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# Review of Breast Cancer in Nigeria: Prevalence, Management, Survival Outcomes and Quality of Life

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## INTRODUCTION

Breast cancer is a highly dreaded disease, predominantly in the female population. Despite not having a complete understanding of the aetiology of the disease, majority of women are familiar with the disease [1] and express heightened fear of it [2]. Breast cancer remains a global problem, steadily ranking the highest among female cancers for decades [3]. Therefore, it is indeed worrisome that even though several decades of research have been dedicated to it, its prevalence remains high, with a steady increase in mortality rate [4]. This paper provides a comprehensive review of the state of breast cancer in Nigeria compared to the global picture. We will explore the prevalence of breast cancer in Nigeria and the management strategies used to treat the disease. Additionally, we will examine the survival outcomes and quality of life of breast cancer patients in Nigeria, highlighting the challenges they face and the resources available to help them in their fight against this disease.

## INCIDENCE AND PREVALENCE

The Global Cancer Observatory reported 2,261,419 new cases of breast cancer, making it the highest of all cancer cases (11.7% of all cancers combined and 24.5% of cancers in women). Globally, Asia accounted for the highest incidence of breast cancer (1,026,171) and the highest breast cancer-related mortalities (346,009) [5]. It is worthy of note that although Africa accounted for the fifth highest number of recorded cases in the world (8.3%), it accounted for the third highest number of mortalities (12.5%) [5]. This is suggestive of poorer health outcomes on the African content. China recorded the highest number of cases per country with an incidence of 416,371 and a rate of 90.3 per 100,000. The country with the highest breast cancer rate, however, was Belgium, with an incidence of 11,734 but a rate of 113.2 per 100,000 [5, 6].

Of the 49,339 and 186,598 recorded cases of breast cancer in West Africa and Africa in 2020, Nigeria alone accounted for 57.5% and 15.2% respectively, with a 5-year prevalence of 60,296 coming up to 59.31 cases per 100,000 people [5, 7]. This is comparable to the proportion of the Nigerian population which makes up 50.7% and 15.3% of West Africa and Africa [8, 9, 10]. Breast cancer accounted for 12.1% of all cancers in Nigeria, closely followed by lung cancer in second place [5].

Countries in Latin America and the Caribbean had the highest breast cancer mortality rates. The country with the highest rate was Barbados at 42.2 per 100,000 people, followed by Fiji (41.0 per 100,000), Jamaica (34.1 per 100,000) and Bahamas (31.0 per 100,000) [5]. However, Asia as a continent had the highest number of mortalities, accounting for 50.5% (346,009) of all deaths (684,996) in the world. This is followed by Europe (141,765) and then Africa (85,787). West Africa recorded a total number of 25,626 deaths, and Africa in total. With 14,274, Nigeria accounted for 55.7% and 16.6% of breast cancer-related deaths in West Africa and Africa respectively [5].

## MANAGEMENT

Breast cancer management options are typically multidisciplinary, and the extent of the lesion at the time of presentation determines the choice(s) of management in each case. Early presentation typically requires more conservative management options and has a better prognosis. Clinically speaking, the management of a patient begins with taking a good history, carrying out a thorough physical examination, relevant investigations to make a definitive diagnosis

and determine the histological type of breast cancer, and assessing the extent of the disease. Based on the above, a diagnosis is made which informs the choice of treatment. Although not synonymous, breast cancer is commonly used to describe breast carcinoma. The common morphological types of breast cancer include infiltrating ductal carcinoma, infiltrating lobular carcinoma, and mixed ductal/lobular carcinoma accounting for 70-80%, 8%, and 7% of invasive breast cancers respectively [11].

Mammography is the mainstay of breast cancer screening and diagnosis with a sensitivity of about 70% [12]. Morphological findings in mammography that are suggestive of a lesion include masses, calcifications, asymmetry, and any forms of architectural distortion. Women with dense breast tissue are usually at a higher risk of occult lesions during mammography [12]. The National Comprehensive Cancer Network (NCCN) recommends annual mammography screening to be initiated at the age of 40 until comorbidities limit life expectancy to less than 10 years [13]. Mammography uptake is quite low in Nigeria, and this contributes to a high rate of delayed presentation. A study in Southwest Nigeria revealed that only 2.8% of women in a community with access to mammography services had ever undergone one, the majority not being within the previous year. The rate was expectedly lower in a community with no mammography services, at 1.8%. Of all respondents, 11.4% and 11.6% were familiar with mammography in the community with access to mammography services and the community without access to mammography services respectively [14]. A study among female health workers also in Southwest Nigeria showed that only 15.4% had ever utilized mammography, the majority of them long after they had attained the recommended age of annual screening. Of all the health workers, 78% had never referred eligible candidates for mammography and only 24.8% had access to mammography at their places of work [15]. In Northern Nigeria, a 7.9% uptake rate of mammography was recorded among female health workers, with the most popular reasons for not seeking mammography being that "nothing is wrong with them" and "they are healthy" [16].

