Maturitas 82 (2015) 365–370

Contents lists available at ScienceDirect

Maturitas

journal homepage: www.elsevier.com/locate/maturitas

Determinants of advanced stage presentation of breast cancer in 87,969 Brazilian women

Karen de Souza Abrahão[a], Anke Bergmann[b], Suzana Sales de Aguiar[c], Luiz Claudio Santos Thuler[d,*]

[a] Brazilian National Cancer Institute (INCA), Rio de Janeiro, Brazil
[b] Brazilian National Cancer Institute (INCA) and University Center Augusto Motta (UNISUAM), Rio de Janeiro, Brazil
[c] Brazilian National Cancer Institute (INCA), Rio de Janeiro, Brazil
[d] Brazilian National Cancer Institute (INCA) and Federal University of Rio de Janeiro State (UNIRIO), Rio de Janeiro, Brazil

ARTICLE INFO

Article history:
Received 8 May 2015
Received in revised form 23 July 2015
Accepted 24 July 2015

Keywords:
Breast cancer
Advanced stage
Epidemiology
Brazil
Hospital cancer registries

ABSTRACT

Background: Breast cancer is commonly diagnosed at an advanced stage in Brazil.
Aim: Analyze the determinants of advanced staging in Brazilian women with breast cancer.
Methods: Crosssectional study, including women diagnosed with breast cancer in Brazil, between 2000 and 2009.
Results: A total of 59,317 women were included, 53.5% being classified as advanced stage (≥IIB). Younger age (18 to 49 years old) (OR = 1.61 95% CI 1.51 to 1.72) or between 40 and 49 years old (OR = 1.08 95% CI 1.03 to 1.14), having low educational level (OR = 1.53 95% CI 1.48 to 1.58), living in less developed geographical regions (OR = 1.27 95% CI 1.21 to 1.33), having invasive ductal carcinoma (OR = 2.70 95% CI 2.56 to 2.84) and invasive lobular carcinoma (OR = 2.63 95% CI 2.42 to 2.86) were associated with advanced breast cancer.
Conclusion: We conclude that future interventions should focus on these high risk groups.

1. Introduction

Breast cancer is the cancer most commonly diagnosed among Brazilian women. After non-melanoma skin cancer, it is the leading cause of death by cancer among this group. A total of 57,120 new cases are estimated for the year 2015, with an estimated risk of 56.09 cases per 100,000 women [1].

In the national context, breast cancer has been diagnosed at a very advanced stage of the disease (clinical stage ≥III) in about 45% of cases, demonstrating the need for public health policies to reduce the delay in diagnosis and to improve early detection [2]. Using different criteria, another local study showed that in 51% of the women, diagnosis was at advanced stages (stages II–IV) [3]. In contrast, data from the US Surveillance Epidemiology and End Results (SEER) registry [4] and from the British Columbia Cancer Registry [5] showed that 40% and 44%, respectively, of women were diagnosed when in stages II–IV of the disease. Unfortunately, in both studies stages IIA and IIB were not analyzed separately, though these two groups appeared to represent different patient populations with different prognoses [6]. Tumor diagnosis at an advanced stage of disease and a lack of effective treatments increase the mortality rates from breast cancer [7,8].

Improvements in mammographic screening since the 1990s have been responsible for the increased rate of diagnosis of breast cancer at early stages and mortality reduction in many countries. There is no organized breast cancer screening in Brazil. In 2003, only 50% of all women older than 50 years had had at least one mammogram in their life. National guidelines recommending mammography screening at least every 2 years for women aged 50–69 years were therefore established in 2004 [9]. As a result, nationally, the percentage of women aged 50–69 years who reported receiving a mammogram in the past two years increased to 78.0% in 2013, but there are still wide regional differences in the country, and this rate ranges from 65% to 86% according to the city evaluated [10].

However, regardless of participation in screening programs, epidemiological factors may be associated with delayed diagnosis, including longer time interval between mammographic suspicion and biopsy, younger age, absence of consultation with a specialist health professional, belonging to an ethnic minority, lack of a part-

* Corresponding author.
E-mail addresses: karen.abrahao@gmail.com (K.d.S. Abrahão), abergmann@inca.gov.br (A. Bergmann), saguiar@inca.gov.br (S.S.d. Aguiar), lthuler@inca.gov.br (L.C.S. Thuler).

