

Immunohistochemical Profile of Breast Cancer: A Retrospective Study in the Democratic Republic of Congo

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Abstract

Background: The management of breast cancer increasingly requires molecular classification based on immunohistochemistry. As breast cancer is a heterogeneous disease characterized by the accumulation of multiple molecular alterations that give each tumour its own phenotype and evolutionary potential, immunohistochemistry, as a complementary technique to morphological examination, determines the status of hormone receptors and on protein in tumour cells, which are predictive and prognostic markers of breast cancer. This technique is often little used in the Democratic Republic of Congo (DRC), as this study shows. The under-use of this technique due to a lack of equipment and/or human skills explains the paucity of epidemiological data available to date. **Objective:** Determine the immunohistochemical profile of breast cancer. **Methodology:** This is a retrospective study carried out in the Anapath Department of the NGANDA Hospital from January 1, 2020 to December 31, 2022, *i.e.* a 3-year period. **Result:** A total of 736 patients were registered in the hospitalization register of the Oncology Department of CH NGANDA for the period corresponding to the present study. Breast cancer was diagnosed in 110 patients, representing 14.9% of all cases. The mean age of the patients was 58.4 ± 8.2 years, with extremes ranging from 30 to 76

years. Breast nodules were the most common reason for diagnosis in 56.3% of cases, with Luminal A dominating in 17.3%. **Conclusion:** Breast cancer is a major public health problem. Worldwide, it is the most frequently diagnosed cancer in women and the leading cause of cancer-related death in women. In the Democratic Republic of Congo, because of the delay in consulting our patients and the weakness of systematic screening, patients are seen at an advanced stage of the disease. Treatment is multidisciplinary, involving surgery, radiotherapy, chemotherapy (including targeted therapies) and hormone therapy. Patient awareness and screening campaigns will contribute to a considerable reduction in the delay in diagnosis and the morbidity and mortality associated with breast cancer.

Keywords

Immunohistochemistry, Cancer, Breast

1. Introduction

The breast is the world's leading cancer site in women, with over 2.2 million cases reported in 2020. However, incidences vary from 27/100,000 in Central East Asia and Africa to 85-94/100,000 [1].

Its incidence in France is among the highest in Europe. While in most countries its incidence has been rising for over 40 years, in some others (USA, Canada, Australia, France...) it has been falling since 2000-2005 [2].

Possibly due to a significant reduction in hormone treatments at menopause, the decrease may be transient. It is also the leading cause of cancer death in women in almost every country except the most economically developed, where it is currently second only to lung cancer. That said, over the past thirty years in highly industrialized countries like France, breast cancer mortality has been falling. Taken together, early diagnosis and better treatment explain this success [3].

Breast cancer is a major health problem with a growing trend in prevalence and mortality worldwide. It is the most common cancer affecting women worldwide, and therefore ranks first in both developed and developing countries. Furthermore, in the Democratic Republic of Congo, the absence of a national cancer register is a serious handicap to the real epidemiological and clinical evaluation of breast cancer. Current knowledge of the epidemiology and biological aspects of female breast cancer in the Democratic Republic of 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 evolution in the disease's risk factors [4].

All patients with immunohistochemistry profile of breast cancer diagnosed at CH NGANDA.

Histological review

The samples were fixed with 10% formalin.

Using kerosene blocks, sections between 3 and 5 microns were cut, followed by staining with hematoxylin and eosin.

A histological review of the cases was carried out using light microscopy, specifying the histological type: infiltrating ductal carcinoma, carcinoma *in situ*, infiltrating lobular carcinoma, infiltrating papillary carcinoma, and malignant phylloides. Biological behavior: benign, intermediate and malignant forms.

Immunohistochemical study

Statistical analysis

Word processing and tables were entered using the HP brand computer, with Microsoft Office WORD 2016 software data.

Thus, the establishment of a cancer registry is necessary for the Democratic Republic of Congo health system for better epidemiological monitoring of cancer and the data needed to develop cancer control policies and integrate them into primary health care [5].

In 2008, Ministry of Health statistics revealed that breast cancer was the cause of 44% of deaths among women, and there are several types. But in many parts of the country, many women are unaware of this fact, which explains why many cases of breast cancer are diagnosed at an advanced stage [6].

With the advent of the national cancer control centre (CNLC), the availability of immunohistochemical markers for the diagnosis, prognosis and therapeutic orientation for the overall management of this cancer is the basis for the development of the current positive state of breast cancer diagnosis and treatment in the Democratic Republic of Congo. Its migration to the national cancer control programme would be desirable in order to raise awareness among healthcare staff in various fields, with a view to eliminating gaps in knowledge about the overall management of breast cancer [7] [8] [9].

