Breast cancer incidence and mortality in women under 50 years of age in Brazil

Incidência e mortalidade por câncer de mama em mulheres menores de 50 anos no Brasil

Incidencia y mortalidad por cáncer de mama en mujeres menores de 50 años en Brasil

Sabrina da Silva Santos [1]
Leticia Rodrigues Melo [1]
Rosalina Jorge Koifman [1]
Sergio Koifman [1]

[1] Escola Nacional de Saúde Pública Sergio Arouca, Fundação Oswaldo Cruz.

Correspondence
S. S. Santos
Escola Nacional de Saúde Pública Sergio Arouca, Fundação Oswaldo Cruz.
Rua Leopoldo Bulhões 1480, Rio de Janeiro, RJ 21041-210, Brasil.
sabrina_ssantos@hotmail.com

Abstract

Many countries have reported an increase in breast cancer incidence in young women. The current study's objective was to explore breast cancer distribution in women less than 50 years of age in Brazil. A descriptive study on breast cancer incidence (selected cities) and mortality (Brazil and selected cities) in 2002-2004 was carried out, and the results were compared with those from other countries. The study also analyzed the trend in hospital morbidity and incidence rates for breast cancer. Porto Alegre (Rio Grande do Sul State) showed the highest incidence rates (17.9 and 165.5/100,000 in the 15-39 and 40-49-year age strata, respectively). Regarding mortality, Belo Horizonte (Minas Gerais State) showed the highest rate in the 15-39-year group and Porto Alegre in the 40-49-year group (2.8 and 25.5/100,000). Hospital admissions and incidence rates for breast cancer suggest a change in epidemiological distribution. The results reveal an epidemiological pattern of breast cancer in young Brazilian women with regional distribution characteristics.

Breast Neoplasms; Incidence; Mortality; Women

Resumo

Um aumento na incidência de câncer de mama em mulheres jovens tem sido relatado em diversos países. O objetivo foi explorar a distribuição do câncer de mama em mulheres menores de 50 anos, no Brasil. Foi realizado um estudo descritivo da incidência (capitais selecionadas) e da mortalidade (Brasil e capitais selecionadas) por câncer de mama, no período de 2002-2004, sendo os resultados comparados com aqueles observados em outros países. Adicionalmente, analisou-se a evolução da morbidade hospitalar e das taxas de incidência. Porto Alegre (Rio Grande do Sul) possui as maiores taxas de incidência (17,9 e 165,5/100 mil, 15-39 e 40-49 anos, respectivamente). Em relação à mortalidade, Belo Horizonte (Minas Gerais) possui a maior taxa de 15-39 anos e Porto Alegre de 40-49 anos (2,8 e 25,5/100 mil). A proporção de hospitalizações do SUS e as taxas de incidência de câncer de mama sugerem um processo de mudança na distribuição epidemiológica. Os resultados retratam um padrão epidemiológico do câncer de mama em mulheres jovens no Brasil com características regionais de distribuição.

Neoplasias da Mama; Incidência; Mortalidade; Mulheres

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Introduction

Breast cancer represents the cancer site with the highest incidence and is the leading cause of death from cancer among women worldwide [1], with an estimated 1.38 million new cases diagnosed in 2008 (23% of all cancers) [2]. In Brazil, estimated cancer incidence in 2013 shows an expected 52,680 new cases of female breast cancer (52 cases per 100,000 women) [3].

The natural history of breast cancer points to an increase in incidence rates of this disease with increasing age, expressed as higher incidence rates in post-menopause [2]. In pre-menopause, breast cancer is described in the literature as usually an atypical disease in the absence of a history of family clustering of breast and/or ovarian cancer [4]. Members of families affected by hereditary syndromes for these neoplasms may have a 40 to 80% risk of developing breast cancer, as in individuals with specific mutations in the *BRCA1* or *BRCA2* genes [5]. Mutations in these genes, with autosomal dominant inheritance, are responsible for the so-called hereditary breast-ovarian cancer syndrome [6]. Mutations in the *TP53* gene in families with Li-Fraumeni and Li-Fraumeni-like syndrome [7] and in the *PTEN* gene in families with Cowden syndrome [8] are rare, but when they occur they are also associated with high risk of breast cancer at young ages [9].

Thus, sporadic cases of breast cancer, i.e., in the absence of a history of family clustering of the disease, in young women (under 40 years) can be considered atypical. However, the literature includes reports from the last two decades on increasing breast cancer incidence and mortality in young women in various parts of the world [10,11,12,13,14,15]. Brazil, for example, showed significant increases from 1998 to 2003 in the percentage of hospital admissions for breast cancer in women up to 29 years of age in the states of São Paulo, Rio de Janeiro, Minas Gerais, and Espírito Santo [16] and from 1988 to 2003 in the incidence rate for this cancer in women 30-49 years of age in the city of Goiânia (Goiás State) [17].

