Scientific Research Publishing

Open Journal of Obstetrics and Gynecology, 2025, 15(3), 408-422
https://www.scirp.org/journal/ojog
ISSN Online: 2160-8806
ISSN Print: 2160-8792

Management of Breast Cancer in a Resource-Limited Semi-Urban Setting: A Series of 155 Cases Treated in Garoua, Cameroon

Félix Essiben[1*], Inna Rakya[2], Aoudi Mbarjuk[2], Kévina Justine Ngah Atangana[2], Etienne Belinga[1], Julius Dohbit Sama[1], Claude Noa Ndoua[1]

[1]Department of Obstetrics and Gynecology, Faculty of Medicine and Biomedical Sciences (FMBS), University of Yaoundé I (UYI), Yaoundé, Cameroon
[2]Department of Obstetrics and Gynecology, Faculty of Medicine and Biomedical Sciences (FMBS), University of Garoua (UG), Garoua, Cameroon
Email: *fessiben@gmail.com

How to cite this paper: Essiben, F., Rakya, I., Mbarjuk, A., Ngah Atangana, K.J., Belinga, E., Dohbit Sama, J. and Noa Ndoua, C. (2025) Management of Breast Cancer in a Resource-Limited Semi-Urban Setting: A Series of 155 Cases Treated in Garoua, Cameroon. *Open Journal of Obstetrics and Gynecology*, **15**, 408-422.
https://doi.org/10.4236/ojog.2025.153036

Received: January 28, 2025
Accepted: March 17, 2025
Published: March 20, 2025

Abstract

Introduction: Breast cancer is a public health problem in Cameroon because of its high frequency and lethality rates. Diagnosis and treatment can be problematic in settings that are very limited in resources such as the northern region of Cameroon. We wanted to investigate on breast cancer management in Garoua. **Objective:** This paper aims to study the epidemiological and management aspects of breast cancer in Garoua. **Material and Methods:** This was a descriptive cross-sectional study in 4 hospitals in Garoua from November 2023 to May 15, 2024. We included patients treated for breast cancer over 6 years, between January 2018 and April 2024. We collected their sociodemographic, clinical, therapeutic and prognostic data. Data analysis was carried out using EPI data and Microsoft Excel 2013 softwares. **Results:** Out of 20,475 gynecology consultations, we identified 176 cases of patients treated for breast cancer, giving a frequency of 0.86%. Of the 155 patients selected for the study, 98.1% were women. The median age was 45 years (range 15 to 70 years). Most patients were married (78.7%) and had a primary education level (69.7%). Family history of breast cancer was reported in 9% of cases. Breast swelling was the most common symptom (81.3%). Only 55.5% of cases had a mammogram and/or ultrasound performed, and most lesions were classified as ACR4 (60.5%). At the time of diagnosis, 70.7% of patients were at stage T4 or T3 and 85.8% had axillary lymphadenopathy. Chemotherapy was the main therapeutic modality used (83.7%). Survival at 2 years was 51.5% with 15.6% lost to

follow-up. **Conclusion:** Breast cancer is often encountered in Garoua. Difficulties in diagnosis and treatment compromise the prognosis of patients.

Keywords

Breast Cancer, Limited Resources, Management, Prognosis, Garoua

1. Introduction

Breast cancer represents a global health burden as it is the most common form of cancer in women worldwide [1]. According to projections, it will remain so and its incidence will even increase significantly with 35 million cases expected in 2050. Its incidence and lethality are the highest in the world, ahead of lung cancer. Alone, it accounted for 23.8% of all new cases of cancer in women and 15.4% of all cancer deaths worldwide in 2022 [2].

In sub-Saharan Africa, breast cancer is a major public health problem because it ranks first, in 28 countries, compared to 19 countries for cervical cancer [3]. In Cameroon, breast cancer is the leading cancer in women with 4207 new cases and 2285 deaths in 2022 [4].

Cancer-related mortality is higher in Africa than everywhere else, although its incidence is higher everywhere else than in Africa [1] [5]. Currently in Cameroon, 5-year survival varies from 50 to 60% depending on the study [6]-[8] compared to about 90% in developed countries [9]. These disparities between countries can also be observed between regions of the same country. The reasons for this essentially lie in accessibility to effective care. Indeed, it has been established that early and adequate treatment improves the prognosis.

