RESEARCH ARTICLE

BURDEN OF BREAST CANCER: DEVELOPING COUNTRIES PERSPECTIVE

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Manuscript Info

Abstract

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Breast cancer (BC) is the most common cancer to be diagnosed in more than 100 nations and is the main reason why most women die from cancer. This article mainly reviewed the breast cancer in the worldwide and emphasizes on the burden of BC in developing countries. Different developing nations like Nigeria, Jordan, Fiji Islands, Bangladesh, Afghanistan, India, Pakistan, South Africa, Brazil, China etc. have shown higher death rates and their women are struggling highly with BC due to many factors: economically instability, poor infrastructure and unawareness. The incidence and mortality rates of respective regions and countries are described with comparison between developed and developing countries. In conclusion, there are various ways to detect and diagnose BC and reasons to show their dominance in certain regions of the world.

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Introduction:-

Breast is an organ of human, located on the top of ribcageand creates chest. Different glands, ducts and fatty tissues master up to create it. The cells of any region in breast some time divided uncontrollably in unmannered way and leads to Breast Cancer (BC). It can commence in one or both of the breasts and both male or female have chances to express it. Breast Cancer is a global dilemma, which has besieged the entire world. It is frequently occurring disease in women like, lungs cancer in men. Breast lumps can be benign or malignant depending on the stage, which can be life threatening. Breast cancer can be invasive and non-invasive(1). In invasive carcinomas, cells moved out of the ducts to the lymph nodes, for instance, Invasive Ductal Carcinoma which further divided into subtypes: Medullary (<5%), Mucinous (<2%), Tubular (<2%), Papillary (<1%), Metaplastic(<1%), Cribriform(<1%). Lobular Carcinomas are another type of invasive one which is reported 10% of all breast cancer. While, non-invasive carcinoma refers to those which do not move out of ducts(2). It has been described that in 2022, approximately, 287,850 cases of invasive type were reported and most of them were ductal carcinomas in U.S. and it was revealed that ~1 in 8 (13%) women have chance to get Invasive BC and about 3% women die due to BC. More than 4.1 million women live with BC history in the U.S(3).However, its burden varies from place to place depending upon

the economic developments and facilities of one country (4). BC can be aggressive to those who have early-onset breast cancer and non-aggressive in those who have late onset breast cancer. Early-onset breast cancer is that disease which is diagnosed under the age of 60s while onset-breast cancer occurs above the age of 60s. It has become a burden on all over the world, especially on developing nations due to improper factors. It has been investigated by World Health Organization the cases and death rate due to BC was lower during2004 and is increasing by years. Its occurrence has increased by 2022, which obvious the burden of BC on nations(5).

Factors Increasing Burden Of Bc In Developing Nations
It is a multistep disease that is ascribe by sporadic and familial reasons. Developing nations are deficient with the resources and healthcare infrastructures.One study demonstrated that Nigeria, Fiji Islands and French Polynesia, that are developing countries, have lower incidence of BC but higher mortality rate. In the absence of mammography, Breast-self-examination and clinical breast examination are basic treatments to control BC, but the women of respective countries are unaware of the basic treatment. It was observed that only 75.6% have never gone through breast-self-examination in Nigeria and 58.2% are unaware of this examination(6)(7). Another study done in Afghanistan in 2022, which showed higher rate of BC cases and deaths(8). Furthermore, study revealed that 41% women are not acknowledged with Breast cancer, 71% are unaware of screening and 96% do not know what breast self-examination is in Bangladesh. In the areas, where mammography is available, less percentage of women have accessed to mammography. Merely, 11.4% in Jamaica, 22% women received regular mammography in Mexico while 7% are exposed to mammography in Jordan(9). In general, considerable factors behind the highest mortality rate in developing countries are: nescience, non-serious attitude towards, health, make decision lately, inadequate self-care, higher costs of treatments, female hesitation about privacy, lacking therapies; like radiotherapy, which is non-affordable in many nations. Afghanistan is on 51 position, which do not receive radiotherapy treatments(8). Despite of, Improper screening and diagnoses centers and equipment, economically instability, poverty, lifestyle, hormonal changes, diet, environmental issues, ethnicity, racism, improper exposure of workers to radiations, smoking, alcoholism and genetics(10)(11)(12)(13).