Treatment options for breast cancer can be medical through the use of chemotherapy drugs, surgical, radiotherapeutic, endocrine or a combination of any [17]. Combination chemotherapy is generally preferred over monotherapy as it is more efficacious, reduces the risk of recurrence, and allows for dose reduction [18]. Breast cancer chemotherapy traditionally includes an alkylating agent (e.g. cyclophosphamide) and an antimetabolite (e.g. methotrexate and 5-fluorouracil) [18]. Neoadjuvant chemotherapy involves the use of anticancer drugs before surgery, to shrink the tumour. An example of neoadjuvant chemotherapy is a combination of docetaxel and epirubicin, which was reported to have a response rate of 76.7% [18]. A few side effects of breast cancer chemotherapy have been identified. These include cancer-related fatigue, insomnia, peripheral neuropathy (usually caused by platinum agents and taxanes), cognitive impairment ("chemofog" or "chemobrain"), infertility, cardiotoxicity, and an association with second cancers typically Acute Myeloid Leukemias (AML) [19].

Surgical therapy for breast cancer can either be breast-conserving or radical, in the case of mastectomy. Breast-conserving surgeries mostly involve the removal of the lump only, followed by adjuvant whole-breast irradiation. This is done in early-stage cancers with clear margins. Studies have shown up to 20-year survival outcomes of breast-conserving surgeries, equivalent to those who had mastectomies, in patients with stage I and II breast cancer. The rate of recurrence is usually dependent on the cancer subtype, irrespective of surgery modality in early-stage cancers. Mastectomy is done in more advanced cases, and can either be total, skin-sparing, or nipple areolar-sparing. Radiation may also be required after mastectomy in patients with advanced disease [17].

Patients with hormone receptor-positive cancer cells benefit from endocrine therapy. Yearly breast cancer mortality was seen to have reduced by up to 30% in patients placed on adjuvant tamoxifen, a selective estrogen-receptor modulator [17]. Detailed clinical data on the use and effectiveness of tamoxifen in Nigeria is not readily available. While the exact indices of its usefulness in the Nigerian population are not known, a higher possibility of relapse in the course of endocrine therapy is suspected, due to acquired resistance in the case of long-term therapy in late presentations [20]. The genomic biodiversity of the Nigerian population also poses an interesting perspective, due to the complex interactions of activators, repressors, and transcriptional factors in the expression of oestrogen receptors [20].

## SURVIVAL OUTCOMES

In Nigeria, chemotherapy alone is the most prevalent treatment modality in breast cancer patients [21]. The one-year, two-year, and five-year survival rates

of breast cancer patients in Nigeria are reported to be 80%, 43% and 32% respectively [21]. This shows a sharp decline in the number of patients who survive beyond the first year. In contrast, the five-year survival rate of breast cancer patients in the United States is reportedly 99% for localized lesions, and 86% for regional, as reported by the American Cancer Society. The overall five-year survival rate of all stages is 91% [22].

Overall, survival estimates in Nigeria are significantly higher in patients receiving multimodal therapy [21]. The five-year survival of patients receiving surgery, chemotherapy, and radiotherapy was found to be 30% higher than those receiving surgery and chemotherapy alone [23]. Patients with early-stage (I and II) disease were also noted to have better survival rates by 32% in comparison to those with late-stage disease (III and IV) [21]. This further emphasizes the need for routine screening of patients for early diagnosis and initiation of treatment.

## HEALTH-RELATED QUALITY OF LIFE

The overarching goal of the management of any medical condition is to improve the quality of life of the patient. Breast cancer patients with poor body image have been seen to have higher levels of psychological distress than their counterparts. Factors like higher level of education, being married and old age have been associated with better quality of life [24, 25], although in some cases, younger patients are reported to have better scores [24, 26]. Post-menopausal patients in South Korea were seen to have lower levels of physical functioning than others [26].

A study in Southeastern Nigeria found that the overall well-being of patients receiving care was significantly poorer than those in higher-income countries. Post-menopausal patients and those who had undergone mastectomy had significantly lower emotional well-being than other participants. In addition, all the participants in the study were noted to have advanced disease of at least stage IIIA, which is suggestive of overall poor physical health [25]. More studies on the quality of life of patients living in Nigeria are not well documented. The low survival rate of people with the disease could be a contributory factor to not being able to adequately assess quality of life post-diagnosis.

## CONCLUSION

The WHO Global Breast Cancer Initiative (GBCI) has a target to reduce mortality by 2.5% per year, which is preventing 2.5 million breast cancer deaths every year between 2020 and 2040. This is to be achieved by a combination of increased awareness by public health promotion, early diagnosis, and comprehensive breast cancer management [27]. The Global Cancer Observatory predicts an estimated number of 52,100 new cases of breast cancer by 2040 in Nigeria [28]. With the international efforts being made by the WHO and increased awareness of the breast cancer burden in Nigeria, we can be hopeful that these predictions are averted. There is a need for more funding to be made available to breast cancer research to increase life expectancy and achieve better outcomes. More research needs to be done to understand the role of the Nigerian genomic data in the efficacy of hormone-receptor-based therapy, and the quality of life of patients living with breast cancer.

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