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Breast Cancer Survival at Brazzaville University Hospital from 2011 to 2020

Bolenga Liboko Alexis Fortuné[1,2,*], Zerbo Nina Assanatou[2], ème Jumelle[3], Ndingossoka Roslie Jessica[1], Jackson Ngombe Juliana Valentine Fortune[1], Ondele Dzeoko Ruth[1] and Rissia Ferdinand[1]

[1]*Department of Carcinology, Brazzaville University Hospital, Congo*

[2]*Faculty of Health Sciences, Marien Ngouabi University, Congo*

[3]*Department of Clinical hematology Oncology, Bogodogo University Hospital, Congo*

[*]***Corresponding Author:*** *Bolenga Liboko Alexis Fortuné, Department of Carcinology, Brazzaville University Hospital, Congo, Tel.: 242 05 630 36 97, E-mail: bolengaalexis@gmail.com*

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Summary

Introduction: Survival rates for patients with breast cancer have increased dramatically due to increasing exploration of the role and impact of prognostic factors. Five-year breast cancer survival rates vary considerably around the world, ranging from over 80% in high-income countries to less than 40% in low-income countries. The aim of our work was to determine the survival of patients with breast cancer, and the factors associated with this survival in the oncology department of the Brazzaville University Hospital.

Patients and Method: This was a monocentric, retrospective descriptive study conducted over a ten-year period, from January 1, 2011 to December 31, 2020. Survival curves were calculated using the Kaplan-Meier model, and factors associated with survival were studied using the Cox model. The significance level was set at 5%.

Results: 354 patients were included, 348 women and 6 men. The mean age at diagnosis was 47.25 years. 74.29% of patients had T4 stage at diagnosis; 78.53% had lymph node involvement, and 25.14% had metastatic disease. The 5-year overall survival rate was 19%. Survival was significantly associated with age ($p = 0.04$), general condition ($p = 0.03$), stage ($p = 0.003$), specific treatment ($p = 0.000$), immunohistochemistry ($p = 0.000$) and time to consultation ($p = 0.01$).

Conclusion: The incidence of breast cancer is rising worldwide. It is therefore essential to develop a screening strategy that will enable more effective management and better results.

Keywords: Breast Cancer, Survival, Brazzaville

Introduction

Breast cancer is the most common cancer in the world, with an incidence of 2.3 million new cases, and the fifth leading cause of cancer death, with 685,000 deaths in 2020 [1]. It is the leading cancer in women in the Republic of Congo, with 530 new cases and 241 deaths recorded in 2022 [2].

The survival rate of patients with breast cancer has increased considerably due to the growing exploration of the role and impact of prognostic factors [3].

Several authors have demonstrated the importance of early diagnosis in improving survival rates. In addition, the characterization of tumors' biological profile through immunohistochemistry, molecular biology and genomic studies has revolutionized management approaches [4-6].

Five-year survival rates for breast cancer vary considerably around the world, from over 80% in high-income countries to less than 40% in low-income countries [6]. In the USA, 5-year survival was 93% in 2016 [7]. In Japan and France, 5-year survivals of 88% were reported in 2014 [8] and 2016 [9] respectively. In Africa, lower survival rates have been observed [10]. In Morocco, a rate of 40% was reported in 2015 [11]; South Africa in 2018 noted a 5-year survival of 61% [12]. Benin in 2021, and Cameroon in 2023, described rates of 59.22% and 58.60% [13, 14].

Several studies have identified various prognostic factors for survival in breast cancer, including age at diagnosis, stage of disease, number of lymph nodes invaded, tumor size and grade, type of adjuvant treatment (radiotherapy, chemotherapy, hormone therapy), and the presence of metastases and recurrences [6-8,10,14,15].

Although advances in screening, early diagnosis and treatment have considerably prolonged breast cancer survival worldwide, the diagnosis is often made at an advanced stage in the Congo [16]. Breast cancer survival remains poorly explored in the Republic of Congo. At present, no data are available on the survival of patients undergoing treatment for breast cancer. It is in this context that we conducted this study. Our aim was to determine the survival of these patients, and to identify the the factors associated with it, in the oncology department of the Centre Hospitalier Universitaire de Brazzaville (CHUB).

Patients and Method

This was a monocentric, retrospective descriptive study conducted over a ten-year period, from January 1, 2011 to December 31, 2020, in the oncology department of the CHU of Brazzaville.