Although, some improvements in BC cases have seen in some regions due to Due to the advancement in the therapies for BC like, mammography, detecting in early stages, surgeries, therapies like chemotherapy, hormonal therapies, HER2-directed agent trastuzumab, gene therapy but still under progress due to high expenses in different developing countries(14).

Burden Of Breast Cancer In The World
The increasing burden of BC incidence rates can be also attributed to epidemiological and demographic transitions and the extensive use of mammography screening(15). Aging is one of the another factor which add up the burden of BC(16). Furthermore, genes like BRCA 1, BRCA2, ATM, APC, PTEN, TP53 and FHIT mutations are deadly involved in causing BC(17)(18). A study revealed that BC in the worldwide has suppressed the incidence rate of lungs cancer, accounting for more than 2.3 million new cases and 11.7 per cent of all the cancers, while is on 5th position for the mortality rate. In most of the countries it is ranking atop for incidence and mortality rate. BC have resulted in top incidence and mortality rate in 159 and 110 out of 185 countries, respectively(19). Comparing with transitioned nations, its incidence rates were almost twice as high (ASR 55.9 versus 29.7 per 100,000, respectively(20). However, death rates for women in developing nations were 17% higher (15.0 and 12.8 per 100,000, respectively). It was revealed that women residing in transition nations had 17% higher mortality rate. When it comes to absolute cases and deaths, transitional nations accounted for approximately 20% of all cases and 30% of all deaths from breast cancer in the worldwide(20).

According to a research, older age, ≥ 50, were the major factor of causing deaths particularly, in developing countries(21)(22)(23).The mortality rate that is linked to the age factor for breast cancer cases is 13 % worldwide, but Africa showed the higher rate (Age Standardized Mortality Rate) ASMR(24). Age-standardized incidence rates varied almost three times amongst the different nations, ranging from 113.2 per 100,000 people in Belgium to 35.8 per 100,000 people in Iran. The incidence rates in developing nations (Iran, China, Mexico, Cameroon, and Costa Rica) were lower than the global age-standardized incidence rates in all the regions evaluated, the age-specific incidence rates of breast cancer were relatively low for females under the age of 25, but exploded after this point. Surprisingly, the peak age for breast cancer varied between different parts of the world. 40 years old was the beginning peak age for South Korea and Cameroon. Peak nations included China, Japan, Iran, Fiji, and Morocco, with females aged 55 to 60. In the United States, Belgium, Australia, and the United Kingdom, the breast cancer maximum onset age was 70 years old(25).

As compared to six deaths per 1 million people in Asia, there are usually 20 cases of mortality per 1 million people in Africa. In Asia, the mortality/incidence rate ratio ranges from 0.25 to 0.5, whereas it is 0.17 in North America, indicating a higher survival rate. Due to their typically poor to moderate economic status, Asian nations have one of the higher rates of invasive cancer(26).China had the highest BC related cases and deaths among the various nations, making up about 18.4% and 17.1% of all cancers, respectively(25)(27)(28). The US came in second with 11.8% of all BC cases and 6.2% deaths. Approximately more than 685,000 women worldwide lost their lives to breast cancer, which accounted for 15.5% of all cancer-related deaths and according to a study continued till 2022, It is evaluated that 2,261,419 new cases of BC in women existed worldwide(29).

Breast Cancer In Developing Countries
Incidence of BC in developing Countries
Breast cancer is the most common cancer to be diagnosed in more than 100 nations and is the main reason why women die from cancer(30).On the African continent, South Africa has the highest incidence of breast cancer. Urbanization and lifestyle changes are to account for such rising incidence rate(31). Countries with minimal resources have high rates of breast cancer mortality. In Africa, it is the second most common factor in cancer-related deaths for females(32). Breast cancer incidence rates have increased by a factor of two in Algeria and Uganda in recent years(33)(34).

