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REVIEW

Breast cancer in women in the Democratic Republic of the Congo: Current state of knowledge

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Abstract: Breast cancer (BC) is a major health problem with an increasing trend in prevalence and mortality worldwide. It is the most common of female cancers in the world, and thus ranks first in both developed and developing countries. Current knowledge on the epidemiology and biological aspects of breast cancer in women in the Democratic Republic of the Congo remains insufficient and poorly documented. Given the trend towards urbanization of the Congolese population, it is likely that current data will change in the coming decades, due to a foreseeable change in risk factors for the disease. Therefore, the establishment of a cancer registry is necessary in the Democratic Republic of the Congo (DRC) health system for better epidemiological monitoring of cancer and surveillance data necessary for the development of cancer control policies and their integration into primary health care. Strategies that include building local capacity in terms of human resources, equipment and technology transfer could lead to new concepts and therapies adapted to the Congolese geographical context.

Keywords: breast cancer, epidemiology, women, Democratic Republic of the Congo (DRC)

1 Introduction

Breast cancer (BC) is a major health problem with an increasing trend in prevalence and mortality worldwide. It is the most common of female cancers in the world, and thus ranks first in both developed and developing countries. It accounts for 23% of female cancers and 10.9% of all human cancers worldwide [1]. By 2020, according to recent estimates by the World Health Organization (WHO), there were 2.3 million women with BC and 685,000 deaths from BC worldwide. By the end of 2020, 7.8 million women alive had been diagnosed with BC in the past five years, making BC the most common cancer in the world. Globally, women lose more years of life (disability-adjusted life expectancy) due to BC than any other type of cancer [2]. Over the past two decades, epidemiological reports published in different parts of the world show a significant increase in BC mortality [3]. BC is present in all countries of the world and affects women of all ages from puberty (although the incidence rate increases as age progresses) [2].

BC is one of the leading causes of cancer deaths in Africa and has the highest incidence of all cancers. Although BC is the most common cancer among women worldwide, fatality rates are highest in low- and middle-income countries [4]. There are few data on BC in Africa in general and Central Africa in particular. Of 46 WHO Member States in sub-Saharan Africa (SSA), only 20 (43.4%) have active cancer registries, covering a wide range of coverage and completeness [5, 6]. In 2018, a recent meta-analysis conducted in 22 African countries by Adeloye *et al.* [6] noted significant variations in the reported incidence of cancer in women between population and hospital cancer registries. These authors found that in hospital records, the overall combined incidence rate was estimated to be 23.6 per 100,000 person-years (95% confidence interval [95% CI]: 18.5-28.7). North Africa and the SSA had relatively comparable rates of 23.2 per 100,000 (95% CI: 6.6-39.7) and 24.0 per 100,000 (95% CI: 17.5-30.4), respectively. The overall aggregated incidence of BC from population-based registries was 24.5 per 100,000 (95% CI: 20.1-28.9). The incidence of SSA was lower at 22.4 per 100,000 (95% CI: 17.2-28.0) than in North Africa at 29.3 per 100,000 (95% CI: 20.0-38.7). In East and West Africa, the incidences were 28.0 (95% CI: 21.7-33.7) and 24.2 (95% CI: 15.4-33.0) per 100,000, respectively. Southern Africa had an incidence of 19.0 (95% CI: 10.1-27.8), while Central Africa had an incidence of 13.4 (95% CI: 7.2-34.1) per 100,000. These authors found

that incidence rates increased significantly between 2000 and 2015 in both registries [6]. This meta-analysis reported that the mean age ranged from 30.6 to 60.8 years, with over 33% and 81% of the population aged 30 to 49 years and 30 to 59 years, respectively [6]. According to Jedy-Agba *et al.* [7], many cases of BC in SSA are diagnosed between 35 and 49 years of age, and many patients have presented with advanced BC.