Some studies also suggest that this increasing breast cancer incidence in young women is occurring in the absence of family clustering. Thus, a case-control study in women under 36 years of age diagnosed with breast cancer in Rio de Janeiro found that 70.9% (95%CI: 61.4-79.0) of cases were sporadic [18]. This high percentage of young women with sporadic breast cancer suggests that the rise in breast cancer rates in this group, which appears to be happening in Brazil, may reflect a change in the distribution patterns for this neoplasm.

The current study aimed to conduct an exploratory analysis of the distribution of breast cancer incidence and mortality in women less than 50 years of age in recent decades in Brazil, seeking to collect evidence to document changes in the distribution pattern for the disease in the country.

Material and methods

Study design

A descriptive study was conducted on the distribution of breast cancer incidence rates (selected cities) and hospital morbidity and mortality (Brazil and selected cities) in women under 50 years of age in Brazil from 2002 to 2004, performing an internal comparison of the data and with rates observed in other countries. A random selection of countries was performed, covering all the continents. We selected the period with the most recent data published by the Brazilian Population-Based Cancer Registries (RCBP). A descriptive study was also performed with the trend in breast cancer incidence rates in the selected state capitals, using the entire period available for each of the population-based cancer registries.

Analysis of incidence

Data on breast cancer incidence were obtained from the RCBPs (Instituto Nacional de Câncer. Registros de câncer de base populacional. http://www2.inca.gov.br/wps/wcm/connect/estatisticas/site/home/rcbp/, accessed on 01/Nov/2011) for the Brazilian state capitals that have such registries and that met the following data quality criteria: > 75% of cases with microscopic confirmation (histological, cytological, or hematological); < 20% of cases notified only by death certificate; < 5% malignant neoplasms without specification of site (C80); and < 15% cases with age unknown [19]. The study thus included and analyzed data on breast cancer incidence from the cities of São Paulo, Porto Alegre (Rio Grande do Sul), João Pessoa (Paraíba), Goiânia (Goiás), Fortaleza (Ceará), Cuiabá (Mato Grosso), Belo Horizonte (Minas Gerais), and Aracaju (Sergipe).

Breast cancer incidence rates were first calculated by age stratum (15-39 and 40-49 years) for 2002-2004. These data were compared with breast cancer incidence reported by GLOBOCAN 2008 [2] in women of the same age strata in selected countries.

The temporal distribution of breast cancer incidence rates was then analyzed for the entire period covered by each of the registries (1988-

2008) according to age stratum (20-39 and 40-49 years) using Poisson (log) regression. Incidence rate (per 100,000 women) was analyzed as the dependent variable and the centralized calendar year as the independent variable, considering continuous variance throughout the period. The study used Joinpoint 3.5.2 (http://www.cancer.org) to calculate the average annual percent change (AAPC) in the target distributions. This specific analysis excluded the cities of Belo Horizonte and Cuiabá, since they had short data series (2000-2004 and 2000-2005, respectively).

The variation in incidence for a given age stratum and location used as the parameter for comparison the incidence rate observed at the initial period of the respective series.

Hospital morbidity

Hospital morbidity data were obtained from the databank of the Information Technology Department of the Brazilian Unified National Health System (DATASUS. http://www.datasus.gov.br/DATASUS/index.php, accessed on 01/Nov/2011), where the proportions of hospital admissions for breast cancer were calculated using as the denominator the total number of admissions in the Brazilian Unified National Health System – SUS (excluding childbirth and postpartum) for the same age stratum. The proportional rates of hospital admissions due to breast cancer were calculated for women by age stratum (20-39 and 40-49 years) for Brazil as a whole and in the same above-mentioned cities, for three different periods (1995-1999; 2000-2004, and 2005-2009).

For Brazil and each of the state capitals included in the study, the percentage variation in hospital morbidity was calculated comparing the final period (2005-2009) to the initial period (1995-1999) for the same age stratum and location. The median of the variations in hospital morbidity was then calculated for the set of selected state capitals.

Mortality analysis

Breast cancer mortality data were obtained from the databank of the SUS for Brazil as a whole and in the same cities analyzed for incidence. The analysis used codes C50.0 to C50.9 (malignant neoplasm of breast) of the International Classification of Diseases, 10th Revision (ICD-10).

We began by calculating the mortality rates for the 15-39 and 40-49-year age strata in 2002-2004. This period was chosen because it was the same one used to analyze incidence, thus allowing comparison of the two indicators (mortality and incidence). These rates were then compared to those from selected countries using data from GLOBOCAN 2008 [2].

Population data

The population of women living in each selected city was obtained from DATASUS, using the population censuses from 1980, 1991, and 2000, the 1996 population count, and inter-census projections (1981-2009). These populations were used to calculate the incidence and mortality rates for each target age group.

