RESEARCH ARTICLE

Burden of Breast Cancer in Iranian Women is Increasing

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Abstract

  <u>Background</u>: Breast cancer (BC) is the leading cause of oncological death for women, in both developed and developing countries. In Iran, breast cancer ranks first among cancers diagnosed in women. The aim of this study was to present the burden of this cancer including incidence, mortality and years life lost (YLL) due to breast cancer in Iranian women. <u>Materials and Methods</u>: National incidence data from the Iranian annual National Cancer Registration reports from 2003 to 2009 and national death statistics reported by the Ministry of Health and Medical Education from 1995 to 2010, stratified by age group, were included in this analysis. Also calculated YLLs provided by the Institute for Health Metrics and Evaluation (IHME) for the years 1990, 1995, 2000, 2005 and 2010 were employed to express the years lost due to BC for Iranian women. <u>Results</u>: The general mortality rate of breast cancer increased during these years from 0.96 to 4.33 per 100,000 and incidence increased from 16.0 to 28.3 per 100,000 for the years under study. YLLs calculated by IHME showed both increasing and decreasing patterns, with a tendency for stabilization. <u>Conclusions</u>: The burden of breast cancer for Iranian women is still increasing. Thus, health education programs to inform women regarding the signs and risk factors, and national screening to facilitate early diagnosis are needed for the female community in Iran.

Keywords: Breast cancer - mortality - incidence - burden - Iran

Introduction

Breast cancer (BC) is the leading cause of oncological death for women, in both developed and developing countries (Jamal et al., 2011). Global incidence trend of breast cancer is increasing especially in countries with a low rate of incidence (Montazeri et al., 2008) and Iran is not an exception (Jafari-Koshki et al., 2014). It has been reported that each year over 502,000 women die from the disease, worldwide (World Health Organization., 2009) and in Iran, BC ranks first among cancers diagnosed in women (Sadjadi et al., 2005; Safaee et al., 2008) with comprising 24.4% of all malignancies (Mousavi et al., 2009). This cancer is also the most frequent cancer in women of Tehran (Mohagheghi et al., 2009). Its mortality rate increased (Taghavi et al., 2012), with similar pattern to expected mortality rates in general Iranian women population (Haghighat et al, 2012). Early detection of breast cancer plays the leading role in reducing mortality and improving the patients' prognosis among women (Elmore et al., 2005; Hoerger et al., 2011). So in some cancers like BC, we expected to see more long-term disease free survival (Rahimzadeh et al., 2014).

Hence, it is necessary and important to get accurate projections of breast cancer burden including; mortality rates, incidence and years of life lost due to this malignancy, this study tried to present the trends of mortality, incidence and YLL (years of life lost) from BC for Iranian women according to latest population data sources, in order to provide update information regarding the burden of this cancer for Iranian women population.

Materials and Methods

The data for this study extracted from three sources; first, National death Statistic Reported by the MOH&ME from 1995 to 2000 (registered death statistics for Iranian population at the Information Technology and Statistic Management Center, MOH and ME) and from 2001 to 2010 (published by MOH and ME) (Naghavi., 2002; Naghavi., 2003; Naghavi., 2004; Islamic Republic of Iran, Ministry of Health and Medical Education, Center for Network management, Information Technology and Applied Researches group Center., 2012) stratified by age group and cause of death (coded according to the International Classification of Diseases [ICD-10] are included in this analysis. Breast cancer [ICD-10: C_{50}] were expressed as the annual mortality rates/100,000,

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overall, by age group (15-49 and ≥50 years of age). Second, national incidence data derived from Iranian annual of National Cancer Registration report from 2003 to 2009 (Islamic Republic of Iran, Ministry of Health and Medical Education, Center for Disease Control & Prevention. Noncommunicable Deputy, Cancer Office, 2009), which provided according to age standardized rate (ASR). Finally, the calculated YLLs which provide by Institute for Health Metrics and Evaluation (IHME) for years 1990, 1995, 2000, 2005 and 2010 (Institute for Health Metrics and Evaluation., 2014) were employed to express the years lost due to BC for Iranian women.

The populations of Iran in 1995-2010 were estimated, using the census from 1996 and 2005 conducted by Statistics Centre of Iran and its estimation according to population growth rate for years before and after national census.