According to the annual survival rate, the cases of breast cancer increased by 96% in the UK and 98% in Italy(35). The occurrence rate of BC is different in the different regions worldwide which are as follows; 96/100 in Europe, 92/100 in America, 87/100 in New Zealand, and 29/100 in Asia. Due to the fewer advancements in treatments and detection, the Women of Africa have less survival rate from breast cancer(36).World Bank demonstrated the total population by 2020; approximately, 206,139,581 people live in Nigeria. Among them incidence of Breast cancer is higher, evaluated by Nigerian National System of Cancer Registries data, which showed highest incidence of BC. Total cases contained 9149 and 2798 cases out of them were of 15-39 age(37). Similarly, highest rate of BC cases occurs in Jordan, which is a developing country. It accounts for 20.8 % cases followed by colorectal cancer(38).

Mortality of BC in developing countries
In contrast to developed countries like Western Europe and North America, which have high incidence and low mortality rates, economically developing nations like those in Africa, Asia, and Central America have low incidence rates and high mortality rates(30)(39). Despite low incidence rates, the majority of deaths from breast cancer are thought to occur in poor nations like Brazil(40)(41). The most common cancer in women and the main reason for cancer-related fatalities in Brazil is breast cancer(42).

Asia is thought to be home to 39% of all breast cancer diagnoses worldwide; 25% of these deaths are reported in China. Due to the wide variances in socioeconomic disparities among Asian nations and regions, there are differences in the incidence and mortality rates of breast cancer(26). In a recent population analysis by Mubarik et al.(43). Pakistan was found to have the highest incidence of breast cancer; China and India were closely behind it in terms of incidence. Similar to other research, Mubarik et al. found significant regional variations in the incidence of breast cancer in Asia; these variations may be up to 10-fold(43). Depending on how economically developed or urbanized a region may be, the age-standardized rate (ASR) of breast cancer in China ranges from 7.9 per 100 000 to 46.6 per 100 000. Results of a population survey found that for women between the ages of 20 and 49 in China and India, the incidence rate increased with age. Even yet, the incidence risk was lower for females between the ages of 60 and 79. A study done in Afghanistan, where data was collected from Jamoriat Hospital of oncology, which showed highest rate of mortality rate occurred due to BC in the entire population of Afghanistan(8). Through GLOBOCAN, which reported total 13,028 cases of BC in Bangladesh and among these cases, 6,780 deaths. It was observed hereby, that in female BC mortality rate is higher which accounts 6.2% and is listed on the top cancer among women of Bangladesh but achieved 3rd position among the entire cancer cases.

Breast cancer prevalence across the nation in 2019 as expressed in all-age absolute counts and age-standardized rates. With 368 375[290 086-463 336] incident instances, China led Asia in terms of occurrence, followed by India (144 086[110 434-181 150]), and Japan (74 260[59 292–90 978]). China and India were the top two nations in terms of death tolls in 2019, with 93 499[74 511-115 420] and 82 099[63 114-104 727] deaths, respectively(44). Even though it had fewer instances (50 293[36 575-68 299]) than Japan, Pakistan was rated third in terms of mortality toll, ahead of that country (74 260[59 292–90 978]). Due to high rates of breast cancer, China, India, and Pakistan once