The prognostic factors that have a lasting influence on patient survival include the clinical stage at the time of diagnosis, the type of cancer and, most importantly, the quality of care [10]. Early diagnosis, availability of diagnostic means and accessibility to the most effective therapeutic means are sorely lacking in low-income countries. Many studies in Africa have shown that most women are diagnosed at an advanced stage of the disease [6]-[8] [10]. Molecular diagnosis of breast cancer is not often accessible. In Cameroon, Essiben *et al.* found in 2017 that only 6.3% had performed an immunohistochemistry [11] although this rate is clearly increasing to 34% in Yaoundé according to Ngo Um *et al.* in 2022 [8].

The published data at our disposal essentially describe the care received in urban areas where the majority of the few available resources are concentrated. We did not find any study on the management of breast cancer in Garoua. The aim of this study is to describe the care and results in an environment where access to care is very difficult. This would help ensure that these populations have the opportunity to prevent, detect, treat and survive breast cancer because it will make it easier to identify potential priority areas for intervention and help prioritize efforts.

2. Methodology

2.1. Study Design and Setting

This was a descriptive cross-sectional study with retrospective and prospective components. The study was carried out for 7 months, from November 2023 to May 2024. It concerned the files of patients treated for breast cancer over a period of 6 years from January 2018 to April 2024.

The study was conducted in obstetrics and gynecology services, anatomy and pathology, and imaging departments of five hospitals in the town of Garoua, capital of the northern region of Cameroon which has approximately 2.3 million inhabitants and is located 950 km from Yaoundé, the country's capital. The five facilities included the General Hospital of Garoua, the Regional Hospital of Garoua, the Regional Hospital Center of Garoua, the Military Hospital of Garoua and the Notre Dame des Apôtres Hospital of Djamboutou of Garoua.

2.2. Study Population

We recruited patients treated for breast cancer by identifying them among those who came for consultation for breast diseases. We excluded incomplete files or patients unreachable by telephone. This was an exhaustive non-probability sampling. For each patient recruited, a code comprising the first 2 letters of his name and the concerned hospital was assigned to him in order to avoid duplicates. We studied socio-demographic characteristics (sex, age, profession, marital status, level of education), clinical characteristics (reason for consultation, obstetric and gynecological, medical, toxicological, and family history, clinical presentation, paraclinical characteristics (mammographic, ultrasonographic, histological and molecular) and aspects of management (treatments administered and prognosis).

The data were collected using pre-established and pre-tested information sheets from the consultation registers of the following department: obstetrics-gynecology, anatomy and pathology, and oncology in the retrospective part of the study.

We also used medical records of patients hospitalized in the obstetrics-gynecology and oncology departments, digital consultation files of the gynecology secretariats and death registers.

In the prospective part, we called each patient whose telephone contact details were available in medical documents in order to assess their progress and complete any other information lacking in the patient medical file.

2.3. Data Management and Statistical Analysis

The data collected were analyzed using IBM EpiData software. Qualitative variables were expressed in frequencies and percentages. Quantitative variables were expressed as median with range. The prevalence of breast cancer was calculated using the number of cases of breast cancer divided by the number of consultations in obstetrics and gynecology services.

2.4. Ethical Considerations

We obtained ethical clearance from the Northern Region Ethics Committee for Human Health Research, and administrative authorizations from the heads of the various hospitals. The information has been processed in accordance with ethical principles.

3. Results

We identified a total of 20,475 consultations, of which 176 women were treated for breast cancer. Thus, the overall prevalence of breast cancer was 0.86% in Garoua. We included 155 patients for the study, after excluding 21 files for incomplete information.

3.1. Sociodemographic Data

Table 1 represents the sociodemographic characteristics of the patients. The ages ranged between 15 and 70 years. The median age was 45 years. Most patients were in the age group of 35 to 45 years (29.7%). Patients under 50 years old represented 40% of our sample at diagnosis. Most patients were female (98.1%). Majority of breast cancer patients lived in urban areas (76.1%) and were married (78.7%). Housewives were most represented (59.4%).

Table 1. Sociodemographic characteristics of patients (N = 155).

