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Frequency and pattern of gynecologic cancers from 2010 to 2014 in Beira, Mozambique

Częstość występowania i profil nowotworów kobiecych narządów płciowych w latach 2010–2014 w mieście Beira w Mozambiku

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Abstract

Objective: Gynecologic cancers represent a large health, social and economic burden worldwide. In low-income countries, particularly in Mozambique, little data is available and no effective policies are implemented to fight these diseases. Our objective was to trace the epidemiological profile of gynecologic cancers from 2010 to 2014 in Beira, Mozambique. **Methods:** We retrospectively reviewed the registers of the Department of Pathology of Central Hospital of Beira to identify all cases of gynecologic malignancies recorded from January 2010 to December 2014. **Results:** Most of the diagnosed female cancers (43.4%) were gynecologic and, among these, cervical cancer was definitely the most commonly reported cancer every year, ranging from 86.7% in 2013 to 93.3% in 2014. **Conclusion:** As in many low-income countries, the access to screening programs for gynecologic cancer is not effective in Mozambique; therefore urgent preventive policies are crucial to address this emergent issue.

Keywords: gynecologic cancers, low-income countries, epidemiology, cervical cancer

Streszczenie

Cel: Nowotwory kobiecych narządów płciowych stanowią istotne obciążenie zdrowotne, społeczne i ekonomiczne na całym świecie. W krajach o niskich dochodach, w szczególności w Mozambiku, brak jest zarówno dostępnych danych, jak i skutecznych strategii walki z tymi chorobami. Celem badania było prześledzenie profilu epidemiologicznego nowotworów ginekologicznych w latach 2010–2014 w mieście Beira w Mozambiku. **Metoda:** Autorzy dokonali retrospektywnego przeglądu rejestrów medycznych Oddziału Patologii Szpitala Centralnego w Beirze w celu wyodrębnienia wszystkich przypadków nowotworów kobiecych narządów płciowych odnotowanych w okresie od stycznia 2010 do grudnia 2014 roku. **Wyniki:** W większości przypadków (43,4%) rozpoznane u kobiet nowotwory dotyczyły narządów rodnych, przy czym rak szyjki macicy był zdecydowanie najczęściej odnotowywanym nowotworem w każdym roku (od 86,7% w 2013 do 93,3% w 2014 roku). **Wniosek:** Podobnie jak w wielu krajach o niskich dochodach, również w Mozambiku dostęp do programów przesiewowych nowotworów narządów rodnych jest ograniczony – niezbędne jest pilne podjęcie działań prewencyjnych.

Słowa kluczowe: nowotwory kobiecych narządów płciowych, kraje o niskich dochodach, epidemiologia, rak szyjki macicy

INTRODUCTION

Gynecologic cancers are a spectrum of malignancies affecting the cervix, vulva, ovaries, endometrium, vagina, and placenta, with a high rate of mortality worldwide, which varies significantly depending on the region, age and the stage of presentation.

Cervical cancer is the third most common cancer among women and a leading cause of mortality worldwide, with 265,653 deaths estimated in 2012⁽¹⁾. Eighty-three percent of cases occur in the developing world, where cervical cancer accounts for 15% of female cancers, compared to just 3.6% in developed countries⁽²⁾. This large decline of cervical cancer incidence and mortality in high-income countries is largely credited to effective screening programs and the Pap test⁽³⁾.

Vulvar neoplasia accounts for 4–5% of all malignant tumors of the female genital tract and it is estimated that more than 5,000 cases were diagnosed in the United States in 2015, with approximately 1,000 deaths⁽⁴⁾. In developing countries, such as Algeria and Zimbabwe, the incidence varies from 0.1 to 1.6 per 100,000 population, respectively⁽⁵⁾. It is usually diagnosed in older women, who often have lichen sclerosus et atrophicus or differentiated vulvar intraepithelial neoplasm but, unfortunately, the rate of diagnosed young women is on the rise due to persistent infection with HPV and HIV⁽⁶⁾.

The term “ovarian cancer” summarizes a heterogenous group of malignant epithelial tumors and, despite advances in medicine, it remains the most fatal gynecologic malignancy^(7,8). Malignant ovarian germ cell tumors occur predominantly in girls, adolescents, and young women and are often unilateral tumors of early stage, although advanced-stage disease occurs in approximately 30% of patients⁽⁹⁾. Previous studies listed well known risk factors such as increasing age, family history of ovarian and breast cancer, nulliparity, and tobacco smoking⁽¹⁰⁾. Moreover, it has a strong association with breast and anal cancer and, recent studies showed the possible involvement of *BRCA2* gene mutation⁽¹¹⁾. Subtypes of ovarian cancer can originate from the fallopian tube (high-grade serous carcinoma) or the sex cords (sex cord stromal tumors)^(12,13). Ovarian cancer incidence rates vary remarkably depending on geographic locations. Countries with the highest rates are those in Scandinavia, North America and Israel and the lowest rates were found in developing countries and Asia⁽¹⁴⁾.