Results

All death records for women due to BC from 1995 to 2010 and the incidence for new cases of BC from 2003 to 2009 are included in this study. The mortality rate of

Table 1. Age specific Rate (per 100,000) and Total Crud Rate (per 100,000) for Breast Cancer Mortality in Iranian Women

| Year	15-49 Years	≥50 Years	Crud Rate
1995	0.74	4.63	0.96
1996	1.08	6.24	1.36
1997	1.14	7.47	1.54
1998	1.2	6.24	1.41
1999	1.49	8.93	1.91
2000	1.65	10.58	2.12
2001	1.82	9.88	2.38
2002	2.14	11.8	2.75
2003	2.1	11.9	2.72
2004	2.08	11.16	2.58
2006	2.25	14.49	3.42
2007	2.57	14.91	3.77
2008	2.4	15.18	3.8
2009	2.3	15.79	3.88
2010	2.73	16.4	4.33

Figure 1. Trend of Breast Cancer Mortality During the Period 1995-2010 per 100,000
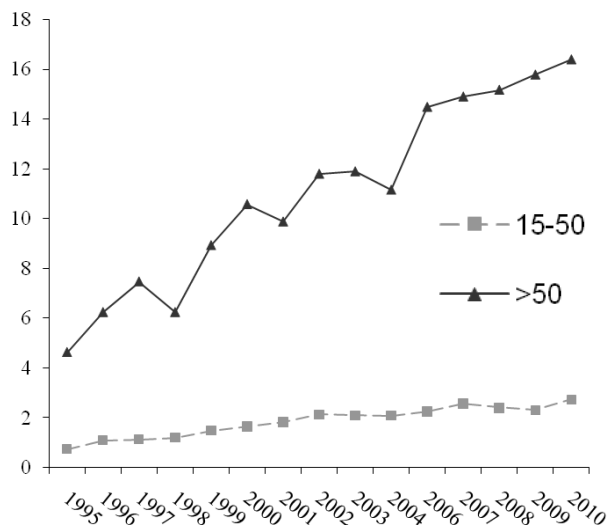
Figure 2. Age Specific Rate (per 100,000) for Breast Cancer Mortality During the Period 1995-2010

Table 2. Crud Rate, ASR and Age specific rate (per 100,000) for Breast Cancer Incidence in Iranian Women

Year	<15 Years	15-49 Years	>50 Years	Crude Rate	ASR
2003	2.79	27.2	41.03	12.19	15.96
2004	1.34	31.1	47.5	13.84	18.24
2005	1.76	38.6	60.82	17.44	23.16
2006	1.6	41.48	66.93	18.9	25.06
2007	2.23	43.85	72.91	20.42	27.15
2008	2.79	53.12	89.35	24.66	33.21
2009	1.62	40.03	84.53	22.09	28.25
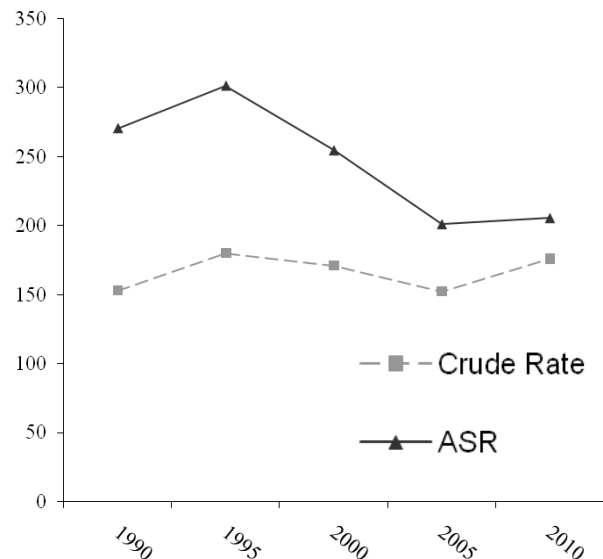
Figure 3. Trend of YLLs Age Specific Rate and Total Rate (per 100,000) for Breast Cancer in Iranian Women According to IHME Estimation

BC increased dramatically during these years from 0.96 to 4.33 per 100,000 (Table1 and Figure1) and its mortality was increasing for age more than 50 years old. For younger age, the rate increased from 0.74 to 2.73 per 100,000 but for older age, it increased sharply from 4.63 to 16.40 per

Table 3. YLLs Age Specific Rate and Total Rate (per 100,000) for Breast Cancer in Iranian Women According to IHME Estimation

Year	<15 Years	15-49 Years	>50 Years	Crude Rate	ASR
1990	186.89	670.21	584.59	152.8	270.35
1995	225.01	703.26	597.69	179.7	301.15
2000	198.47	592.46	416.55	170.9	254.31
2005	154.42	496.12	284.63	152.2	200.77
2010	163.96	529.76	317.92	175.64	205.28

100,000 (Table1 and Figure 2).

