase is unclear, but may be due to environmental factors. The risk factors responsible for ER or progesterone (PR) positive and ER or PR negative breast cancers appear to be different. ER positive breast cancers are associated with age at diagnosis and the use of postmenopausal hormone replacement therapy, but not with family history, benign breast disease, alcohol use, or height. Ethnicity also appears to be a factor in the occurrence of ER positive breast cancers.

The objective of this study is to analyze the trend in the proportion of ER positive breast cancers over a 15-year period at the University Malaya Medical Centre (UMMC), which is a tertiary hospital in Malaysia, a multiracial middle income country in Southeast Asia. Four factors, that is, ethnicity, age, stage and grade, were studied in relation to the rate of ER positive breast cancers.

Methods

The breast cancer registry at the UMMC was started in 1993, and data on demography, stage, pathological characteristics, treatment and outcome was prospectively entered into a database. From this hospital registry, data on ER status of 3557 patients over a 15-year period, from 1994 to 2008, was analyzed. Malays, Chinese and Indian ethnicities were included; other races were excluded. Non-epithelial cancers such as sarcomas and lymphomas were also excluded. The patients were divided into three 5-year study period cohorts, 1994–1998, 1999–2003 and 2004–2008. The ER status was retrieved from histopathology reports of the patients.

Routine ER immunohistochemistry was performed in the histopathology laboratory of the Department of Pathology, using the EnVision method (Dako Ltd, Denmark). The ER antibodies used over the course of the study were the 1D5 clone (Dako Ltd, Denmark) and the clone SP1 (Lab Vision Products, Thermo Scientific Fisher, Fremont, California, USA). Unstained tissue sections, approximately 4 microns