Endometrial carcinoma is the most common gynecologic malignancy in industrialized countries and the incidence is still rising⁽¹⁵⁾. Frequently, this cancer is diagnosed in older patients, with a higher incidence in urban rather than rural environment. Moreover, endometrial hyperplasia is frequently diagnosed in peri- and postmenopausal patients, identified due to abnormal uterine bleeding⁽¹⁶⁾.

Vaginal cancer is less common, accounting for approximately 2% of all cancers of the female genital tract. It mostly affects women over 60 years, and only 10% to 15% of those under 50 years⁽¹⁷⁾. The most common types of vaginal

cancer are squamous carcinoma (80% to 90%) and adenocarcinoma (4% to 10%), and recent evidence suggests the role of HPV infection⁽¹⁸⁾.

Finally, gestational trophoblastic neoplasms usually occur in child-bearing age women, have high malignant and metastatic potential and can be fatal⁽¹⁹⁾.

In high income countries, the survival of patients is improving due to prevention, early diagnosis and different treatment strategies, whereas most women with cancer in developing countries have advanced, untreatable disease and minimal access to anticancer therapies. Furthermore, in low-income countries, in most cases, there is no perception of the burden and the profile of these diseases. The aim of this study is to perform a retrospective analysis at the Department of Pathology of Beira Central Hospital (BCH), Mozambique, in order to trace the epidemiological profile of gynecologic cancers from 2010 to 2014.

MATERIAL AND METHODS

Setting and population

Beira is the second largest city of Mozambique with about 500,000 inhabitants, of which 17% are less than 5 years old. BCH is a 733-bed government tertiary referring and teaching hospital for the central region of the country (population of about 7 million) in Mozambique and the second hospital in the country⁽²⁰⁾.

Data collection

Data registers of BCH's Department of Pathology were retrospectively reviewed to identify all cases of gynecologic malignancies recorded from January 2010 to December 2014. Data extraction was performed by a trained external member (not involved in clinical activities or in the study design) using a piloted clinical report form in order to ensure consistent data collection regarding gynecologic diseases. Information based on the site of affliction, patient's age and histopathological diagnosis according to the International Federation of Gynecology and Obstetrics (FIGO) classification was collected.

Statistical analysis

Descriptive statistics were used to compare baseline characteristics of the study groups. The chi-square test was used for binary variables. A *p*-value <0.05 was considered statistically significant. All data were analyzed with SPSS 17.0 for Windows (IBM SPSS Statistics, IBM Corporation, Chicago, IL).

RESULTS

A total of 2,112 new histologically diagnosed cancer cases were registered at the Department of Pathology at the Central Hospital of Beira between January 2010 and December

2014 (Tab. 1). Female cancers accounted for 56.3% and, among these, 517 (43.4%) were gynecologic cancers. The sites of involvement included the cervix (460 cases, 89%), vulva (30, 5.8%), ovary (9; 1.7%), endometrium (6; 1.2%) vagina (5; 1%) and placenta (7; 1.3%) (Tab. 2). Cervical cancer was definitely the most commonly reported cancer each year, ranging from 86.7% in 2013 to 93.3% in 2014. Age distribution is reported in Tab. 3. The average

age of females with cervical cancer, the most representative group, was 43 ± 12.7 years, ranging from 20 to 85 years. The youngest group was represented by women with placental cancer with an average age of 29.6 ± 10.8 years (17–48 years) while the oldest one was that of endometrial cancer with an average age of 58.2 ± 18.1 (34–81 years). Only 92 histopathologically diagnosed cervical precancerous lesions were reported during 5 years (Tab. 4).

Year	Total cancer N	Male cancer N (%)	Female cancer N (%)	Gynecologic cancer N (%)*
2010	375	165 (44)	210 (56)	83 (22.1)**
2011	420	166 (39.5)	254 (60.5)****	106 (25.2)**
2012	438	185 (42.2)	253 (57.8)***	111 (25.3)**
2013	413	191 (46.2)	222 (53.8)	98 (23.7)**
2014	466	215 (46.1)	251 (53.9)	119 (25.5)**
Total	2112	922 (43.7)	1190 (56.3)	517 (24.4)**

* Percentage referred to the total cancer.
 ** $p < 0.01$ vs. total cancers.
 *** $p < 0.05$ vs. male cancers.
 **** $p < 0.1$ vs. male cancers.