again topped the list in terms of all-age DALYs with 2.9 million [2.3–3.5 million], 2.7 million [2.0–3.4 million], and 1.1 million [818 710–1.5 million] DALYs in 2019(25)(44).
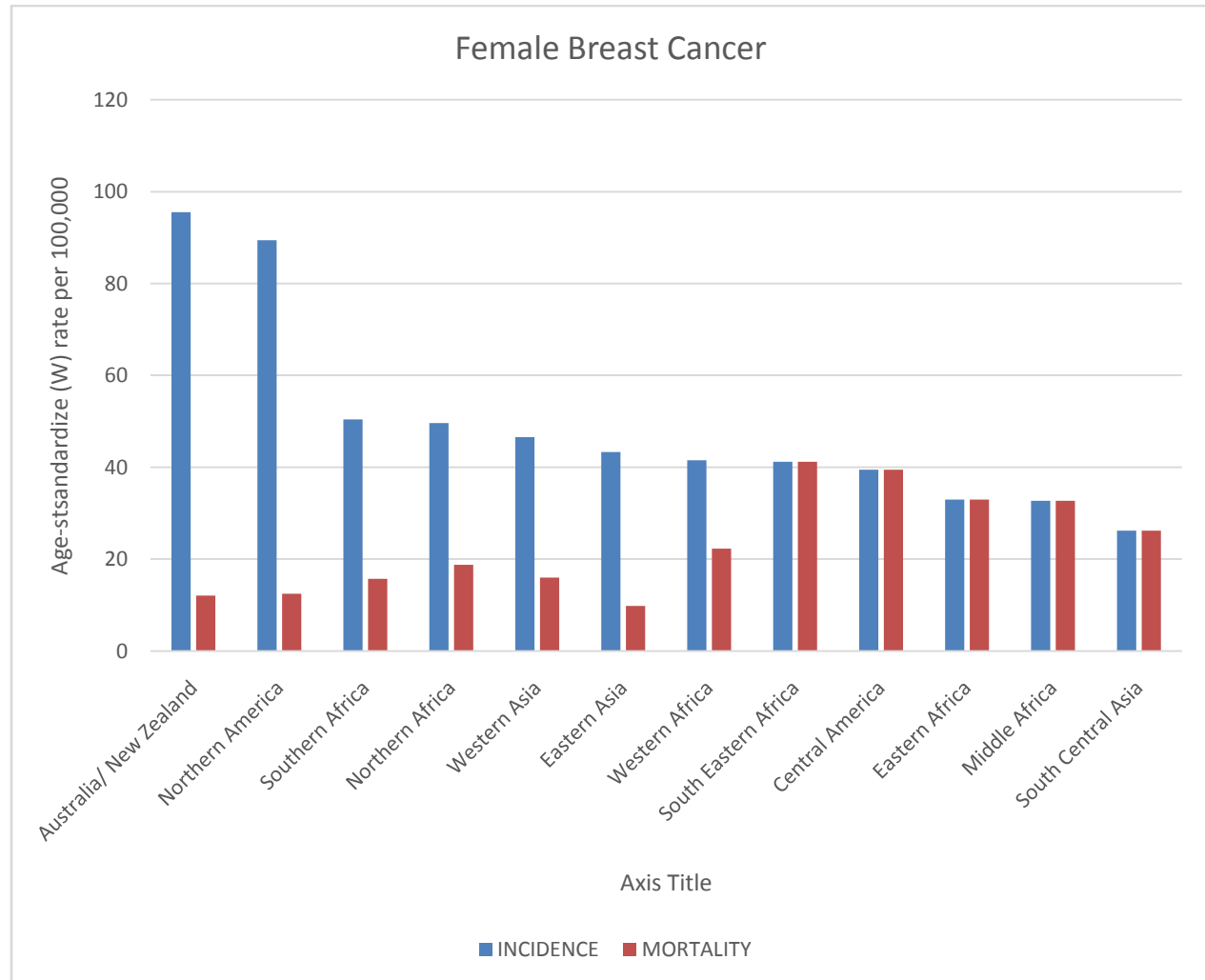
Figure 1:- Region-Specific Incidence and Mortality Age-Standardize Rates for Female BC in 2020(23).

Conclusion:-

Breast cancer is an issue that has spread its devastating effects on the globe. None of the country is safer from this destructive disease. Breasts are the part of human, but it has specific role in women due to mammary glands present in them. Women are mostly victimized from this disease than men. Its prevalence and mortality differs from location to location due to many hazardous factors. It has been concluded from the various studies that developed countries suffers highly but their mortality rate is lesser due to massive facilities, education and developed economical statuses than the developing countries. The highest rate of incidence occurs in U.S. but the mortality rate is lower over there, because they are facilitated with best healthcare systems. Developing countries faces many difficulties which has escalated the frequency of BC in population; rangingfrom education to checkups, centers and government guidelines issues. In conclusion, the chances of BC can be reduced if the early detection, awareness, medical systems, adequate centers for the diagnoses, government role in making good policies for the health and fruitful guidelines for the treatments of BCare granted. This will play synergistic roles in decreasing the mortality rate of BC in developing countries. Notably, barriers and obstacles that reduces the early diagnosis of BC in patients need to be identified which can improve the health care system of every country for cancer.

Conflict Of Interest
The authours declared no conflict of interests.

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