Variables	Frequency (n)	Percentage (%)
Sex		
Male	3	1.7
Female	173	98.3
Age		
[15 - 25]	6	3.9
[25 - 35]	24	15.5
[35 - 45]	46	29.7
[45 - 55]	41	26.6
≥ 55	38	24.5
Residence		
Rural	37	23.9
Urbain	118	76.1
Profession		
Civil servant	27	17.4
Student	1	0.6
Trader	9	5.8
Farmer	15	9.7
Housewife	92	59.4

Continued

Retired	2	1.3
Private sector	9	5.8
Marital status		
Single	17	11
Married	121	78
Widow	17	11
Educational level		
None	45	29
Primary	62	40
Secondary	32	20.7
Superior	16	10.3

3.2. Clinical Data

3.2.1. Personal History of Patients

Table 2 presents personal history of the patients. Regarding gynecological history, median age at menarche was 13 years with range between 9 and 19 years. The median age at menopause was 50 years with range between 37 and 61 years, with only 23.2% menopausal women. Regarding hormone use, 22.6% and 7.1% of patients had been on oral contraceptives and Hormponal replacement therapy. We noted only one case of a personal history of breast cancer.

Regarding the obstetrical history, the minimum age at first pregnancy was 12 years and maximum age 35 years with a median of 21 years. Most women were pauciparous (45.4%). Women who had breastfed were in the majority at 71.61% of cases.

Concerning lifestyle habits, 20% of patients consumed alcohol while 75.5% did not practice physical activity. Overweight or obese women represented 11% and 13.5% of our study population, respectively.

Table 2. Personal history of patients (N = 155).

Variable	Frequency (n)	Percentage (%)
Menarche (years)		
[9 - 12]	54	35.5
[13 - 16]	93	61.2
>16	5	3.3
Menopause		
Yes	36	23.2
No	119	76.8
Age at menopause (years)		
< 40	3	7.7

Continued

[40 - 55]	26	66.7
> 55	10	25.6
Oral contraceptives		
Yes	35	22.6
No	120	77.4
Hormonal replacement therapy		
Yes	11	7.1
No	144	92.9
Personal history of cancer		
Yes	1	0.7
No	154	99.3
Parity (P)		
P > 5	25	16.4
P4-5	20	13.2
P2-3	69	45.4
P1	18	11.8
P0	20	13.2
Age at first pregnancy (years)		
≤19	78	56.1
[20 - 29]	58	41.7
>29	3	2.2
Breastfeeding		
Yes	111	71.6
No	44	28.4
Alcohol		
Yes	31	20
No	124	80
Physical activity		
Yes	38	24.5
No	117	75.5
IMC		
Skinny	7	4.5
Normal	22	14.2
Overweight	17	11.0
Obese	21	13.5
Undetermined	88	56.8

3.2.2. Family History of Patients

Table 3 presents the patients' family history of cancer. We noted that 8.4% of patients had cancer in their family, i.e. 6.5% in ancestors and 0.6% in siblings. Likewise, breast cancer was most frequently found in the history (4.5%) while ovarian occurred in 0.6% of cases.

Table 3. Family history of patients (N = 155).

Variable	Frequency (n)	Percentage (%)
Familial history of cancer		
No	142	91.6
Yes	13	8.4
Ascendants		
No	145	93.5
Yes	10	6.5
Siblings		
No	154	99.4
Yes	1	0.6
History of breast cancer		
No	148	95.5
Yes	7	4.5
History of ovarian cancer		
No	154	99.4
Yes	1	0.6

3.3. Presenting Complaints

Figure 1 shows the distribution of reasons for consultation. Breast swelling (81.3%) and lump sensation (32.3%) are the most common symptoms.

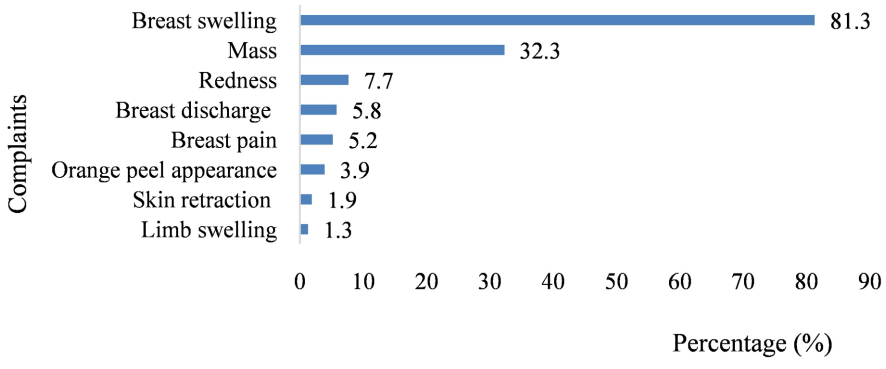

Figure 1. Distribution of patients according to presenting complaints of patients (N = 155).

