RESEARCH ARTICLE

Female Breast Cancer Incidence and Mortality in Mexico, 2000-2010

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Abstract

   The objective of this study was to investigate the recent incidence and mortality trends for breast cancer in Mexican females. Data between 2000 and 2010 from the Department of Epidemiology of the Ministry of Health, and International Agency for Research on Cancer (IARC) were analyzed. Age-standardized rates (ASRs) and annual percent changes (APCs) were calculated. The absolute incidence and mortality rates of breast cancer increased: 3,726 and 4,615 in 2000 to 8,545 and 4,966 in 2010, respectively. Incidence increased over time in all age groups tested, the 60-64 age group had the highest ASR (57.4 per 100,000 women in 2010), while the 20-44 age group had the lowest ASR (12.3 in 2010). The results show that incidence of breast cancer has increased in Mexico during last one decade, especially among older women, while the downturn observed in mortality mainly reflects improved survival as a result of earlier diagnosis and better cancer treatment.

Keywords: Breast cancer - incidence - mortality - trends over time - Mexico

Introduction

   Breast cancer is now the most frequently diagnosed cancer and the leading global cause of cancer death in women, accounting for 23% of cancer diagnoses (1.38 million women) and 14% of cancer deaths (458 000 women) each year. Although breast cancer has a markedly higher incidence in developed countries, half of new breast cancer diagnoses and an estimated 60% of breast cancer deaths are now thought to occur in the developing world (Jemal et al., 2011). The incidence and mortality rate in developing countries are even higher because of limited medical infrastructure and awareness (Taghavi et al., 2012; Shaukat et al., 2013).

   Breast cancer can be detected in its early stages through breast self-examination, clinical breast examination and mammography screening. The effectiveness of these strategies has been found to vary according to the resources available and the needs of the population involved (Anderson et al., 2009). In general, however, mammography screening has led to a substantial reduction -estimated to be about 15%- in breast cancer mortality (Ki-Bong et al., 2013).

   Mexico's economic development has led to changes in diet and anthropometrics, particularly among the higher socioeconomic classes with changing patterns of childbearing and breast feeding (lower parity and reduced or no breast feeding) (Gonzáles de Cossío et al., 2013); it has been estimated that Mexican women obtain a high percent of their total energy from fat (Jiménez-Cruz et al., 2012). Both dietary fat and a higher body mass index have been shown to increase the risk of breast cancer in women (Alegre et al., 2013).

In order to better gauge and interpret the changing breast cancer incidence and mortality in Mexico, we studied the trends in incidence and mortality rates from 2000 to 2010, for focus on areas of weaknesses and future avenues to improve breast-cancer care in Mexico.

Materials and Methods

   We obtained the incidence data on breast cancer in females from Incidence Database of the Department of Epidemiology of the Ministry of Health. The mortality data on breast cancer in females was obtained from Mortality Database of the International Agency for Research on Cancer (IARC) of World Health Organization. Registered breast cancer new cancer cases and deaths were extracted on restricting the analysis from 2000 through 2010, in order to examine recent trends over the 11-year period. We excluded cases below 25 years because of paucity of new cancer cases and deaths. The incidence and mortality data

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was grouped in following age groups: women aged 25-44 years, 45-49 years, 50-59 years, 60-64 years, and 65 years and older. The data was exported to Microsoft Excel® for analysis. We computed the number of new cancer cases and deaths, and presented together with age-standardized rates.

Results

Analysis of breast cancer absolute incidence and mortality in Mexico, registered between 2000 and 2010, shows that there were 66405 and 47832 new cases and deaths, respectively. The number of new cases has increased over the years, with the highest peak in 2009 (Table I). Meanwhile, deaths of breast cancer have increased slightly, with a higher peak in 2010 and a minor trough in 2001 (Table I).

There is a general increase in incidence rate throughout the 11 years. Figure 1 shows the breast cancer incidence and mortality rates. The incidence increased by 18.18% annually from 2000 to 2010. In the other hand, mortality rates showed an annual decrease of 1.95%.

Figure 2 shows the trends of age-stratified incidence and mortality rates of women over the 11-year period. The incidence was increased with time in all age groups (Figure 2A). For all age groups, the incidence peaked in the period 2008-2010. The lowest incidence was seen in the 20-44 age group (12.29 per 100,000 women in 2010) and the highest (57.38 per 100,000 women in 2010) in the 60-64 age group.