Results

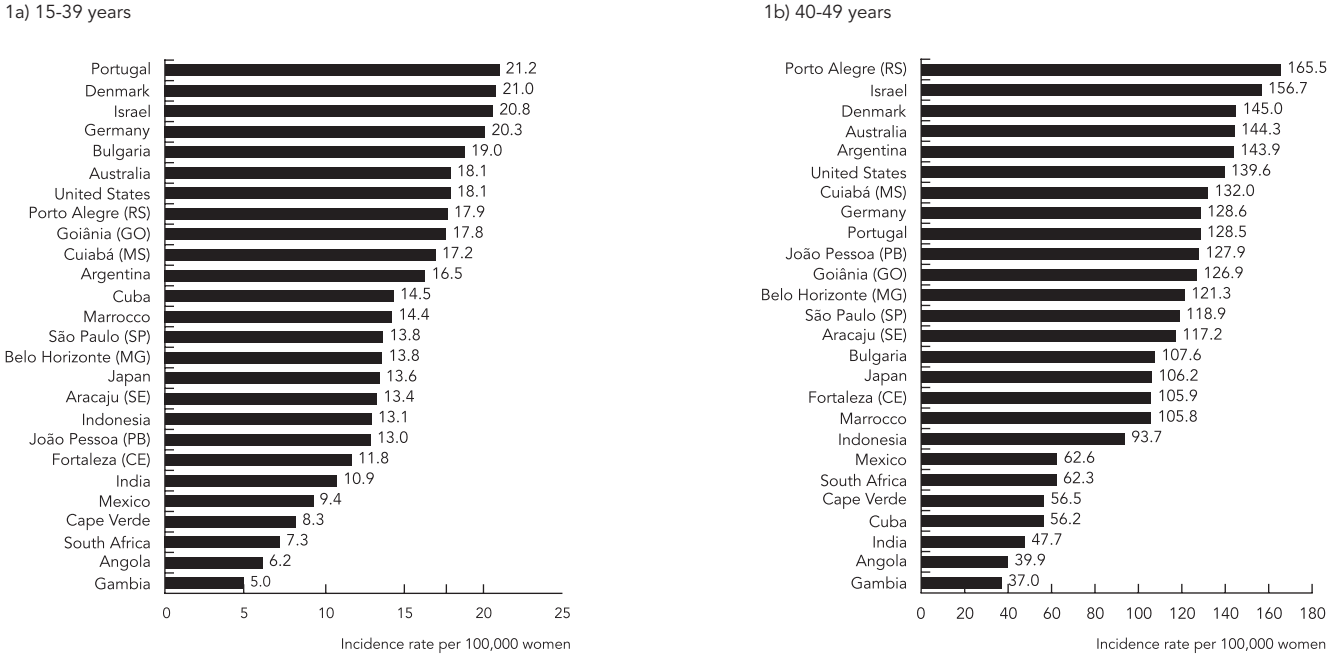
Analysis of breast cancer incidence in the selected Brazilian state capitals in 2002-2004 showed that the highest rates in the 15-39-year stratum were in Porto Alegre (17.9/100,000), Goiânia (17.8/100,000), and Cuiabá (17.2/100,000). Comparison of the incidence rates in Brazilian state capitals with those from various countries in the year 2008 for the 15-39-year stratum [2] showed that the highest rates were in Portugal (21.2/100,000) and Denmark (21.0/100,000). The incidence rates in Porto Alegre and Goiânia were similar to that of the United States (18.1/100,000), while São Paulo (13.8/100,000), Belo Horizonte (13.8/100,000), and João Pessoa (13.0/100,000) had intermediate rates, similar to those of Japan (13.6/100,000) and Indonesia (13.1/100,000). Fortaleza was the Brazilian city with the lowest incidence rate (11.8/100,000), while the countries described with the lowest rates were Angola (6.2/100,000) and Gambia (5.0/100,000) (Figure 1).

Among women 40-49 years of age, Porto Alegre showed the highest rate (165.5/100,000) of all the selected Brazilian cities, higher than Israeli women from the same age stratum (156.7/100,000). Cuiabá (132.0/100,000), João Pessoa (127.9/100,000), Goiânia (126.9/100,000), Belo Horizonte (121.3/100,000), São Paulo (118.9/100,000), and Aracaju (117,2/100,000) showed intermediate rates, similar to those of Germany (128.6/100,000) and Portugal (128.5/100,000). Fortaleza was the Brazilian city with the lowest incidence in the 40-49-year stratum (105.7/100,000), but this rate was higher than the lowest rate in the countries analyzed, 37.0/100,000 in Gambia (Figure 1).

