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Breast Cancer Treatment in Resource Constrained Countries: a Zimbabwean Perspective

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Abstract

Purpose of Review Breast cancer is becoming a significant burden to the healthcare system in Zimbabwe. The financial toxicity of breast cancer treatment is a significant problem for patients even in the developed world. This review looks at the management of breast cancer patients in Zimbabwe relating it to the other developed nations.

Recent Findings Despite the tremendous progress made by science in the care of women with breast cancer over the past few decades, most of the women in Zimbabwe are yet to benefit from this progress. There is poor access to modern screening methods, quality chemotherapy drugs and reliable radiotherapy services and lack of evidence-based medicine derived from our own settings. Out-of-pocket payments for healthcare are still the major health-funding model, and it denies most women access to quality and appropriate healthcare services.

Summary An increase in the number of medical specialists treating breast cancer over the past 10 years has resulted in a slight improvement in diagnostic and treatment capability of the country; however, resources for breast cancer management in Zimbabwe remain far from being adequate. Universal health coverage (UHC) if achieved through the drive to attain the 17 Sustainable Development Goals (SDGs) will improve care for breast cancer patients.

Keywords Breast cancer · Financial toxicity · External validity · Chemotherapy · Radiotherapy

Introduction

Epidemiology

Breast cancer is the second commonest cancer among female Zimbabweans according to the 2016 Zimbabwe National Cancer Registry, and there has been a steady increase in the number of newly diagnosed breast cancer cases in Zimbabwe since 2016 [1]. Part of this may be related to improve patient awareness, as educational programs and use of the media space have led to more people seeking medical attention. Thus, the predicted increase in cancer cases in developing countries by 2050 may indeed be good news for the African population [2].

While this is to be lauded, as is the increase in clinical oncologists in Zimbabwe that has paralleled, the increase in breast cancer incidence, diagnostic and treatment capabilities remains inadequate in our country to take care of the growing demand. For example, the ratio of a clinical oncologist to new cancer patient in Zimbabwe was 1:66 compared with 1:53 and 1:50 in the UK and the USA respectively.

The efforts by the locally registered oncologist to take part in the training of clinical oncologists through the local university are bearing fruit in small but meaningful ways. From just two clinical oncologists in 2008, we are expecting to have 14 new clinical oncologists by 2020 in Zimbabwe. Still, the threat of brain drain is very real, similar to other developing countries [3•], as these medical professionals are sought after to fill the critical shortage of oncologists worldwide [4].

Screening of Breast Cancer

Zimbabwe does not have the capacity to offer a comprehensive national breast cancer screening program. There

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are few governmental facilities that offer mammography, often located at central hospitals, to which a limited number of women have access. The private sector has more than 5 mammogram machines, which are mostly located in the capital city and accessed by the private clients who are fortunate to have private health insurance or the ability to pay out of pocket for this service. Hence, the clinical breast examination should probably remain the mainstay of screening for breast cancer in our country [5••].

Histological Diagnosis

Pathology services are available at government centres in the two major cities. However, at these centres, immunohistochemistry testing for ER, PR and HER-2 is sporadic. These services are offered, however, at private laboratory services at a cost beyond the reach of the majority of patients. These tests, while routine in the Western world, are in our setting mainly useful for decisions regarding the use of endocrine therapy, as most patients with HER-2 positive cancers cannot afford anti-HER-2 treatment regimens. Historically, our patients were empirically started on tamoxifen without hormonal testing and this was because, the test was not readily available in the public sector and tamoxifen was a relatively cheap drug that was available, and evidence shows, it may provide a chemopreventive effect, even for patients who are hormone receptor negative [6]. However, we have since moved from this practice as shown in the results of a local study which showed only 1/220 patients seen over a 3-year period was commenced on tamoxifen without ER/PR testing [7].

Staging Investigations

Staging is a key component of breast cancer management; hence, all patients should be adequately investigated. Our patients in the public sector have limited access to CT and/or MRI scans. The majority of patients cannot afford these tests that are readily available in private practices and are staged using chest X-rays and ultrasound scan of the abdomen and pelvis. Bone scanning is not constantly available; this is offered only at one centre in the country and sometimes, this service is not available because the radioisotope has to be sourced from outside of the country.