3.4. Clinical Characteristics of Tumors

Table 4 shows the clinical characteristics of the tumors. The left breast was the

most affected (63.9%) with 2% of patients having bilateral involvement. We noted a predominance of involvement of the upper outer quadrant (60.6%). The majority of cases were clinical stage T3 (40%) and 57.6% of lymph node involvement was stage N2. Most cases were classified Mx (76.8%), indicating a lack of information on distant metastases.

Table 4. Description and mapping of lesions (N = 155).

Variable	Frequency (n)	Percentage (%)
Affected breast		
Left	99	63.9
Right	53	34.2
Bilateral	3	1.9
Localisation		
Upper outer quadrant	94	60.6
Upper Inner quadrant	34	21.9
Outer lower quadrant	17	11.0
Inner lower quadrant	6	3.9
Areola	4	2.6
Size		
T1	5	3.2
T2	41	26.5
T3	62	40
T4	41	26.5
T0	2	1.3
Tx	4	2.6
Lymph node involvement		
N1	32	20.6
N2	87	56.1
N3	23	14.8
N0	9	5.8
NX	4	2.6
Metastases		
M0	17	11.3
M1	18	11.9
MX	120	76.8

3.5. Paraclinical Data

Table 5 shows the paraclinical data of patients. Among 155 patients, only 86 (55.5%) had performed a mammogram/breast ultrasound and 14 (9%) did not

perform a histological examination and only 1.9% had performed immunohistochemistry.

Most mammographic lesions were ACR 4 (60.5%) and ACR 3 (22.1%). The predominant histological type was infiltrating ductal carcinoma, i.e. 90.8%.

Table 5. Paraclinical data.

Variable	Frequency (n)	Percentage (%)
Radiologic classification		
ACR 1	2	2.3
ACR 2	3	3.5
ACR 3	19	22.1
ACR 4	52	60.5
ACR 5	10	11.6
Histological examination done		
No	141	91
Yes	14	9
Histologic type		
Invasive ductal carcinoma	128	90.8
Ductal carcinoma in situ	6	4.3
Invasive lobular carcinoma	2	1.4
Lobular carcinoma in situ	3	2.1
Not specified	2	1.4

ACR: American College of Radiology.

3.6. Therapeutic Data

Figure 2 shows the therapeutic modalities used in patients. Chemotherapy was used in 83.7% of patients, followed by surgery in 57.1% of patients. The use of radiotherapy was marginal, i.e. 5.5% of cases.

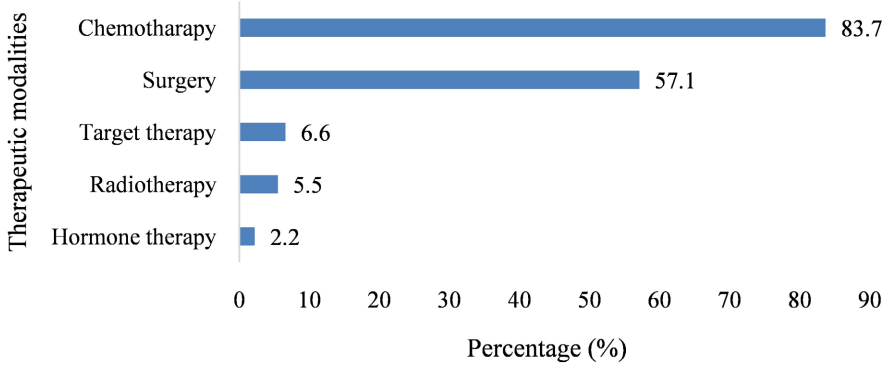

Figure 2. Distribution of patients according to therapeutic modalities (N = 155).

3.7. Prognostic Data

Table 6 and Figure 3 show patient prognosis data. Of the 155 cases of breast can-

cer studied, we documented the evolution of 122 cases (78.7%). The case fatality rate was 40.3%. Overall survival at 2 years in our study population was 51.5% and 20.3% at 5 years. We found a remission rate of 5.8% and a relapse-free survival of 9.7%.