2 Breast cancer situation in the DRC

According to recent estimates (July 2020), the total population of the Democratic Republic of the Congo (DRC) is estimated at 101,780,263 inhabitants, i.e. a density of 43.36 inhabitants/km^2 [8]. The population of the DRC is very young: half the population is under 15 years of age. Those over 65 represent less than 3% of the country's total population [9]. The rate of urbanization, i.e. the urban population as a proportion of the total population of the DRC, increased from 28.8% in 1970 to 30% in 1984, to 32% in 2007 [10]. The 2020 estimate is 45.6%. Urbanization continues at a rate of 4.53% per year [8]. The mortality rate in the general population is estimated at 8.4 deaths per 1,000 population. Life expectancy is 61 years in the general population (59.3 years for men and 62.8 years for women); access to basic health services is 28.7% (28.5% in urban areas and 28.7% in rural areas) [8]. In the DRC, there are few data on cancer in general due to the lack of a national cancer registry that would collect all data from hospitals and non-governmental organizations. Since November 2020, the DRC has had a National Center for the Fight against Cancer (CNLC) which serves to support cancer control. A number of initiatives are being undertaken by both the State (by integrating the fight against cancer into the national budget) and the private sector (for example by providing the country with a radiotherapy center). Histopathology and immunohistochemistry laboratories were established.

In 2006, a study reported that BC was the most common cancer among women in Kinshasa [11]. According to WHO data from 2014, 30,700 people die each year from different types of cancer in the DRC. More than 55% are women and cervical cancer (27%) and BC (16%) were the top two [12]. Mashinda *et al.* [13], in their survey from 1969 to 2008 based on the registers and protocols of biopsies consulted in the pathological anatomy laboratories of the Kinshasa University Clinics and the General Reference Hospital in Kinshasa, found that cancers of the cervix (27.7%) and of the breast (13.7%) were the most prevalent in women. During the 10-year period from June 2010 to June 2020, 5,801 cases of cancer (all sexes) were recorded in five pathological anatomy laboratories in Kinshasa, Katumbayi *et al.* [14] recorded 3,163 cancers in women, of which BC was predominant (49.9%). Lukanu *et al.* [15], in a recent study of 914 cancer patients at IME-Kimpese Hospital, the only hospital in Central Kongo Province with a histopathology department, reported that the breast was the most affected organ with 26.3% of cases and mainly in women (234/240).

As regards the characteristics of patients with BC, a study carried out with 430 cases in 3 hospitals in the city of Kinshasa (Saint Joseph Hospital, Kinshasa Provincial Reference General Hospital and Nganda Hospital Center) during the period from 1 January 2005 to 31 December 2015 reported that the mean age of 48.5±10.2 years, lymph node invasion was encountered in 66.3% and 94.4% of the patients had consulted at advanced stages (III and IV) [16]. As for the immunohistochemical aspects of BC, in a series of 50 women with BC, Mbala had found that estrogen and progesterone receptors were detected in 86% and overexpression of the human epidermal growth factor receptor 2 (HER2) was absent in 90% of the cases [17].

3 Difficulty in diagnosis and care in sub-Saharan Africa and the DRC

Successful treatment stems from the multi-pronged approach to this disease, with improved treatment options over decades. Management of BC has evolved rapidly over the last 15 years, thanks to a better understanding of tumor biology. Several types of treatment such as immunotherapy, vectorized chemotherapy, hormone therapy sensitized with mammalian target of rapamycin (mTOR) inhibitors were discovered and implemented. They are thriving and are commonly referred to as "targeted therapies". During the latter, the treatments are personalized and administered according to the tumor molecular profile of each patient [21, 22]. A judicious combination of systemic therapy (including the use of chemotherapy, hormone therapy, targeted or molecular therapy and immunotherapy alone or in combination) and local therapy with radiotherapy and/or surgery when indicated is the best approach for BC patients [23]. Invasive BC involves a heterogeneous group of patients and therefore is very difficult to manage. Thus, an individualized approach is necessary to achieve good results [22, 23].

In developed countries, for nearly two decades, the incidence and mortality of BC has been declining, thanks in particular to screening allowing earlier diagnosis, the control of certain modifiable risk factors (*e.g.* reduced prescribing of hormone replacement therapy, smoking cessation, reduced alcohol consumption, physical activity, reduced sedentary status, reduced overweight, adoption of a diversified and balanced diet, *etc*.) and recent significant therapeutic advances (in both adjuvant and metastatic situations) [22,24]. These major advances in the management of BC include targeting hormone receptors and HER2, knowledge of the mechanisms of hormone resistance and coupling chemotherapy to an anti-HER2 antibody (TDM-1) increasing its selectivity towards cancer cells and improving its tolerance [16].