All patients with histologically confirmed breast cancer followed up in the CHUB oncology department from January 1, 2011 to December 31, 2020 were included in our study. Patients whose records did not include dates of diagnosis, treatment and follow-up were excluded. Sampling was exhaustive. Data were collected from medical records.

The variables studied were: age at diagnosis, gender, comorbidities, time between 1st symptoms and medical oncology consultation, general condition according to WHO score, histological type and molecular status, tumor size, lymph node involvement, presence of metastases, TNM classification and staging [17], type of treatment, response to treatment according to RECIST criteria [18], duration of follow-up and patient outcome.

As the study ended in December 2020, patients were considered alive, dead or lost to follow-up at that date.

A descriptive analysis of the study population was performed. Mean and standard deviations were calculated for quantitative

variables, and absolute and relative frequencies for qualitative variables. Survival curves were calculated using the Kaplan-Meier model. Statistical comparisons between survival curves were made using the Log-Rank model. Factors associated with survival were studied using the Cox model, and variables significantly associated with survival in univariate analysis were included in the multivariate model. The significance level was set at 5%. Data analysis was performed using epi info software version 7.2.2.6.

Results

During the study period, 534 breast cancers were registered in the CHUB oncology department; 354 met our inclusion criteria.

Epidemiological Aspects

The mean age at diagnosis was 47.25 ± 12.94 years, with extremes of 22 and 91 years. The 40-50 age group was the most represented, at 32.77% (Table I), with 348 women and 6 men.

Table I: distribution of patients according to age, general condition, tumor size, lymph node involvement and staging

Variables	Headcount	Percentage (%)
Age group		
[20 – 30]	14	3.95
[30 – 40]	95	26.84
[40 – 50]	116	32.77
[50 – 60]	67	18.93
[60 – 70]	36	10.17
[70 – 80]	21	5.93
[80 – 90]	4	1.13
[90 – 100]	1	0.28
General condition according to WHO		
0	37	10.45
1	63	17.80
2	50	14.12
3	136	38.42
4	68	19.21
Tumor size (T)		
T1	2	0.56
T2	32	9.04
T3	57	16.10
T4	263	74.29
Lymph nodes		
N0	76	21.47
N1	129	36.44

N2	122	34.46
N3	27	7.63
Staging		
Stage I	1	0.28
Stage II	42	11.86
Stage III	222	62.71
Stage IV	89	25.14

Clinical and Therapeutic Aspects

The average consultation time was 7.26 ± 9 months, with extremes ranging from 1 to 36 months. 47 patients had comorbidities, the most frequent being arterial hypertension (8.47%) and diabetes (1.98%). Forty-eight patients had a family history of cancer, including 37 with breast cancer and 11 with endometrial cancer; all were first-degree relatives.

Fifty-seven point sixty-three percent of patients had a WHO score of 3-4 (Table I). Cancer was bilateral in 4.52% of patients. Non-specific infiltrating carcinoma (CINOS) was the most frequently observed histological type (88.42%). 121 patients underwent immunohistochemistry, 51 were luminal B (RH and HER2 positive), 41 HER2 positive, 11 luminal A, and 18 triple negative. The mean tumor size was 8.60 cm ± 5.40 cm, with extremes of 1 and 15 cm. 74.29% of patients had stage T4 at diagnosis; 78.53% had lymph node involvement, and 25.14% were metastatic (Table I).

Chemotherapy was performed in 314 patients; surgery in 144 (radical in 100 patients, conservative in 11, and clean-up in 33). Hormone therapy was instituted in 62 patients; no patient received targeted therapy. Forty-seven patients received radiotherapy.

Treatment was evaluated according to RECIST criteria in 285 patients. 135 patients were in progression, 100 in complete remission, 24 in partial remission, and 26 in stabilization.

Progression and Factors Associated with Survival

Mean follow-up was 22.93 ± 23.21 months, with extremes of 1 and 168 months. At the end of our study, 46.61% of patients had died and 30.22% were lost to follow-up.

The overall survival rate at 3 and 5 years was 27% and 19%, with a median survival of 17 months (Figure 1).

In univariate analysis (Table II), patients aged over 35 (p = 0.004), good general condition (p = 0.03), absence of lymph node invasion (p = 0.006) (Figure 2); early clinical staging (p = 0.003) (figure 3), immunohistochemistry (0.000), specific treatment (p = 0.000) (figure 4), and short consultation time significantly prolonged survival.