Table 1 shows the trend in breast cancer incidence rates in the 20-39 and 40-49-year strata for the periods provided by the cancer registries. The 20-39-year stratum shows a statistically significant increase in annual variation in incidence rates in Porto Alegre in 1993-2005 (AAPC: 4.6;

Figure 1

Breast cancer incidence in women 15 to 49 years of age in Brazil (selected state capitals, 2002-2004) and other countries (2008).



Brazilian states: CE: Ceará; GO: Goiás; MG: Minas Gerais; MS: Mato Grosso do Sul; PB: Paraíba; RS: Rio Grande do Sul; SE: Sergipe; SP: São Paulo.

Table 1

Average annual percent change (AAPC) in breast cancer incidence rate by age stratum in selected Brazilian state capitals, 1988-2008.

City, State	Period	20-39 years		40-49 years	
		AAPC	95%CI	AAPC	95%CI
São Paulo, São Paulo	1997-2008	0.8	-2.5; 4.3	-1.1	-3.1; 1.0
Porto Alegre, Rio Grande do Sul	1993-2005	4.6 *	0.8; 8.4	2.9	-1.3; 7.3
João Pessoa, Paraíba	1999-2006	-3.4	-15.1; 9.8	1.7	-0.6; 4.1
Goiânia, Goiás	1988-2008	4.4 *	2.8; 5.9	2.4 *	0.3. 4.6
Fortaleza, Ceará	1990-2006	1.0	-2.1; 4.3	0.0	-2.0; 2.0
Aracaju, Sergipe	1996-2004	0.5	-8.8; 10.7	4.6	-4.2; 14.2

* AAPC significantly different from zero.

95%CI: 0.8-8.4) and Goiânia in 1988-2008 (AAPC: 4.4; 95%CI: 2.8-5.9). In the 40-49-year stratum, this increase was only seen in Goiânia in 1998-2008 (AAPC: 2.4; 95%CI: 0.3-4.6).

Analysis of hospital admissions for breast cancer in the SUS in 1995-2009 shows stability over time in the distribution of hospitalizations in the selected cities, with a median of -7.9% in the 20-39-year stratum when comparing 2005-2009 to 1995-1999. However, the city of Fortaleza showed a rise in the proportion of hospital admissions in this age stratum. Women 40-49 years of age showed a steady increase in hospital admissions from breast cancer in Brazil as a whole,

as well as in seven of the eight selected cities, especially Fortaleza, Aracaju and Belo Horizonte (Figure 2). In these, the median variation from the first to the second period was 33.9%.

Breast cancer mortality in women 15-39 and 40-49 years of age in Brazil and in the selected cities in 2002-2004 was compared to mortality in 2008 [2] in the same countries used to compare incidence (Figure 3). Morocco had the highest breast cancer mortality rates in both age strata (4.5 and 44.3/100,000 for the 15-39 and 40-49-year strata, respectively). In the 15-39-year age group, among the selected Brazilian cities, Belo Horizonte had the highest mortality rate (2.8/100,000), similar to that of Portugal. The lowest mortality rate in this age group was in João Pessoa (1.3/100,000), similar to Gambia (1.4/100,000).

In the 40-49-year age stratum, Brazil had the same breast cancer mortality rate reported in Germany (17.3/100,000). Among the selected Brazilian cities, the highest rates were in Porto Alegre (25.5/100,000), São Paulo (23.2/100,000), and Goiânia (21.4/100,000), and the lowest was in Cuiabá (12.9/100,000).

Discussion

Like other types of cancer, breast cancer is a multi-factorial disease that results from various genetic and environmental factors [20]. Estrogen exposure is one of the most important risk factors for breast cancer, and the increasing risk of the disease with age results partly from the extended time of hormone exposure [21,22]. Considering the distribution of cases according to presence of family history in different populations, the majority consists of sporadic cases (with no family history), while cases with family clustering account for approximately 5% of all cases of breast cancer [23,24]. About one half of these families have mutations in the *BRCA1* and *BRCA2* genes, constituting the so-called hereditary breast-ovarian cancer syndrome [6], which can generate a lifetime risk of up to 80% for developing breast cancer [5]. In addition to these, mutations have been identified in other genes capable of increasing breast cancer risk, generating familial clustering and carcinogenesis in young women [9]. In the absence of family history, until recent decades breast cancer in pre-menopause was considered a relatively atypical event, especially in women under 40 years.

According to estimates, in the world, pre-menopausal women (15-49 years) accounted for 33% of all new breast cancer cases in 2008 and 24% of all deaths from this neoplasm in women [2]. In Brazil, breast cancer is also the leading cause of death in women 15-49 years of age (DATASUS. http://www.datasus.gov.br/DATASUS/index.php, accessed 01/Nov/2011).