While part of the aetiology of 'worse outcomes' seen in low-to-middle income countries may be related to late presentation and the lack of manpower and treatment facilities, the use of inferior staging investigations may also contribute as our patients may harbour undetected metastatic disease at the presentation which may have been elucidated on more sensitive screening tests.

Surgical Management

Modified radical mastectomy is the most common surgical treatment option for patients with breast cancer in Zimbabwe. Breast conservation surgery (BCS) is rarely done mainly because most patients present with locally advanced large tumours. Though neoadjuvant chemotherapy can be given to reduce the size to allow for breast-conserving surgery, most patients prefer radical mastectomy, often because, in so doing, they may be able to avoid radiation treatment, which is not only expensive but sometimes not readily available [8–10].

While most breast cancer patients with clinically negative axillary nodes are offered sentinel node biopsy in the developed world, this is rarely an option for patients in the public sector in Zimbabwe due to late presentation. Our surgeons have the ability to do this procedure; however, given the small number of patients seen in the private sector (for whom this would be appropriate), they have not been able to create high-volume centres, where they are able to hone their skills [11]. It is hoped, however, with the drive to improve the national screening programs, that the number of patients eligible for this procedure will increase.

Adjuvant Systemic Therapy

A significant proportion of our patients at least 20% delay the initiation of adjuvant treatments after surgery, with patients coming more than 2 months after surgery which can compromise treatment outcomes for breast cancer patients [12••]. Because of fear of chemotherapy and the myths about it, some women will try to avoid adjuvant chemotherapy especially if staging investigations shows no clinical evidence of disease [13•], opting instead for alternative therapy, including herbal treatments, and traditional/faith healing and faith healing. Such views are particularly prevalent among highly religious groups especially those who believe in miracles [14, 15]. Some of these patients may then change their mind and decide to come for the adjuvant treatment even 3 years after mastectomy—a scenario which presents a management dilemma as there are no good studies that quantify the benefit of chemotherapy in such situations.

Multidisciplinary team (MDT) discussions have been shown to improve breast cancer outcomes by facilitating communication and consultation between specialties. The American Society of Clinical Oncology, through its international division, conducted a multidisciplinary cancer management course in Zimbabwe in 2015 [16•]. While this course improved the quality of our MDTs, given the low number of oncologists, the MDT may delay treatment for some patients especially when the MDT meetings are not held frequently. While we try to hold the MDTs weekly, we sometimes fail to meet this obligation due to our numbers

and workload. We are also taking part in a number of the international online MDTs with a number of institutions including the IAEA and Global Cancer Institute.

Oncologists in Zimbabwe have access to the latest data on studies that are practice changing, but these studies are often carried out in the developed countries where most of the participants are Caucasian and other races are an insignificant subgroup in terms of numbers [17]. Therefore, it is unclear whether the results of these trials will be externally generalizable to Zimbabwe, and unfortunately, these studies may not be readily replicated in our setting, where there is significant poverty, poor access to healthcare facilities, lack of appropriate diagnostic services, poor social supportive services and cultural values that may temper patient participation in clinical trials. Further therapies developed elsewhere need to be viewed in the local context. For example, while dose-dense chemotherapy has been found to be beneficial to some patients in Western clinical trials, such regimens may not be ideal for some Zimbabwean women who come from areas with poor sanitation. In these women, such protocols would increase the risk of infection, particularly given that granulocyte-stimulating factors are beyond the reach of the majority of the patients.

The world has seen a tremendous improvement in the management of breast cancer with the addition to the treatment options of targeted treatment like anti-HER-2 agents, immunotherapy and cyclin-dependent kinases inhibitors [17]. Most of the studies of these biological molecules are tested in trials that do not include proportionally all races and ethnical subgroups, to allow for generalizability among these groups [18]. We however extrapolate the success of these drugs to all breast cancer population of similar stages.

Unfortunately, most pharmaceutical companies generally do not afford Zimbabwean or other African patients the opportunity to take part in drug trials, often justified by the fact that we are not a significant market for cancer drugs. In 2015, however, the World Health Organization (WHO) added trastuzumab to the essential drug list (core list), as an efficacious, safe and cost-effective medicine for breast cancer [19••]. This means that the African market may become more sizeable, and hopefully, more data about the efficacy and toxicity in our population will come from post-marketing reporting [20].

Still, the cost of trastuzumab is beyond the reach of most Zimbabweans; the annual cost of the drug is above the annual salary of most government workers. Further, by the time patients are to start adjuvant therapy, most of them will have used all their annual benefit of the standard medical insurance covered.