Furthermore, in the time period analyzed, mortality rate remained at same level in the 25-44 and 45-49 age

Table 1. The Incidence of Breast Cancer and Deaths Cases, 2000-2010

Year	Incidence	Deaths
2000	3726	4615
2001	3971	3572
2002	4728	3832
2003	4655	3870
2004	5191	4158
2005	5272	4216
2006	6162	4449
2007	7460	4514
2008	8072	4837
2009	8623	4803
2010	8545	4966
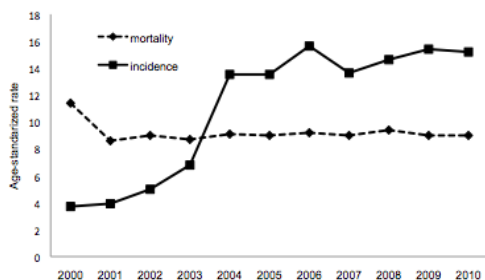
Figure 1. Age-standardized Rates Incidence and Mortality Curves of Breast Cancer, 2000-2010. Age-standardized rates per 100,000
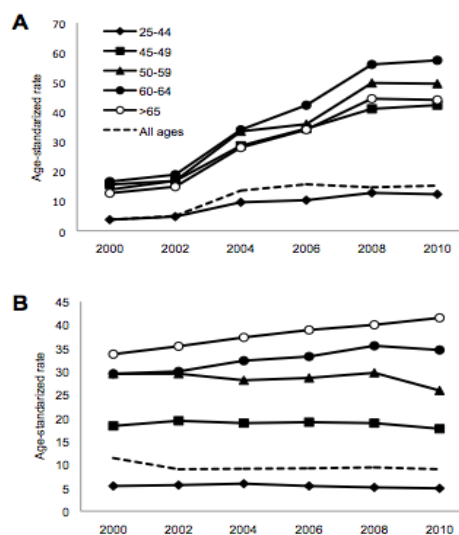
Figure 2. Age-Standardized Rates Incidence (A) and Mortality (B) Curves of Breast Cancer According to Age Group, 2000-2010. Age-standardized rates per 100,000
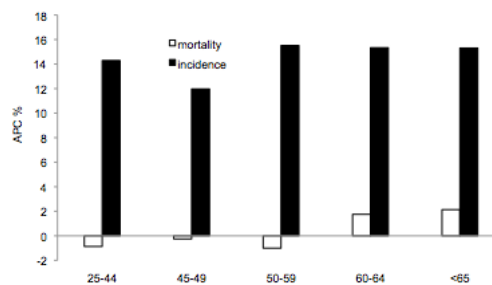
Figure 3. Annual Percent Changes (APCs) in the Incidence and Mortality of Breast Cancer According to Age Group, 2000-2010

groups. However, in the 60-64 and >65 age groups a slight increase in mortality was observed. The 50-59 age group was the only one with a decrease in mortality rate (Figure 2B).

Figure 3 shows annual percentage changes (APCs) to the incidence and mortality rates in each of the age groups (during 2000-2010). Regarding the incidence, the 50-59, 60-64 and >65 age groups had a higher increase of 15% annually, while the 25-44 age group had an increase of about 14%. The 45-49 age group had the smallest increase (11.9%). In the other hand, the mortality APC´s shows that 25-44, 45-49, and 50-59 age groups had a decrease of about 1%, while 60-64 and >65 age groups had a slight increase of about 2%.

Discussion

Our study analyzes the trends in incidence and mortality rates of breast cancer among women in Mexico from 2000 to 2010. The main finding of the study is that the incidence rate increased over the period of 11 years and continues to rise without stabilizing. Similarly, several reports in many countries in Eastern Europe, countries in Africa, Latin America and Asia showing an incidence rate increasing (Pollán et al., 2009; Botha et al., 2003;

Santos et al., 2013; Sipetic-Grujicic et al., 2013; Kyu-Won et al., 2013).

Breast cancer demographic studies from China, Taiwan, India, Japan, South Korea, Sweden, Canada, and the United States revealed a striking difference in peak incidence, which is between 40 and 50 years of age in Asian countries and between 60 and 70 years of age in Western countries (Leong et al., 2010). The age-specific incidence rate in Mexico in 2010 was 42.29 cases per 100,000 for women in 45-49 age group, 49.5 for those in their 50s, and 57.38 for the 60-64 age group, showing an increasing trend in cancer incidence with increasing age.

On the other hand, breast cancer mortality was stable or slightly decrease during period analyzed. Mortality data were similar to other countries with a middle income, e.g. Spain (Cabanes et al., 2009), Colombia (Pedraza et al., 2012), and Brazil (Freitas-Junior et al., 2012). In this study, breast cancer mortality trends remained at same level in all age groups, with exception of the 60-64 and >65 age groups where a slight increase in mortality was observed. In contrast, breast cancer incidence decreased in the 45-49 age group, perhaps because to the development and implementation of policies and programs against breast in Mexico (Martínez-Montañez et al., 2009; Chavarri-Guerra et al., 2012; González-Robledo et al., 2013).

In conclusion, the incidence of breast cancer has increased rapidly in Mexico. Public health interventions could include enhanced breast cancer surveillance in Mexico to monitor trends, testing and dissemination of community-based methods to increase screening among low-income women and women with limited access to health care, development of policies and regulations that reduce barriers to breast cancer screening and treatment, and provision of services, such as patient navigation, that support guideline-concordant treatment of breast cancer. More broadly, interventions are needed that address key mechanisms underlying breast cancer incidence and mortality, such as structural and behavioral programs focused on obesity prevention, and social policies that improve education and increase access to high-quality health care in Mexico.

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