In addition, published reports have suggested an increase in breast cancer incidence and mortality in young women from different populations in various parts of the world. Cardona & Agudelo [14] observed an upward trend in breast cancer mortality rates in women 20-44 years of age from 1994 to 2003 in Medellin, Colombia, although the mortality rates from this cancer in women 45-64 years of age remained constant in Colombia during the same period. An increase in breast cancer mortality rates was also observed in Iran from 1995 to 2004, and was greater in women 15-49 years of age compared to 50 years or older [15]. Recently, Wu et al. [10] detected a statistically significant increase in breast cancer incidence in women 15-49 years of age from 1973 to 2005 in Shanghai, China, with an AAPC of 2.9 (95%CI: 2.5-3.4). In the United States, a study by Johnson et al. [11] in women 25-35 years of age showed a statistically significant increase in breast cancer incidence with metastases to other organs (bones, brain, lungs, etc., excluding adjoining areas such as lymph nodes and chest wall) at diagnosis, from 1976 to 2009 (AAPC: 2.07; 95%CI: 1.57-2.58), but without a corresponding increase in older women. Additionally, an increase in breast cancer incidence was seen in France (1991-2003) in women up to 49 years of age [12] and in Spain (1980-2004) in women 25-44 years of age [13].

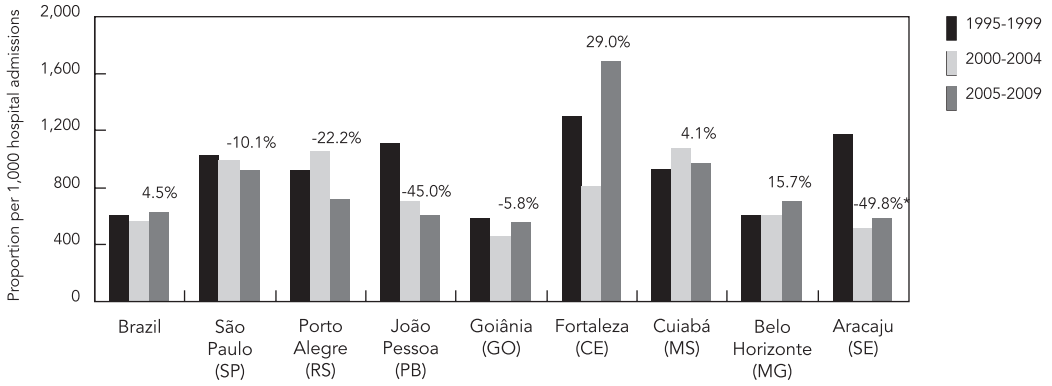
The current study sought to explore evidence that allowed confirming or refuting changes in the epidemiological distribution of breast cancer in pre-menopausal Brazilian women. Women 20-39 years of age showed some homogeneity in the magnitude of incidence comparing selected Brazilian state capitals analyzed in 2002-2004, with rates that were comparable to some of the highest in the world. This pattern was maintained in the 40-49-year stratum, and the incidence rate in this age group in Porto Alegre was even one of the highest in the world, higher than in Israel, where the presence of Eastern European (Ashkenazi) Jewish families is associated with the high incidence of pre-menopausal breast cancer cases with family clustering [25,26]. Although displaying somewhat lower incidence rates, the cities of Goiânia, João Pessoa, Belo Horizonte and Aracaju were situated on an intermediate level, approximately twice as high as the incidence in Cuba in 2008.

More than 411,000 deaths per year from breast cancer occur in the world, accounting for more than 1.6% of deaths from all causes among females [1]. However, in the last two decades breast cancer mortality has decreased in developed

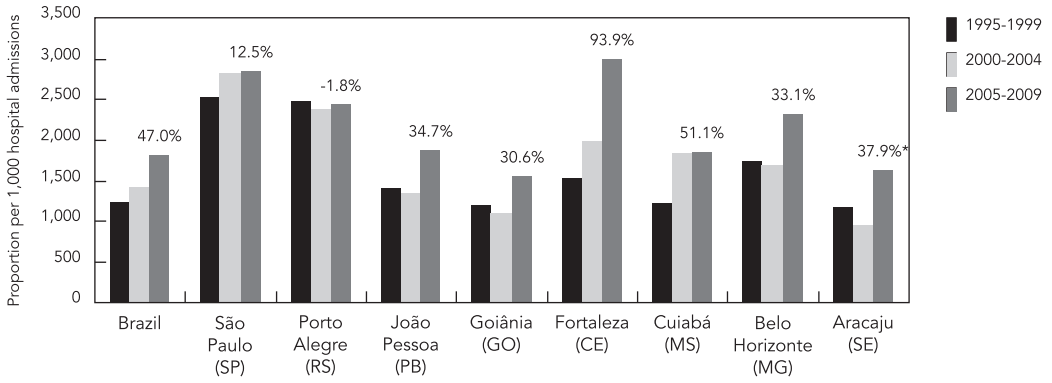
Figure 2

Proportion of hospital admissions due to breast cancer in the Brazilian Unified National Health System (SUS) according to age stratum. Brazil and selected state capitals, 1995-2009.