In multivariate analysis, the risk of death increased with age (p = 0.018), absence of specific treatment (p = 0.000), failure to perform immunohistochemistry (p = 0.000), and long consultation time (p = 0.005) (Table III).

Table II: Univariate Analysis of Factors Associated with Survival

Variables	Hazard Ratio (95 % CI)	p-value
Years	074 (0.55 – 1)	0.04
≤ 35 years (74)		

> 35 years (280)		
WHO perfomance status	1.30 (1.02 – 1.65)	0.03
0-1-2 (150)		
3-4 (204)		
Metastases	1.50 (1.14 – 1.98)	0.003
Yes (89)		
No (265)		
Specific treatment	0.28 (0.19 –0.41)	0.000
Yes (322)		
No (32)		
Performed Immunohistochemistry	0.47 (0.36 – 0.63)	0.000
Yes (121)		
No (233)		
Consultation time	1.38 (1.08 – 1.78)	0.010
≤ 5 months (243)		
> 5 months (111)		

Table III: Multivariate Analysis of Factors Associated with Survival

Variables	Hazard Ratio (95 % CI)	p-value
Age	0.6906 (0.5077 – 0.9393)	0.0183
Specific treatment	0.2848 (0.1931 – 0.4201)	0.0000
Performed immunohistochemistry	0.5076 (0.3836 – 0.6717)	0.0000
Consultation time	1.4262 (1.1081 – 1.8356)	0.0058