http://dx.doi.org/10.1016/j.maturitas.2015.07.021
0378-5122/

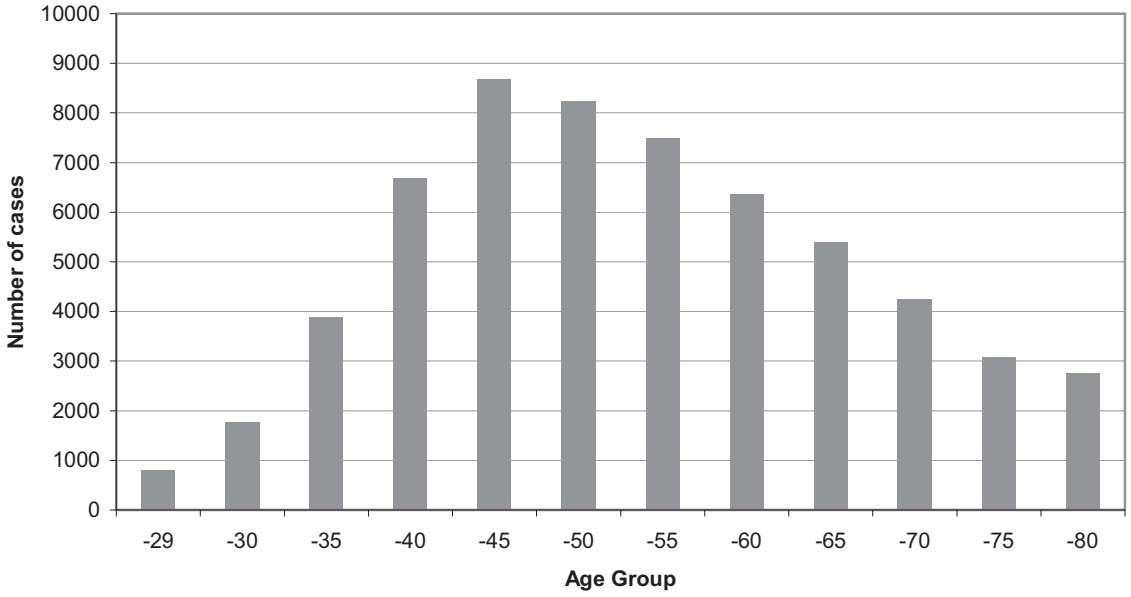

Fig. 1. Distribution of breast cancer by age at diagnosis in Brazil, 2000–2009

ner, living in socioeconomic disadvantage, having sociocultural and physical barriers to access primary care, and limited knowledge about breast care [3,6,7,11–16]. In addition, other factors, such as lack of access to health services, have been related to a delay in diagnosis [7,17,18].

Thus, this study aimed to analyze the determinants of advanced staging in Brazilian women with breast cancer. This knowledge may be useful for the implementation and adjustment of actions with the purpose of reducing morbidity and mortality from cancer in this population.

2. Materials and methods

We conducted a cross-sectional study using data from hospital cancer registries (HCR) in Brazil, derived from two different sources: the Integrator Module of HCRs (http://www.inca.gov.br) coordinated by the Brazilian National Cancer Institute, and the HCR of São Paulo State (www.fosp.saude.sp.gov.br) coordinated by Fundação Oncocentro of São Paulo (FOSP), encompassing hospitals that offer oncological services, located in the Federal District and in 25 of Brazil's 27 states. HCR cover about 90% of the Brazilian public health system, comprising 239 cancer centers in Brazil. As HCR collect information on cancer patients from a specific healthcare organization, they are not population based. Thus, they do not represent the Brazilian population. It is difficult to estimate how complete the case ascertainment is. Nevertheless, there is no possibility of overlap of the sources, since they include women who were diagnosed and treated in hospitals located in distinct states of the country.

This study included women diagnosed with breast cancer (International Statistical Classification of Diseases and Related Health Problems 10th Revision [ICD-10] – C50) between 2000 and 2009, for whom the hospital provided the initial diagnosis of cancer or for whom the hospital provided the first course of treatment, and women with complete information for clinical staging and educational level. Women younger than 18 years were excluded from the study. As the total population was analyzed, its large size ensured that the study was not underpowered.

The HCR electronic database includes demographic, epidemiological and clinical variables. The clinical staging of disease at diagnosis, defined by the Classification of Malignant Tumors (TNM), was considered the outcome. Thus, the sample was grouped into two categories: early stage (≤IIA) and advanced stage (≥IIB). That is, invasive tumors of stages IIB, III, and IV were considered to be advanced-stage disease, which is in accordance with the American Joint Committee on Cancer [19]. Other data available from the HCR were analyzed as independent variables: age was categorized as 18–39, 40–49, 50–69 and >70, to account for an expected increase in access to mammography for women age 40–49 and 50–69; self-reported race/ethnicity, classified according to the National Census Bureau—IBGE (white, black, Asian Brazilians, mulatto, indigenous), later categorized as white and 'other'; histology type, categorized as invasive ductal carcinoma (IDC), invasive lobular carcinoma (ILC), and 'other' (referring to other histological types according to the International Classification of Diseases for Oncology - ICD-O); educational level, categorized as ≤7 years (up to primary education) and ≥8 years of formal education (secondary education or more); marital status, categorized as with a partner (married or in a stable relationship) or without a partner (widowed, divorced or single); current alcohol consumption (more than three times per week, independent of the amount consumed); habitual use of tobacco and its derivatives, categorized as consumer and non-consumer; region of residence, dichotomized into more developed regions (South and Southeast) and less developed regions (North, Northeast and Midwest); and year of diagnosis. Missing cases were identified in descriptive tables.

For data analysis we used the SPSS statistical software (Statistical Package for the Social Sciences) version 20.0. The analysis was performed using means ± standard deviation (SD) for continuous variables and percentages for categorical variables. Odds ratios (OR) with 95% confidence intervals (CI) were calculated by both univariate and multivariate logistic regression. Multivariate logistic regression used the stepwise forward method, and variables with a p value < 0.20 in univariate analyses were introduced in the model. Statistically significant differences were defined as $p < 0.05$.

This study was approved by the Ethics Committee in Research of the National Cancer Institute José Alencar Gomes da Silva, according to Resolution 196/96 under number CEP - 128/11, CAAE - 0104.0.007.000-11.