Tab. 1. Distribution of cancers at Central Hospital of Beira in 2010–2014

Year	Total N (%)	Cervix N (%)	Vulva N (%)	Ovary N (%)	Endometrium N (%)	Vagina N (%)	Placenta N (%)
2010	83	74 (89.2)*	3 (3.6)	2 (2.4)	1 (1.2)	3 (3.6)	–
2011	106	92 (86.8)*	8 (7.6)	1 (0.9)	2 (1.9)	–	3 (2.8)
2012	111	98 (88.3)*	6 (5.4)	3 (2.7)	–	2 (1.8)	2 (1.8)
2013	98	85 (86.7)*	8 (8.2)	3 (3.1)	1 (1)	–	1 (1)
2014	119	111 (93.3)*	5 (4.2)	–	2 (1.7)	–	1 (0.8)
Total	517	460 (89)*	30 (5.8)	9 (1.7)	6 (1.2)	5 (1)	7 (1.3)

* $p < 0.01$ vs. total.

Tab. 2. Gynecologic cancer profile at Central Hospital of Beira in 2010–2014

Type	Number of cases	Mean age	Age range
Cervix	460	43 ± 12.7	20–85
Vulva	30	38.3 ± 10.2	21–65
Ovary	9	30.9 ± 13.2	13–61
Endometrium	6	58.2 ± 18.1	34–81
Vagina	5	50 ± 21.2	35–86
Placenta	7	29.6 ± 10.8	17–48
Total	517	42.5 ± 13	13–86

Tab. 3. Age distribution of gynecologic cancer at Central Hospital of Beira in 2010–2014

Year	Cases number	Mean age
2010	22	32 ± 7.2
2011	29	36.4 ± 9.9
2012	7	41.6 ± 11.3
2013	5	37.2 ± 6.6
2014	29	37.1 ± 6
Total	92	36 ± 8.3

Tab. 4. Precancerous cervical cancer lesions

DISCUSSION

It is well known that gynecologic cancer, cervical cancer in particular, is very common in the developing countries with a high mortality rate⁽²¹⁾. The main reasons for this are the lack of prevention strategies, well-equipped diagnostic facilities and medical service as well as the lack of well-trained healthcare workers⁽²²⁾. In BCH, gynecologic cancers represent over 40% of all female cancers and, among these, cervical tumors account for almost 90%. Our data are consistent with the World Health Organization (WHO), which estimates that one million-plus women worldwide live with cervical cancer and, many of them have no access to health services for prevention, curative treatment or palliative care⁽²²⁾. The high prevalence of cervical cancer indicates the lack of awareness, especially among rural and poorer women, who are at an increased risk of invasive cervical cancer, because they often do not have access to crucial prevention, screening and treatment services. Moreover, from 2010 to 2014, the Department of Pathology recorded only 92 cases of precancerous lesions, rising concerns about the inequitable access to screening programs. Prevention is the strongest weapon against cervical cancer and the WHO declared vaccination and screening as an essential tool in the fight against this malignancy. It is crucial to develop effective strategies in order to prevent hundreds of unnecessary deaths. Safe and effective HPV vaccination is now available and has been adopted in many high-income countries, but only to a minimum in low income countries, such as Mozambique. Thus, preventive and vaccination campaigns need to be increased and improved in order to achieve the WHO goal of vaccinating over 30 million girls in more than 40 countries by 2020. Even though HPV vaccination reduces the risk of developing cervical cancer, regular screening remains essential. In fact, vaccination does not protect against all HPV types and, when vaccination coverage is low, non-vaccinated girls continue to be at risk.

Another important finding of our study is the diagnosis of ovarian cancer, which was low. In fact, the lack of early symptoms and high mortality rates in developing countries often lead to the lack of diagnosis. Considering the familial nature of this cancer, it will be interesting to conduct further and more adequate studies on the subject.

To the best of our knowledge, this is the first study in Mozambique focusing on gynecologic cancers. However, since it is a retrospective study in a developing country, several limitations reduce its possible impact: data are incomplete, it is not possible to calculate incidence and prevalence rates, clinical data are unavailable and, genetic and immunohistochemical relevant tests are not performed. Moreover, it is very likely that the number of diagnosed cancers is underestimated.

Despite these limitations, our findings showed a significant presence of cervical cancer in the years compared to other gynecologic tumors. Thus, considering the lack of health

service for oncologic patients, it is assumed that there is a high incidence of mortality caused by this tumor both in the present and in the years to come.

Regardless of the strategies that local and national health policies will be able to implement, the *conditio sine qua non* is the force of health systems in order to guarantee access to health services. Finally, to improve and increase the impact of future interventions, an operational research approach should be implemented to win the challenges against cervical cancer and HPV infection.

Conflict of interest

The authors do not report any financial or personal connections with other persons or organizations, which might negatively affect the content of this publication and/or claim authorship rights to this publication.

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