Table 6. Distribution of patients according to prognosis (N = 155).

Prognosis	Frequency (n)	Percentage (%)
Remission	9	5.8
Relapse-free survival	15	9.7
Survival with relapse	44	28.6
Death	62	40.3
Loss to follow-up	24	15.6

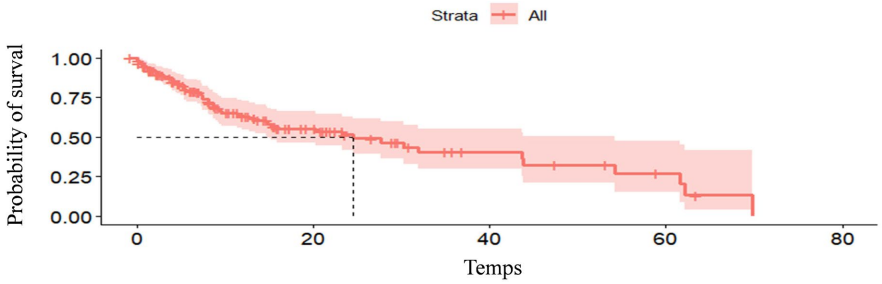

Figure 3. Patient survival curve (N = 122).

4. Discussion

4.1. Breast Cancer Frequency

The overall prevalence of breast cancer was 0.86%. It was much higher than the figure reported by Engbang *et al.* in 2015, following a multicenter study in Cameroon, which stood at 0.3 per 1000 [9]. Indeed, some patients in our study (9%) were treated for cancer without histological confirmation. However, the small proportion of patients concerned cannot explain such a difference in frequency.

4.2. Sociodemographic Aspects

The median age of patients was 45 years and 40% of patients were younger than 50 years. Several authors in the literature found a significant proportion of patients who are less than 50 years old, up to 70% in certain African series [6] [12]-[14]. This is not the case in developed countries where breast cancer is often described in older women [9].

Most patients in the study were female (98.1%), which is consistent with the literature [15] [16]. In the North region of Cameroon, women marry very young, have many children and breastfeed (71.6%). Breastfeeding awareness is a national policy to combat malnutrition and other childhood conditions. This explains why women with breast cancer have often breastfed [6] [7] [11] without implying that

multiparity or breastfeeding be considered as risk factors for the disease. Women in this region have a low socio-economic level and have less formal education. They have little knowledge about breast cancer, hence the frequent discovery of the disease at an advanced stage (66.5%). The absence of systematic screening and poor access to quality care do not contribute to improving early diagnosis.

4.3. Clinical Aspects

The clinical profile of patients in our study was not different from what is described in the literature. The average age at menarche was 13 years. Other authors have had similar results. Early menarche is a risk factor for breast cancer [1]. The same is true of late menopause [17]. However, local studies show that most women with cancer are not postmenopausal [6]-[8] [11] [12]. We have found the same results because only 23.2% of women had reached menopause, of which 25.6% had a late menopause. The onset of menopause after age 50 constitutes an increased risk of breast cancer and is associated with an increased risk of 3% per additional year of menstruation [18].

Due to early marriages, the age at first pregnancy is young. Late pregnancies are therefore rare, 2.2% in our sample. The risk of developing breast cancer is higher for women with late first pregnancies compared to women who had their first pregnancy before the age of 25 [18]. Cancer risk factors linked to lifestyle were not common in our study population. Very few women were overweight or obese; 11% and 13.5%, respectively. Other authors had found larger proportions between 20 and 40% in our environment and elsewhere [16] [19]. This is partly due to a lower prevalence of obesity outside large cities. Garoua and its surrounding settlements are still poorly influenced by modernity.

In our series, patients with a family history of breast cancer represented 9.03%. Other local series found slightly low and higher proportions of 12 to 13% [6] [8].

4.4. Clinical Data

The left breast is the most often affected by breast cancer, according to numerous studies [6] [11] [20]. We found a similar result. Swelling is the most common symptom when cancer is discovered at an advanced stage, and this was the case in this study (81.3%). An advanced stage of the disease was found in most patients (68.2%), whether locally or regionally, as is often the case in our environment [6]-[8] [11] [13] [16] [20] [21]. In addition to access to care and little knowledge about the disease, recourse to biomedicine is often late. According to Essiben *et al.* in 2022, only 64% of patients resort to biomedicine as first intention in urban areas [22].

