Epidemiology of Breast Cancer: Current Figures and Trends

26

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26.1 Introduction

Noncommunicable diseases are fast- and ever-growing health problems, probably due to the westernized lifestyle, increased life expectancy, and increased lifetime exposure to the known risk factors for that particular disease [1]. As a consequence, the incidence of majority types of cancers has increased, may be due to increased access to better screening strategies. According to GLOBOCAN 2012, 14.1 million new cases of cancer were detected with 8.2 million cancer deaths worldwide. Lung cancer accounted for the most number of cases as well as deaths from the same [2]. Breast cancer is a major public health problem for women throughout the world. Breast cancer is the second most common cancer overall and by far the most common cancer in women with slightly more cases estimated to have occurred in developing regions than in developed regions.
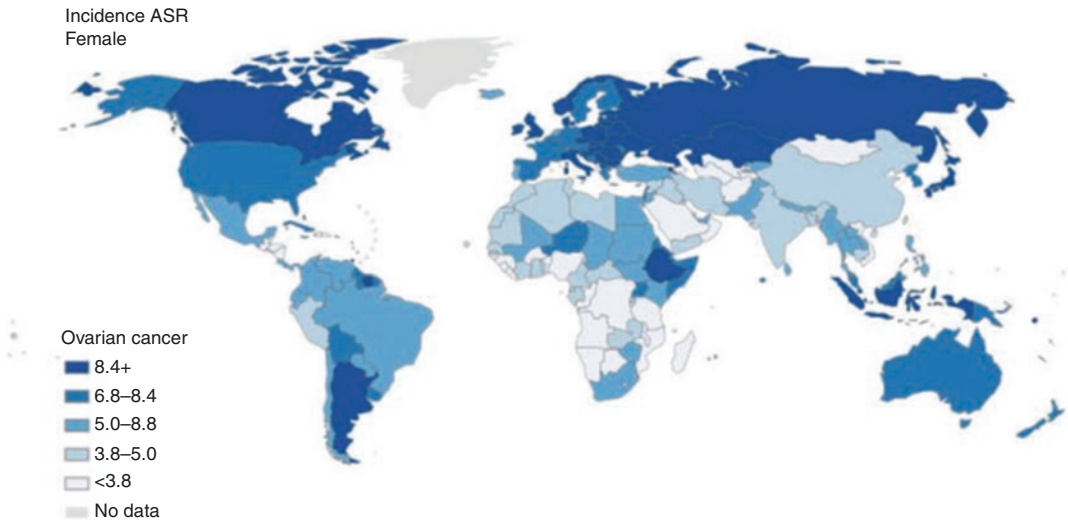
26.2 Epidemiology

On an average, women over 60 years of age are more likely to be diagnosed with breast cancer. Only about 10% to 15% of breast cancers occur in women younger than 45 years. However, this may vary for different races or ethnicities. The incidence of breast cancer increases with age, doubling about every 10 years until the menopause, when the rate of increase slows dramatically.

Breast cancer is the most common cancer with 1.7 million cases but ranks fifth as the cause of mortality (522,000, 6.4%). In 2012, 14.1 million new cases were detected which is expected to rise to 22 million new cases by the next two decades [3].

Breast cancer accounted for almost 11.1% of all cancers in more developed nations compared to 13% in less developed nations. It is the most frequent cause of cancer deaths in females in less developed regions (14.3% of total) and second most common cause of cancer death in developed regions after lung cancer (15.4%).

There is a wide variation in incidence rates of breast cancer ranging from 19.4 per lakh in Eastern Africa to 89.7 per lakh in Western Europe [4].

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Incidence ASR
Female

Ovarian cancer
■ 8.4+
■ 6.8–8.4
■ 5.0–8.8
■ 3.8–5.0
□ <3.8
■ No data

Source: GLOBOCAN 2012 (IARC)

Fig. 26.1 Standardized incidence rate of breast cancer in world in 2012. Adapted with permission from Ferlay J., Soerjomataram I., Ervik M., Dikshit R., Eser S., Mathers C., Rebelo M., Parkin D.M., Forman D., Bray, F. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC Cancer Base No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://gco.iarc.fr/today/home. Source: GLOBOCAN 2012 (IARC)

26.2.1 Incidence Rates (Fig. 26.1)

It was estimated that 1,671,149 new cases of breast cancer occurred in the world in 2012, of which 882.9 (per 100,000) were from less developed countries, while 793.7 (per 100,000) of them occurred in the developed nations. GLOBOCAN 2012 estimated it to be the most common cancer in women with the standardized incidence rate of 43.1 per lakh [2].