2a) 20-39 years



2b) 40-49 years



Brazilian states: CE: Ceará; GO: Goiás; MG: Minas Gerais; MS: Mato Grosso do Sul; PB: Paraíba; RS: Rio Grande do Sul; SE: Sergipe; SP: São Paulo.

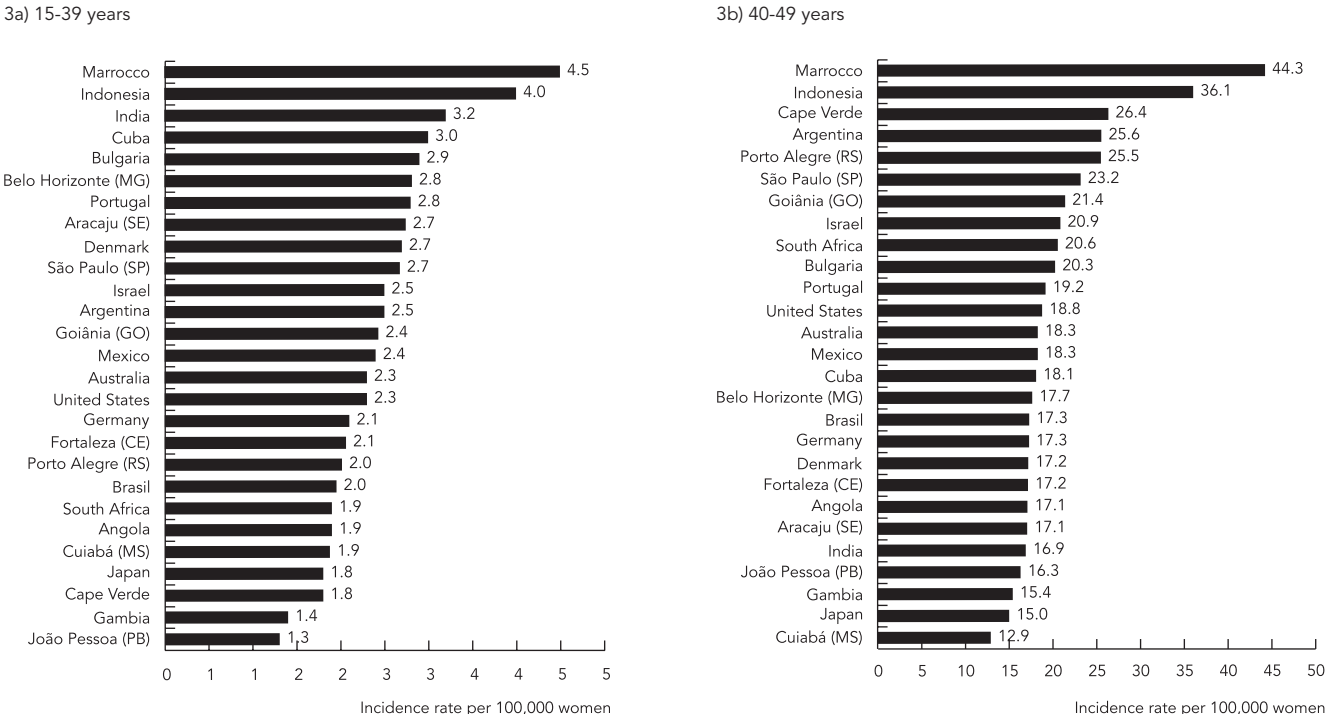
* Percent variation in the final period (2005-2009) compared to the initial period (1995-1999).

countries due to early diagnosis and treatment. In most of Europe and in some countries of the Americas, mortality rates remained relatively stable from 1960 to 1990, followed by a significant decline reaching 25-30% in Northern Europe and the United States [1,27]. However, in developing countries, breast cancer mortality rates are still disproportionately high. The ratio between mortality and incidence rates in pre-menopause, which is 0.35 in the world, varies from 0.19 in North America to 0.69 in Africa [28]. This disparity can be attributed mainly to inadequate health systems in the underdeveloped or developing countries, which interfere in cancer mortality and survival rates in these countries [29]. According to CONCORD, an international population-based study in 31 countries aimed at determining cancer survival in individuals 15-99 years of age diagnosed in 1990-1994, age-adjusted five-year survival from primary breast cancer varied from 80% or more in North America, Sweden, Japan, Finland, and Australia to less than 40% in Algeria. In Brazil, estimated five-year survival in Goiânia was 65.4% [30].