2. Method

Type and period of study

This was a 3-year retrospective study at CH NGANDA.

Our study took place in the oncology department of CH NGANDA from January 1, 2020 to December 31, 2022, a 3-year period.

Case studies

The study population comprised all patients admitted to the oncology department of CH NGANDA who had been diagnosed with breast cancer.

Inclusion criteria

Analysis was performed with SPSS version 22.0 software.

Results were presented in **Tables 1-7** and **Figure 1 & Figure 2**.

Ethical considerations

The rules of confidentiality and anonymity have been respected.

3. Results

Immunohistochemical diagnosis of breast cancer was made in 110 patients,

representing 14.9% of all cases.

General characteristics of the study population

Table 1. Age distribution of cases.

Age (years)	Workforce	%
30 - 39	17	15.4
40 - 49	22	20
50 - 59	47	42.7
60 - 69	13	11.8
70 - 79	11	10
Total	110	100

The most vulnerable age group was between 50 and 59, with 42.7% or 47 cases.

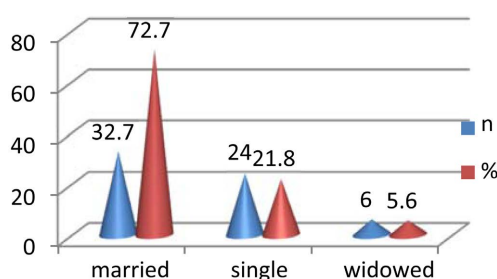


Figure 1. Distribution of patients by marital status.

Marital status was predominantly married, with 80 cases (72.7%).

Table 2. Distribution of cases by age of menarche.

Age at menarche	Workforce	%
≤12	21	19.1
13 - 14	73	66.3
>14	16	14.5
Total	110	100

This table shows that more than half the cases, *i.e.* 66.3% of our patients, were between 13 and 14 years of age at menarche.

Gynaecological-obstetric history in our study revealed that multigesta women constitute the most affected population, at 35.4%.

Table 3. Distribution of cases according to Gesture.

Gesture	Workforce	%
Nulligest	24	21.8
Primigest	7	6.3

Continued

Paucigest	23	20.9
Multigest	39	35.4
Large multigest	17	15.4
Total	110	100

Table 4. Distribution of patients according to parity.

Parity	Workforce	%
Nulliparous	28	25.4
Primiparous	11	10
Pauciparous	20	18.1
Multiparous	38	34.5
Large multiparous	13	11.8
Total	110	100

We can see from this table that multiparous females are in the majority with 34.5%.

Table 5. Distribution of patients according to other antecedents.

Other antecedents	Workforce
Cancer incidence in the family	11
Obese or overweight	2
Notion of breast-feeding	62
Alcohol	13
Contraceptives	13

In this picture, the majority of patients were breastfeeding in 56.4% of cases.

Table 6. Distribution of cases by receptor.

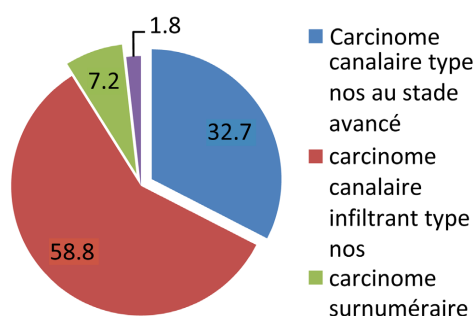
Receivers	Workforce	%
Hormonal	28	25.5
Estrogenics	27	24.5
Progesteronics	9	8.2
HER 2+ overexpression	6	5.5
Unrealized	40	36.3
Total	110	100

Hormone and estrogen receptors dominated in 25.5% and 24.5% of cases respectively.

Table 7. Distribution of cases by molecular classification

Parity	Workforce	%
Nulliparous	28	25.4
Molecular classification	Workforce	%
HER 2+	6	12.5
Luminal A	19	39.5
Luminal B	8	16.6
Triple negative	15	31.2
Total	48	100

The table shows that Luminal A dominated in 39.5% of cases.

**Figure 2.** Pathological features.

This figure shows that infiltrating ductal carcinoma dominated the histological types, accounting for 58.8% of cases. Right phylloid tumor was the least common type, accounting for 1.8% of cases.

4. Discussion

Breast cancer is the most common cancer in women, accounting for 16% of all female cancers. Every year, there are almost 1.38 million new cases and 458,000 deaths due to breast cancer. It is second only to cervical cancer.