The crude rate and ASR of BC incidence were increased during the period under study and the incidence was higher for older age (Table 2). ASR increased from 15.96 in 2003 to 28.25 in 2009 per 100,000. On the other hands, the rate was decreased for age under 15, from 2.79 in 2003 to 1.62 in 2009, but for other age groups, it was increased (Table 2).

YLLs extracted from IHME indicated that the crude rate of years lost due to BC was 152.8 years per 100,000 in 1990 and it changed to 175.64 years per 100,000 in 2010. But the pattern of trends was inverse for ASR which was 270.35 years per 100,000 in 1990 but it was estimated 205.28 years per 100,000 for 2010 (Table 3 and Figure 3).

Discussion

There is an increasing trend for burden of breast cancer in Iranian women, although it is still low compared with developing countries. Since the 1990s, age-adjusted mortality rates for BC have declined in most of developing countries, particularly in the young and middle-aged groups. In the UK and Switzerland, the mortality decreased about 30% (Bulliard et al., 2006), and most Southern, Northern, and Western European countries showed the declining between 15% and 25%, or remind stable for Eastern European countries (Hery et al., 2009; Autier et al., 2011). Another study reported that, in Europe the age adjusted mortality rates declined by 6.9% from 2002 to 2006, with the largest falls in northern European countries (Bosetti et al., 2006). In US, among young women diagnosed with BC, mortality declines have been observed over time, although more rapid gains have been reported to occur in white women (Ademuyiwa et al., 2014). In Asia, Japan, Korea and China an increasing in trends of BC mortality happened (Choi et al., 2006; Katanoda and Yako-Suketomo, 2010; He et al., 2011) which is similar to Iranian patterns.

In European countries, the mortality is decreasing, along with rising incidence rates (Sant et al., 2006), which may be due to more frequent exposure to risk factors of BC including delayed childbearing, lower parity, use of postmenopausal hormone therapy and obesity (Hulka and Moorman., 2008). The declining in mortality rates attributed both to early diagnosis through mammography screening and access to efficient treatments like as adjuvant chemotherapy (Berry et al., 2005). For example an Italian study showed that earlier and steeper decline in

breast cancer mortality could be partially attributable to local organized screening program (Gorini et al., 2014) and another study in Spain in the period 1990-2008 revealed that mortality reduction attributable to screening and adjuvant therapy was about 50% (Vilaprinyo et al., 2012).

Iran is the western part of Asia, with rising incidence of BC. Studies have shown that the age distribution of breast cancer in Iran is nearly one decade lower than their counterparts in developed countries (Mousavi et al., 2006; Mousavi et al., 2007).

Early detection of breast cancer plays the leading role in reducing mortality rates and improving the patients' prognosis among women (Elmore et al., 2005; Hoerger et al., 2011). In Western countries, it is proposed that maximal reductions in burden of breast cancer could be achieved through optimizing treatment use, followed by increasing screening use and obesity prevention (Mandelblatt et al., 2013).

Our study indicating that the trend of BC mortality and incidence in Iranian women were increasing in recent years, however the calculated YLLs by IHME, indicates approximately a level-off pattern. Definitely providing more accurate data needs to data linkage of a cancer Registry data containing survival records and death registry records at the same time interval to prepare more accurate prediction regarding this malignancy (Haghighat et al., 2012).

In Iran, no national screening program for BC conducted yet and studies indicated that the women's awareness of BC warning signs and effective screening were very inadequate (Yavari and Pourhoseingholi., 2007; Montazeri et al., 2008). The World Health Organization guidelines on early detection of BC included two approaches: screening that focuses on detecting cancer in asymptomatic women and clinical down-staging (or early diagnosis) that focuses on detecting cancer in early stage (Corbex et al., 2012; World Health Organization., 2013). It seems that, to middle and lower-income countries, clinical down-staging is a cheap and easy-to-implement alternative to screening, can result in women being diagnosed with earlier and curable disease rather than later with mainly incurable BC (Burton and Bell, 2013). Besides, for Iranian women, health education program would be beneficial to reduce the lack of women's awareness regarding BC, to control the burden in future.

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