Among the six regions of WHO, the highest incidence was observed in PAHO (Pan American Health Organization) and the lowest incidence was noted from SEARO, 66.6 and 27.8, respectively (Southeast Asia Region). Belgium had the highest incidence rate of 111.9, whereas Mongolia and Lesotho had the lowest rate of 9. Belgium, Denmark, Bahamas, and the Netherlands had the highest standardized incidence rates. Northern America and Western Europe had the maximum incidence rates of 91.6 and 91.9, respectively, and middle Africa and Eastern Europe had the lowest incidence rates of 26.8 and 27.0, respectively. In India, the estimated incidence is 1,45,000 cases per year, and the estimated mortality rate is 70,000 deaths per year [5].

26.2.2 Mortality Rates (Fig. 26.2)

521,907 deaths were reported due to breast cancer in 2012. The age-specific standardized mortality rate (ASMR) was 12.9 per lakh after lung cancer in the world. The Eastern Mediterranean Region (EMRO) had the highest standardized mortality rate of 18.6, and the Western Pacific Regional Office of WHO (WPRO) which includes 37 countries had the lowest rate of 7. Africa had the highest mortality rate of 17, whereas Eastern Asia had the lowest mortality rate of 6.9. Fiji (28.4), the Bahamas (26.3), Nigeria (25.9), FYR Macedonia (25.6), and Pakistan (25.2) had the highest standardized mortality rates per lakh [5].
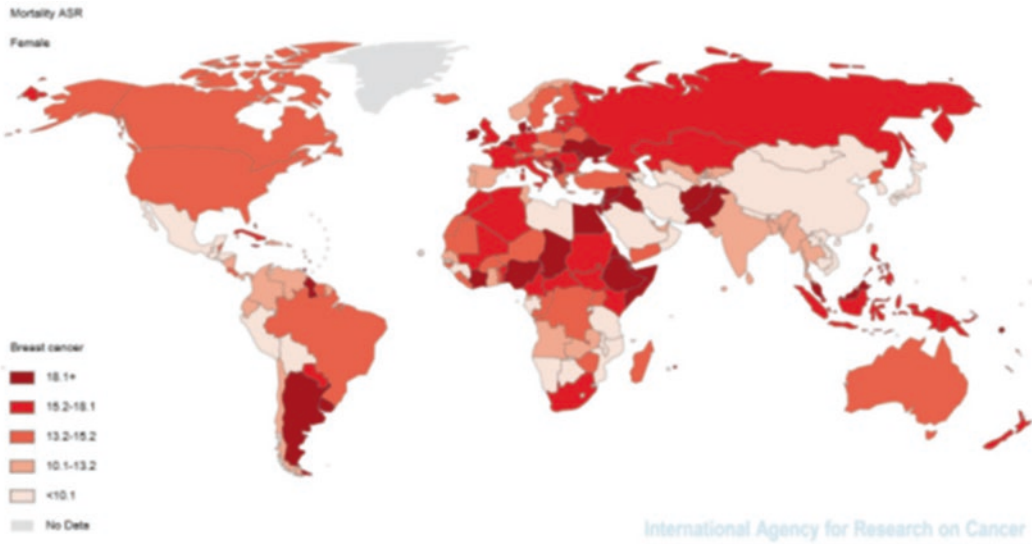
Fig. 26.2 Standardized breast cancer mortality rates in world in 2012. Adapted with permission from Ferlay J., Soerjomataram I., Ervik M., Dikshit R., Eser S., Mathers C., Rebelo M., Parkin D.M., Forman D., Bray, F. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC Cancer Base No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://gco.iarc.fr/today/home

26.2.3 Human Development Index (HDI)

Very high HDI countries had the highest age-specific incidence rates (ASR) of 78 but the lowest mortality rate of 14.1, while low HDI countries had the lowest ASR of 32.6 but the higher mortality rate of 17. The lowest incidence and mortality was seen in countries with medium HDI [6]. In a study by Ghoncheh, increased HDI was associated with increased incidence of cancer though it did not significantly relate to death [7].

The reasons for these fluctuating trends in incidence and mortality rates observed across the globe are partially due to the difference in the risk factors across different geographical boundaries and also due to the differing trends in breast cancer diagnosis.

Factors like obesity and sedentary lifestyle are the primary reasons for higher incidence noted in the developed nations and for ever-increasing rates in Asian and Asian American women [8]. Delayed childbearing has been particularly associated with large increases observed among Hispanic and Hispanic American females [9].