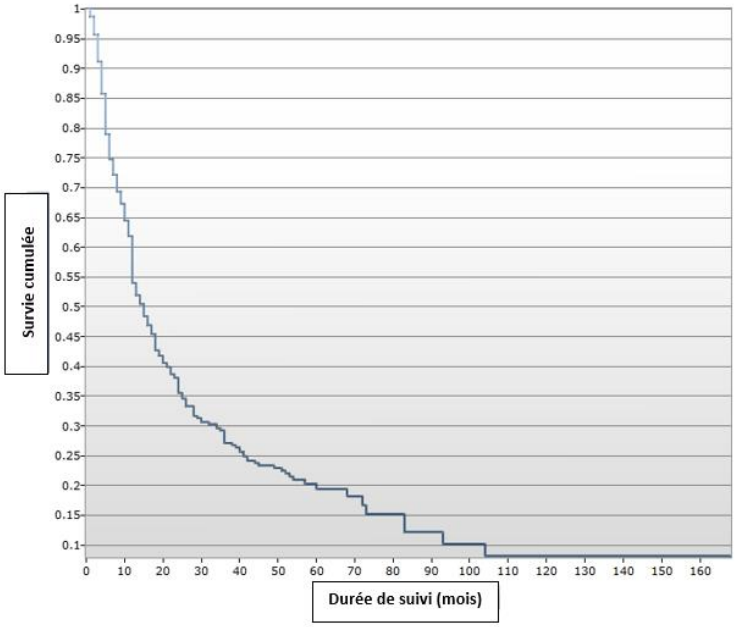

Figure 1: Overall Survival Curve

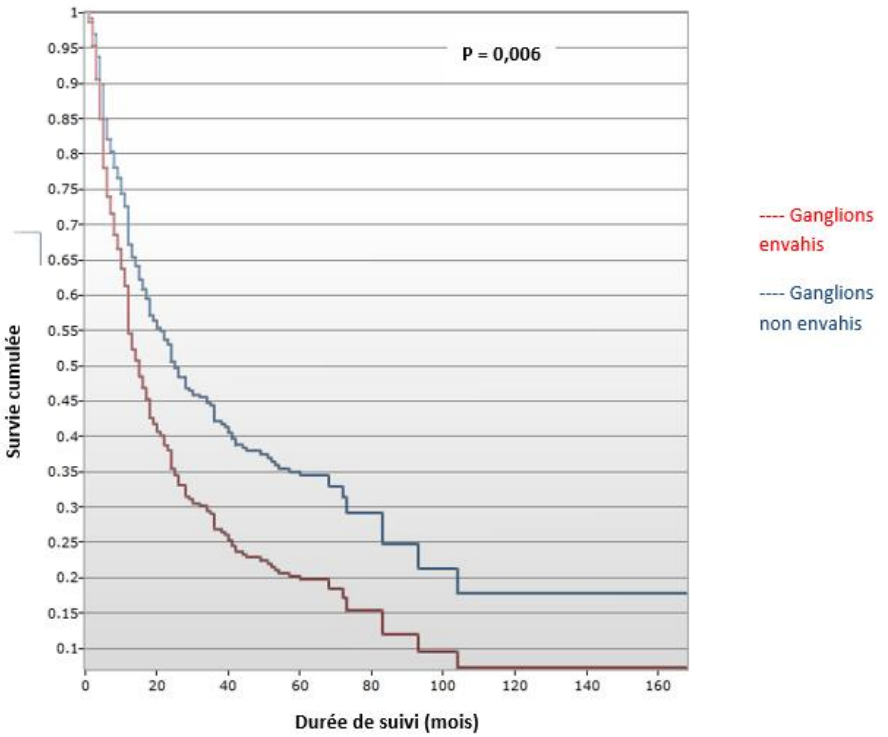

Figure 2: Survival Curve According to Lymph Node Involvement

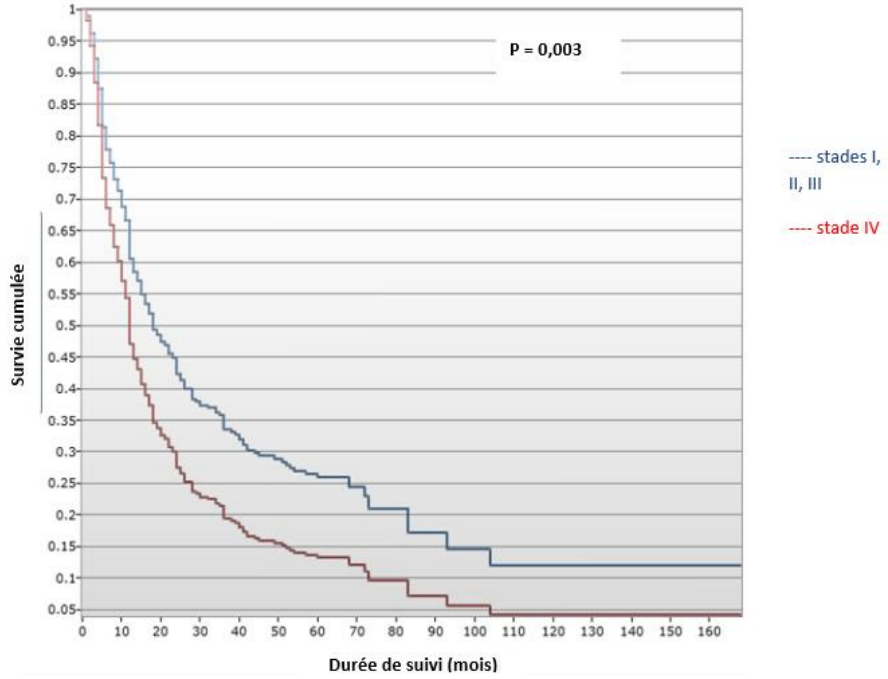

Figure 3: Survival Curve by Stage

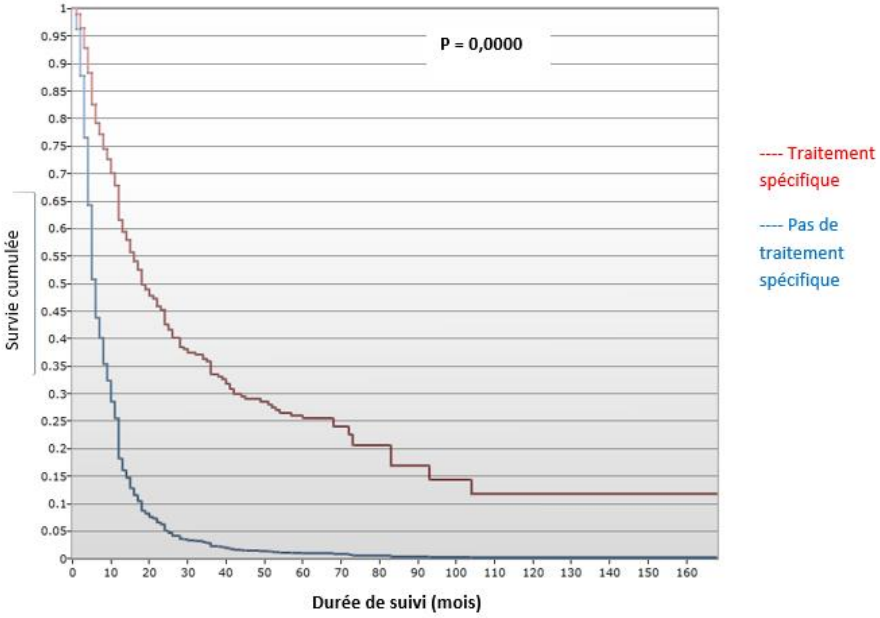

Figure 4: Survival Curve by Treatment

Discussion

Our study had limitations due to its retrospective nature. Due to limited financial resources, some patients did not undergo adequate extension work-up and immunohistochemistry. Prospective, multicentric studies are therefore needed to overcome these limitations.

The average age of patients at diagnosis was 47.25 years; breast cancer is diagnosed at a younger age in Africa than in Western countries [19-21]. In Cameroon, Atangana et al [19] noted an average age at diagnosis of 45 years, while in Morocco, Mrabti et al [22] reported an average age of 49 years. In France, on the other hand, Bertaud et al. found a higher age of onset of 64.7 years [23].

CINOS was the most frequent histological type (88.42%). Our results corroborate those of the literature, which indicate a predominance of CINOS, with rates ranging from 77.1% to 94.7%. This high proportion of CINOS can be explained by the fact that tumours most often develop from the epithelium of the milk ducts [19, 21, 24, 25].

The mean tumour size was 8.60 cm. This finding may be explained by a delay in diagnosis attributable to patients lack of financial resources, ignorance and denial of the disease, and the absence of screening programs in our context.

Median survival was 17 months, suggesting that half of our study population had died by 17 months. Overall survival rates at 3 and 5 years were 27% and 19%. These relatively low survival rates differ from those reported in the literature. Bennani et al. in Morocco reported in 2015 an overall survival rate at 3 and 5 years of 52.69% and 40% [11]. Gnangnon et al in Benin reported a 5-year overall survival rate of 59.22% in 2021 [13]. In Cameroon in 2023, Mapoko et al. described a median survival of 83.65 months and an overall survival rate at 3 years of 65.11% and 58.60% at 5 years. Kawai et al in Japan in 2014 [8], Cowppli-Bony et al. in 2016 [9], reported a 5-year overall survival rate of 88%. In the USA, Plichta et al. reported a 5-year overall survival rate of 93% in 2016 [7]. These differences in survival rates observed between Africa and other regions could be explained by several factors. Diagnosis is generally made at an advanced stage due to financial, geographical and therapeutic inaccessibility. The presence of more advanced screening programs and diagnostic and treatment infrastructures in countries with a high human