Indeed, financial issues play a significant role in determining therapy in the adjuvant setting. After the failure of first-line chemotherapy, most patients do not have access to the relatively expensive second-line chemotherapy options. Even the second-line hormonal treatment is beyond the reach of most patients. Generic drugs and biosimilar products are currently being used by most oncologists. A lot of efforts have been expended to ensure that the patient gets quality and equivalent products [21••]. The Medicine Control Council of Zimbabwe does a good job to make sure that only properly registered drugs find their way onto the market. However, there is always a chance that some drugs are smuggled into the country by unregistered players who may not pay close attention to quality or proper storage of drugs [22]. This is a problem for most developing countries and Zimbabwe is not spared. Thus, we may not always be sure about the quality of drugs that are given to our patients, which can have an adverse effect on the outcomes of treatment [23].

Radiotherapy Services

Radiotherapy is a critical part of breast cancer management, especially in our setting where patients present with locally advanced disease and almost always need radiotherapy. There is, however, poor access to radiotherapy facilities in most developing countries including Zimbabwe [24]. At our best, we have an access ratio of 1 machine per 2.8 million people when all our six machines are functional. This ratio drops to about 1 machine for 8.5 million when we have equipment breakdowns for our current population of about 16 million.

Treatment breaks during radiotherapy have been proven to compromise the outcome of breast cancer to radiation treatments [25•]. To guarantee uninterrupted radiation treatment, there is a need for a reliable power supply, well-maintained machines with service warranties and onsite engineers. Sadly, in Zimbabwe, patients often have long treatment breaks due to machine breakdowns. Efforts are made to compensate for these treatment breaks using appropriate radiobiology calculations. However, this may not be adequate if the treatment breaks are too long.

The radiotherapy techniques for breast cancer has evolved over the past few decades with most centres moving from 3D treatment techniques to more advanced techniques like IMRT, proton treatment breath holding techniques and adaptive radiotherapy [26].

Zimbabwean centres are still lagging behind, but have moved away from 2D treatment techniques to 3D treatment for most cancers including breast. Machines available in Zimbabwe have the capability of delivering these advanced techniques, but due to inadequate funding, the hospitals have not been able to buy the necessary software to allow migration to these types of treatments. Still, staff members of the radiation oncology team have received training in anticipation of the migration to these new treatment technologies.

The Impact of Health Financing Models on Breast Cancer Treatment

Zimbabwe is one of the developing countries struggling to meet the 17 Sustainable Development Goals (SDGs) set by the WHO and the United Nations to try and improve the quality of life of its citizens [27••]. There is a high unemployment rate and the economy has not been performing well. The low employment rates mean that very few people have private medical insurance, and the poor economic status and low tax base related to unemployment restrict the resources the government has to finance health services. The social services sector is inadequately funded; hence, most patients pay for healthcare out of pocket.

State facilities have high volumes of patients and suboptimal quality of services. Despite being highly subsidized, patients at these facilities still have to pay out of pocket for some services. The private sector is high cost—well beyond the reach of many Zimbabweans. This leaves the poor and vulnerable and with a high financial risk for healthcare services. The cost of breast cancer management (from screening, diagnosis, treatment and palliative care) is a huge burden to most. Hence, financial toxicity is very high for Zimbabwean patients.

To address this important issue of health financing challenges, the WHO proposed that nations consider Universal Health Care with access to healthcare services for all citizens backed by some National Insurance Scheme [28]. This however is a still a challenge for Zimbabwe as the country is currently grappled with a poorly performing economy.

Conclusions

The burden of breast cancer is high in Zimbabwe and indeed in most African countries, although we are only diagnosing a fraction of these patients due to a myriad of challenges currently faced by the healthcare sector. The higher incidence rates currently recorded are likely due to improved access to screening facilities. While it is hoped that this will correlate with an earlier stage at presentation and better outcomes, more studies need to be done in our setting so that we are able to generate evidence data based which is valid to the local population. Finally, as financial burdens remain a significant factor affecting treatment, it is hoped that improved healthcare funding and adoption of the universal health system model of healthcare will increase access to quality care, increase ancillary service in breast cancer treatment and reduce the financial burden that patients with breast cancer are exposed to during the long journey of treatment.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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