Michelle et al. in their analysis found that western countries had the highest rates ranging from 49.7 per lakh in Puerto Rico to approximately 97 per lakh in countries like America and Australia. These were 3–4 times the rates found in Asia (27.2–36.2). They concluded that though breast cancer incidence rates increased in the 18 countries they studied, still no clear geographic location or ethnicity emerged. The incidence and mortality varied to up to fourfold globally between 1993 and 1997. North America had the maximum incidence followed by Western Europe, Oceania, Scandinavia, and Israel. Eastern Europe, Southern and Latin America, and Asia had the lowest rates [10].

In the date shown by GLOBOCAN 2012, North America and Western Europe still top the list, though the incidence rates have shown a mar-

ginal decrease for middle Africa and Eastern Asia from the previous analysis done by Michelle et al. (26.8 and 27.0, respectively) [2].

Japan has registered a 6% increase per year from 1999 to 2008. In South Korea the rates have shown an increase [11], whereas Hong Kong has registered a decline of the same [12]. Highest death rates due to breast cancer have been seen from Malaysia and Thailand [13].

Though race and hereditary are strong predictors for the risk of breast cancer, studies on migrant women from low- to high-income areas reveal that social and environmental issues too play a major role.

Younger age at menarche, late menopause, delayed first birth, and postmenopausal obesity all increase the lifetime exposure to estrogen and are possible explanations for the varying rates observed in American women versus Asian (97/lakh vs 27/lakh) [14, 15]. Shimizu et al. demonstrated that women from low-income countries had lower estrogen levels, in turn a lower risk. An Indian study showed that rural lifestyle decreased the risk of breast cancer [15].

Early detection improves the outcome of treatment and thus 5-year survival which is >80% in North America and <40% in low-resource countries [4]. Socioeconomic status directly correlates with the disease stage and survival [16]. Education goes a long way to help women in choosing the screening at the earliest. Yip et al. showed that cancer mortality was way higher in low-income countries especially Africa where treatment is sought late in the course of the disease [17]. Similar is the case with Kenya and Uganda [18].

Breast cancer care has to be a multimodal approach with the availability of both screening and treatment options, all available to the women in need.

Maybe different strategies have to be planned for both developed and developing nations. Breast self-examination (BSE) first followed by a mammography if required would be a better option in resource-constrained areas. BSE does not decrease death rates but increases awareness as mammography is not cost-effective here [14, 19].

Screening mammography is a better option for developed countries. In western countries, breast cancer incidence rose by ~30% when screening programs were implemented in the late 1980s, whereas in the Asian world, it was not the case as most breast tumors are detected by BSE with the exception of Japan where population screening was started in 1987 [20].

Increase was noted from Latin America and the Caribbean probably due to the increased use of mammography as well as the delayed first birth, but what contributed more is still largely unknown [9, 21].

Finally to contain this issue and the associated morbidity and mortality, a robust and an accessible health system has to be in place so that effective population-based strategies can be planned and implemented to ensure better coverage. Underreporting and failure of diagnosis could be the cause of bias in cancer registration, especially in less developed countries, so population-based cancer registries (PBCR) should be put into place. Among Denmark, the Netherlands, the Bahamas, and Belgium, which have high incidence, all except Bahamas have a PBCR. Countries like Fiji, Nigeria, the Bahamas, and Pakistan, which have the highest death rates from breast cancer, have no PBCR [5].

26.3   Conclusion

GLOBOCAN estimates provide an impetus for regional and national prioritization of cancer control of the predicted 22 million new cases by 2025. The greatest increases are anticipated in low-income countries, so long-term planning is the need of the hour to decrease the future cancer burden by utilizing the available resources appropriately. Though there is a global increase in breast cancer incidence, still the mortality from the same has either plateaued or decreased. The reasons are multiple, from early detection to mass implementation of screening programs to improved and advanced treatment, but still the divide between the rich and the poor is intangible.

Key Points

- Worldwide, breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death among females.
- It is still the most common cause of cancer death in women in developing regions, but the second most common cause of cancer death (after lung cancer) in women in developed regions.
- The incidence of breast cancer increases with age, doubling about every 10 years until the menopause.
- Very high HDI countries had the highest age-specific incidence rates (ASR).
- The fluctuating trends in incidence and mortality rates observed across the globe are partially due to the difference in the risk factors across different geographical boundaries and also due to the differing trends in breast cancer diagnosis.

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