In developing countries including the DRC, there is no national strategy for cancer control planning, which requires information on the precise diagnosis of cancer and documentation of all prognostic factors relevant to a tumor. Accurate diagnosis requires timely and adequate pathological input [25]. Diagnosis remains the cornerstone of treatment. Even advanced cancer requires confirmation of breast carcinoma by pathological diagnosis, as other benign or malignant tumors can mimic BC, for example lymphoma, phylloid tumor or untreated infection, and all these treatment approaches merit different treatment approaches [26]. However, current reports show a significant gap in professional and technical pathology services, with low pathologist/population ratios in SSA [27]. These ratios in SSA vary from one pathologist for 84,133 people in Mauritius to one pathologist for 9,264,500 people in Niger. For the DRC, this report indicated that this ratio was of one pathologist to 4,938,733 persons [27]. In addition, countries such as Somalia, Benin, Eritrea and Burundi have only one or no pathologists in the country [28].

In addition to this lack of pathology, most patients in SSA have advanced disease (stage III and IV) [7, 29–33]. The goal of the WHO's new global initiative on BC control is to reduce BC mortality worldwide by 2.5% per year, and thus prevent 2.5 million BC deaths globally between 2020 and 2040. The achievement of these objectives is based on three pillars: health promotion for early detection; timely diagnosis; and comprehensive management of BC [2]. But this achievement comes up against several obstacles in developing countries. The challenge of timely and accurate diagnosis of BC is even greater in low-resource areas such as the DRC where access to pathological investigations is not guaranteed. Coverage of basic laboratory services is fundamental to achieving these objectives. Yet comprehensive laboratory services are not available for large percentages of the SSA population. In addition, several other factors may also contribute to the difficulty of correctly diagnosing BC in the context of limited resources. These include clinical manifestations that are varied and appear late due to the lack of systematic screening and lack of information on BC among some healthcare workers and the general public (lack of awareness of BC symptoms and their severity, fear of a cancer diagnosis, use of traditional healers), lack of access to health care services (due to geography, financial concerns, quality of services) [27, 29, 34, 35]. Thus, most of the time, treatment is initiated on the basis of an imprecise and/or late diagnosis which results in the use of inappropriate treatment. The latter in turn leads to a long hospital stay with an increase in the costs of care initially already expensive in a community where 70% of the population lives below the poverty line, a bad evolution of BC with local and remote metastases (lungs, liver, bone, brain) and death (Figure 1). As a result, most women in SSA are undergoing mastectomy and hormone therapy or adjuvant chemotherapy (sometimes not indicated) and many others are receiving only palliative care because the tumor is advanced and inoperable [32].

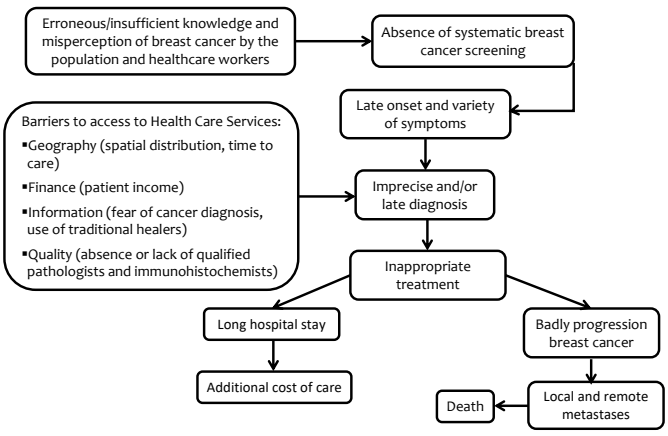

Figure 1 Conceptual model of the breast cancer management problem in low-resource settings

4 Conclusion

Although BC is the most common cancer in women, very few studies have been conducted in the DRC where current knowledge of the BC epidemiology remains inadequate and poorly documented in women. However, to address women's health problems, advanced epidemiological studies are essential for policy makers, public health experts and program managers. Therefore, the establishment of a cancer registry is necessary in the DRC health system for better epidemiological monitoring of cancer and surveillance data necessary for the development of cancer control policies and their integration into primary health care. Hence the involvement of strategies including the strengthening of local capacities in terms of human resources, equipment and technology transfer is very crucial. This is very important for the development and strengthening of national guidelines for the management of BC in Congolese women in general.

Abbreviations

BC: Breast cancer
DRC: Democratic Republic of the Congo
HER2: human epidermal growth factor receptor
SSA: sub-Saharan Africa
WHO: World Health Organization

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