4.5. Paraclinical Aspects

The diagnosis of breast cancer is difficult in Garoua. We found that only 55% of patients were able to perform a mammogram or ultrasound. Lack of financial means and unavailability of a functional mammographic machine could explain

this result. Furthermore, carrying out a histological examination immediately in the event of clinical suspicion would reduce treatment costs, although this is not an optimal treatment approach. The interpretation of the mammograms/ultrasound scans performed shows a predominance of lesions that are initially suspicious. According to a study by Guegang *et al.* in Yaoundé, most mammograms done in the face of clinical suspicion reveal advanced stages [23]. We observed that 9% of patients were treated for breast cancer without histological proof. The unavailability of the lone pathologist in the city and the high cost of carrying out a histological examination outside the city could justify this attitude in the face of a locally very advanced disease.

Invasive ductal carcinoma is the histological type that was most often encountered, as is the case with other studies done in the country [12] [15] [16] [20] [21]. Access to molecular diagnosis is poor. Only 1.9% of patients performed immunohistochemistry in our study. The test cannot be performed locally. Even in Yaounde, only 6.3% of patients performed it in 2017 [11]. However, many authors report a higher availability of molecular diagnosis in recent years with performance proportions between 16 and 34% [8] [16]. This compromises therapeutic choices.

4.6. Therapeutic Aspects

The rate of treatment initiation for patients in our study was low, that is 62.1% against 82.8% reported by Ngo Um *et al.* in 2022 in Yaounde [8]. Access to care is strongly influenced by the geographic and financial accessibility of health structures, the use of traditional medicine and cultural beliefs. Treatment data reveal that chemotherapy is the most prescribed treatment because 83.7% of patients received it. The reasons for this are the presence of human resources that can administer the treatment and state subsidization of basic anticancer regimens for which costs are reduced. This is not the case with surgery, which requires expertise, and even less so, for radiotherapy which cannot be carried out in the locality due to lack of appropriate services. Surgery and radiotherapy were used in 57.1% and 5.5% of patients, respectively. For radiotherapy, patients must travel at least 950 km. These therapeutic options were only used for 57.1% and 5.5% of patients, respectively, for surgery and radiotherapy.

4.7. Prognostic Aspects

The diagnostic and therapeutic management of patients had a direct influence on the outcome. In Africa, in general, due to the limited diagnostic and therapeutic resources, patient survival is low, with 5-year survival close to 50% [10] [24]-[26]. In Cameroon, the global 5-year survival between 2004 and 2015 was between 43 and 51% [10] [11]. This is low compared to figures reported in industrialized countries where 5-year survival figures are about 80% (26%). In our study 2-year survival was only 51.5% as opposed to 79.4% reported by Noa *et al.* in 2022 for women operated for breast cancer [7].

5. Limitations of the Study

Our results may have been somewhat altered during the collection of information. The quality of record keeping and patient recollection during telephone communications may have biased the quality of the data collected.

6. Conclusion

At the end of our study, it was observed that breast cancer is common in Garoua. We also observed a real loss of opportunities for patients in Garoua, throughout the care process, from diagnosis to treatment. This results in a poor prognosis, hence the need to provide this town with human and material resources that are essential to improving the survival of breast cancer in Garoua.

Authors' Contributions

All authors participated intellectually in the conception, preparation and revision of the manuscript before its submission and during revision process.

Conflicts of Interest

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

References

[1] WHO. Breast Cancer. https://www.who.int/fr/news-room/fact-sheets/detail/breast-cancer

[2] Filho, A.M., Laversanne, M., Ferlay, J., Colombet, M., Piñeros, M., Znaor, A., *et al.* (2024) The Globocan 2022 Cancer Estimates: Data Sources, Methods, and a Snapshot of the Cancer Burden Worldwide. *International Journal of Cancer*, **156**, 1336-1346. https://doi.org/10.1002/ijc.35278

[3] UN Info. World News a Human Perspective. Sub-Saharan Africa: Cancer burden Expected to Almost Double in Next 20 Years. https://news.un.org/fr/story/2022/05/1119792