Breast cancer survival in young women (up to 40 years) can be even lower, since some studies in the literature report that breast cancer in these

Figure 3

Breast cancer mortality in women 15 to 49 years of age in Brazil (selected state capitals, 2002-2004) and other countries (2008).



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women displays more aggressive tumor behavior and worse prognosis than that diagnosed in older women [31,32]. This can be partly explained by the fact that young women generally present more advanced breast cancer staging at the time of diagnosis, higher prevalence of axillary lymph node involvement, less differentiated tumors, higher cell proliferation rate, and higher cancer relapse rate [32,33]. In addition, breast cancer of the so-called triple-negative molecular type, defined as not expressing estrogen, progesterone, or human epidermal growth factor receptors, frequently affects younger patients. This subtype is significantly more aggressive than tumors belonging to other molecular subgroups [34].

Our data show that breast cancer mortality rates in Brazilian cities in 2002-2004 differed little from rates in other countries in 2008, especially in the 15-39-year age stratum. The comparison of incidence rates with breast cancer mortality shows that some Brazilian cities with high incidence rates have relatively lower mortality, shifting positions in the order among the selected cities. Thus, in the 15-39-year age stratum, Porto Alegre, the city with the highest incidence rate, had the sixth highest mortality rate, and Cuiabá, with the third highest incidence, had the seventh highest mortality. In the 40-49-year stratum, the same occurred in Cuiabá (second in incidence and eighth in mortality) and João Pessoa (third in incidence and seventh in mortality). The opposite was true for Belo Horizonte (fifth in incidence and first in mortality) and Aracaju (sixth in incidence and second in mortality) in the 15-39-year stratum. In the 40-49-year group, São Paulo had the sixth highest incidence rate and the second highest mortality rate, while Fortaleza was eighth in incidence and fifth in mortality in both age groups. The situation in Brazilian cities with high incidence rates but without elevated mortality rates may suggest early diagnosis and adequate treatment for women with breast cancer.

The current study also showed an increase in the variation of breast cancer incidence rates based on AAPC, exceeding 4% per year in 1988-

2008 in Porto Alegre and Goiânia in the 20-39-year stratum and in Aracaju in the 40-49-year stratum. Most of the other target populations also showed increases in AAPC, although smaller and not statistically significant, but jointly suggesting a scenario of increasing breast cancer incidence in young Brazilian women. An upward trend in breast cancer incidence in women under 39 years of age would not be expected. This age stratum has been described as having low incidence of this neoplasm, since sporadic cases would be unusual, as opposed to those with a history of family clusters, representing about 5% of all breast cancer cases [23,24]. The reported increase in breast cancer incidence in various countries, including Brazil, is thus worrisome, since it may reflect a rise in sporadic neoplasms resulting from new environmental exposures in recent decades.

Breast cancer morbidity was estimated from proportions of hospital admissions for breast cancer in the SUS, an indicator that has advantages and disadvantages. Among the latter, the same patient can be admitted several times, and admissions through the SUS can result from the availability of hospital beds, especially for specialized care. On the other hand, the analyses used as the data source the series of patients according to place of residence rather than the municipality in which the hospitalization occurred. Secondly, the indicator's possible imprecision is not differential, affecting all the population groups that were analyzed, thus translating as relatively stable patterns in the gradient of hospital admissions for breast cancer in the various cities, although with decreased precision. In addition, although the data refer only to admissions in public hospitals or private ones outsourced by the SUS, it is important to highlight the system's wide coverage for cancer care in the country, especially in cities in the Northeast and Central-West regions. Finally, since data from the SUS constitute one of the few sources that allow nationwide monitoring of breast cancer morbidity, we value the use of such data, while recommending caution in their interpretation as approximations of the true levels of breast cancer morbidity. Analysis of the proportions of hospital admissions for breast cancer according to age stratum showed an upward trend in the country as a whole and in the selected cities in the 40-49-year stratum, especially in the Northeast.

Taken as a whole, these data on breast cancer incidence and hospital morbidity can be interpreted as suggesting a change underway in the epidemiological distribution of breast cancer in women under 50 years of age in Brazil. The analysis of six state capitals with cancer registries that display quality indicators internationally defined as adequate showed an upward trend in breast cancer incidence in at least one of the target age strata, ranging from 0.5 to 4.6% per year. The analysis of these cities, located in different geographic regions of the country, with robust population contingents, varying from 142 thousand to 2,792,000 women 20 to 49 years of age (2008), makes it unlikely that the observed changes in the trend would result from random fluctuations. Additionally, the observed annual changes in breast cancer incidence rates do not appear to be associated with socioeconomic conditions, as observed when comparing cities with similar mean income but different percent changes, such as São Paulo (+0.8%) and Porto Alegre (+4.6%) in women less than 40 years of age, or Fortaleza (0.0%) and Aracaju (+4.6%) in the 40-49-year stratum.