development index.

In univariate analysis, patients aged 35 or over, impaired general condition and the presence of metastases were associated with lower survival. However, a delay in consultation of less than 5 months, the performance of immunohistochemistry and specific treatment were associated with prolonged survival in multivariate analysis. Breast cancer in younger women tends to have more aggressive features than in older women. It is often associated with late diagnosis, aggressive biology, high risk of relapse and poor survival. Young age is an independent predictor of poor prognosis [26]. These results are similar to those found in Cameroon in 2023 [14] and South Africa in 2018 [12], where early diagnosis was significantly associated with improved survival. The risk of death increased for metastatic patients in Uganda [27]. These studies showed that early-stage disease benefited from improved survival thanks to the use of different therapeutic modalities. On the other hand, a decline in survival was associated with advanced stages and deterioration in general condition. Immunohistochemistry enables us to refine the therapeutic plan by selecting the most appropriate means for each patient. Surgery, chemotherapy, hormone therapy, targeted therapies, immunotherapy and radiotherapy are proving indispensable in improving breast cancer survival.

Conclusion

The incidence of breast cancer is increasing worldwide. At the end of our study, breast cancer survival was low, 27% at 3 years, and 19% at 5 years. Younger age, poorer general health and longer consultation times were associated with poorer survival. Early staging, immunohistochemistry and specific treatment prolonged survival. The absence of a screening program in our country plays an important role in the way this cancer manifests itself clinically. It is therefore essential to develop a screening strategy aimed at improving awareness and early detection, leading to more effective management and better outcomes.

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