In our series, during the study period from 1st January 2020 to December register of the Oncology Department of CH NGANDA for the period corresponding to the present study. Breast cancer was diagnosed in 110 patients, representing 14.9% of all cases.

In the Global Cancer Observatory series [10], breast cancer is the second most common cancer after brochopulmonary cancer, with a frequency of 11.5%. Coulibaly found a lower frequency than ours, *i.e.* 10.44 cases of breast cancer per year. It emerges that our series, although under-estimated, a contextual evaluation in one of capital's centres shows statistically high figures compared with the gloval or worldwide context, although limited in one corner, the global estimate of this breast cancer would be statistically more distant if all the country's institutions were considered (DRC).

In our series, the 50 - 59 age group dominated, with 47 cases (42.7%). The mean age of the patients was 58.4 ± 8.2 years, with extremes ranging from 30 to 76 years. In the literature, breast cancer occurs in young women, with an average age of between 42 and 53 years, depending on the region. Coulibaly found that the age of onset varied between 16 and 85 years, with a mean of 50.48 ± 13.07 years, which is statistically no different from that found in the Cameroonian, Malian, Senegalese, French and Iraqi series [6].

Kemeny in England [11] and Margaret in California, USA, report an average age of 55 to 60 years. This difference in average age between countries could be explained by higher life expectancy and the existence of a more efficient technical platform in developed countries [12].

According to marital status, this study shows that the patients most concerned are married women, with 80 cases (72.7%). Married women accounted for 32% and divorced 31 2022, a total of 736 patients were enrolled in the hospitalization women 30%. Mahomed BISSAN found that 87.5% of women were married, followed by 5% of widows. Lamine. I. Traoré found 66.5% of patients and Thiam. D (58) 66.1%. The husband is an important pillar in the medical-psychological care of his wife.

The multigestation population is the most affected, at 35.4%. Multiparous women are in the majority with 34.5%. M. BISSAN found that 58.66% of patients were multiparous, with an average of 5 children, and 61.25% had not used any form of contraception. The absence of risk factors does not eliminate the occurrence of breast cancer. In the literature, nulliparity or a first pregnancy after the age of 40 is a risk factor [4]. COULIBALY Zeinabou reports 1.06% nulliparity, which is statistically superposable with the nulliparity rates found in Malian, French and Cameroonian series. The majority of patients were breast-feeding in 56.4% of cases, and a family history of cancer was found in 10% of cases. In 5% - 10% of breast cancers, there is a genetic predisposition. A family history of breast cancer, the third risk factor, is found in around 20% of patients; the risk is particularly high when the cancer occurs in a first-degree relative under the age of 50 [10]. In the literature, only 5-10% of breast cancers are familial.

In the series by COULYBALY Z., 14 cases were found to have a family history of breast cancer, *i.e.* 21.28%, compared with 40.74% and 44.30% in the French and Central African series, with $P < 0.05$. This difference may be related to sample size. There was no statistically significant difference in other series [6].

Oral contraceptives and estrogen-progestin hormone replacement therapy (HRT) significantly increase the risk of breast cancer after five years of treatment. In our series, hormone and estrogen receptors dominated in 25.5% and 24.5% of cases, while Luminal A dominated in 17.3% of cases. COULIBALY Zeinabou found 8.51%, with no statistically significant difference from the rate found in a Cameroonian series with $P = 0.484$ [6]. On the other hand, it is lower than the rate found in the Malian [6], Ugandan and Central African series, with a statistically significant difference ($P < 0.05$). This difference could be explained by the fact that in the DEMOCRATIC REPUBLIC OF CONGO, the use of fami-

ly planning products is one of the lowest in the world.

5. Conclusions

This study has limitations that must be taken into when interpreting the results; firstly, the small sample size does not confer sufficient statistical power, and secondly, it is a monocentric study results cannot be extrapolated to other sites. Nevertheless, it is considered as a pilot study for other studies in this pathology.

Breast cancer is a major public health problem. Worldwide, it is the most frequently diagnosed cancer in women, and the leading cause of cancer-related death in women. In the Democratic Republic of Congo, because of the delay in consulting our patients and the weakness of systematic screening, patients are seen at an advanced stage of the disease. Treatment is multidisciplinary, involving surgery, radiotherapy, chemotherapy (including targeted therapies) and hormone therapy. Patient awareness and screening campaigns will contribute to a considerable reduction in the delay in diagnosis and the morbidity and mortality associated with breast cancer.

Authors' Contributions

All authors have read and approved the final version of this manuscript.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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