It is unlikely that this increase in incidence can be explained mainly by expansion in diagnosis of the disease, given that young women are not targeted in public policies for breast cancer screening. The Brazilian Ministry of Health recommends as the principal strategies for population screening a mammogram at least once every two years in women 50-69 years of age and annual clinical breast examination (CBE) in women 40-49 years of age. CBE should be performed in all women that come to health services, regardless of the age stratum, as part of comprehensive women's health care. For women in population groups considered at high risk for breast cancer (family history of breast cancer in first-degree relatives), annual CBE and mammogram are recommended starting at 35 years of age [35].

If the increase in breast cancer incidence is confirmed in young women as described, it is plausible that it results from changes in lifestyle and reproductive history in Brazilian women in recent decades. Such changes also occur in other populations (especially in developing countries) and alter the prevalence of known risk factors for breast cancer [36]. These factors include early menarche, delayed age at first pregnancy, nulliparity or fewer gestations, decreased breastfeeding duration, increased sedentary lifestyle and obesity, changes in eating habits, and greater alcohol consumption by women [37,38]. One point in common among the majority of these risk factors is the increase in excessive estrogen exposure [21], which has raised the hypothesis that the growing use of contraceptives at increasingly early ages and extending for longer periods may also be a risk factor for the disease [39,40].

A breast cancer diagnosis in a young woman suggests that exposure to risk factors began early in life or even in the intrauterine phase. Epidemiological studies suggest that factors leading to

greater exposure to estrogenic substances during fetal development or early childhood can influence the future risk of breast carcinogenesis [41]. These include exposure to estrogen agonists (endocrine disruptors) [42], including organochlorine pesticides [43], bisphenol-A [44], and others. However, none of these compounds has been conclusively associated with increased risk of breast cancer [45].

The study's limitations mainly include the limited time available for analyzing incidence according to the cancer registries and the data quality. To minimize the latter, the registries used in this study were selected according to quality indicators set by the International Agency for Research on Cancer (IARC).

The limitations of the mortality data include coverage and reliability of the completion of death certificates, especially in the poorer regions of Brazil. However, several studies have evaluated the reliability and validity of death certificates for cancer patients in Brazil by comparing reported versus true causes of death, and have indicated high reliability for cancer mortality [46,47].

The study's results depict an epidemiological pattern of breast cancer in young women in Brazil with regional distribution characteristics. The characteristics show a pattern in the magnitude of Brazilian incidence and mortality rates that is similar to those described as high or intermediate in other countries. They also point to a scenario resulting from a process of change in the epidemiological distribution of breast cancer in women less than 50 years old in Brazil, with an apparent increase in breast cancer incidence rates in this age group in most of the state capitals that were analyzed. Finally, the possibility that such changes are actually true is consistent with similar processes described in other countries [10,11,12,13,14,15].

The possible increase in breast cancer incidence in pre-menopausal Brazilian women highlights the need for closer monitoring of the disease in these women, calling the attention of health professionals to early diagnosis, control of exposure to known risk factors, the adoption of the precautionary principle, and others. By monitoring breast cancer incidence in women less than 50 years of age in larger series and in other cities, it may also be possible to confirm or disprove the epidemiological changes that are apparently occurring in the distribution of this neoplasm in young Brazil women.

Resumen

El aumento de la incidencia de cáncer de mama en mujeres jóvenes ha sido reportado en varios países. El objetivo fue explorar la distribución del cáncer de mama en mujeres menores de 50 años en Brasil. Se realizó un estudio descriptivo de la incidencia (capitales) y la mortalidad (Brasil y capitales seleccionadas) para el cáncer de mama en el período 2002-2004, los resultados fueron comparados con los observados en otros países. Además, se analizó la evolución de la morbilidad hospitalaria y las tasas de incidencia. Porto Alegre (Rio Grande do Sul) tiene las tasas de incidencia más altas (17,9 y 165,5/100.000, 15-39 y 40-49 años, respectivamente). En cuanto a la mortalidad, Belo Horizonte (Minas Gerais) tiene la mayor tasa de 15-39 años y 40-49 años en Porto Alegre (2,8 y 25,5/100.000). La proporción de hospitalizaciones en el SUS y las tasas de incidencia de cáncer de mama sugieren un proceso de cambio en la distribución epidemiológica. Los resultados muestran un patrón epidemiológico de cáncer de mama en mujeres jóvenes en Brasil con características regionales de distribución.

Neoplasias de la Mama; Incidencia; Mortalidad; Mujeres

Contributors

S. S. Santos and L. R. Melo participated in the project design, data analysis and interpretation, writing of the article, and approval of the final version for publication. R. J. Koifman and S. Koifman collaborated in the project design, data analysis and interpretation, relevant critical revision of the content, and approval of the final version for publication.

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