[4] Ferlay, J., Ervik, M., Lam, F., Laversanne, M., Colombet, M., Mery, L., Piñeros, M., Znaor, A., Soerjomataram, I. and Bray, F. (2024) Global Cancer Observatory: Cancer Today. International Agency for Research on Cancer. https://gco.iarc.who.int/today

[5] Sancho-Garnier, H. and Colonna, M. (2019) Épidémiologie des cancers du sein. *La Presse Médicale*, **48**, 1076-1084. https://doi.org/10.1016/j.lpm.2019.09.022

[6] Essiben, F., Foumane, P., Mboudou, *et al.* (2013) Diagnostic et traitement du cancer du sein au Cameroun: Une série de 65 cas. *Le Mali Medical*, **28**, 1-5.

[7] Ndoua, C.C.N., Motolouze, K., Etienne, A., *et al.* (2022) Survival of Patients Operated on for Breast Cancer in Yaounde: A Study of 166 Cases. *Health Sciences and Disease*, **23**, 27-30.

[8] Ngo, U.E.M., Ntsama, J.A.M., Motolouze, K., Schouame, N.M.L.N., Atenguena, O.E., Ndoua, C.C.N., *et al.* (2024) Determinants of Early Survival of Breast Cancer Patients in Yaoundé-Cameroon. *Open Journal of Obstetrics and Gynecology*, **14**, 487-501. https://doi.org/10.4236/ojog.2024.143042

[9] INCA. https://www.e-cancer.fr/Patients-et-proches/Les-cancers/Cancer-du-sein/Quelques-chiffres

[10] Gnangnon, F.H.R., Parenté, A., Aboubakar, M., Kiki-migan, Y., Totah, T., Gbessi, D.G., *et al.* (2024) Prognostic Factors and Overall Survival of Breast Cancer in Benin: A Hospital-Based Study. *BMC Women's Health*, **24**, Article No. 295. https://doi.org/10.1186/s12905-024-03114-y

[11] Essiben, F., Foumane, P., Meka, E.J., Tchakounté, M., Dohbit, J.S., Nsahlai, C., *et al.* (2017) Descriptive Analysis of 192 Cases of Breast Cancer Occurring before Age 40 in Yaounde, Cameroon. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, **6**, 2704-2710. https://doi.org/10.18203/2320-1770.ijrcog20172898

[12] Ndamba, J.P., Essome, H., Koh, V.M., Simo, G., Sime, J.D., Mouelle, A.S., *et al.* (2015) Cancer du sein au Cameroun, profil histo-épidémiologique: à propos de 3044 cas. *Pan African Medical Journal*, **21**, Article No. 242. https://doi.org/10.11604/pamj.2015.21.242.7269

[13] Belley Priso E, Nguemgue C., Nana Njamen T., *et al.*, (2010) Epidemiological and Clinical Profile of Breast Pathology at the Douala General Hospital (Cameroun). *Health Sciences and Diseases*, **11**. https://www.hsd-fmsb.org/index.php/hsd/article/view/38/pdf_89

[14] Zaki, H.M., Garba-Bouda, O., Garba, S.M. and Nouhou, H. (2013) Profil épidémiologique et anatomopathologique du cancer du sein au Niger. *African Journal of Cancer*, **5**, 185-191. https://doi.org/10.1007/s12558-013-0274-9

[15] Zingue, S., Atenguena, E.O., Zingue, L.L., Tueche, A.B., Njamen, D., Nkoum, A.B., *et al.* (2021) Epidemiological and Clinical Profile, and Survival of Patients Followed for Breast Cancer between 2010 and 2015 at the Yaounde General Hospital, Cameroon. *Pan African Medical Journal*, **39**, Article No. 182. https://doi.org/10.11604/pamj.2021.39.182.26866

[16] Mapoko, E., Atenguena, E., Mbassi, B., *et al.* (2023) Profil épidémiologique, clinique et thérapeutique des patients suivis pour cancer du sein dans une unité d'oncologie médicale de référence majeure du Cameroun: Étude transversale. *Pan African Medical Journal*, **44**, 4.

[17] Frikha, N. and Chlif, M. (2021) Un aperçu des facteurs de risque du cancer du sein. *Bulletin de l'Académie Nationale de Médecine*, **205**, 519-527. https://doi.org/10.1016/j.banm.2020.10.018

[18] Collaborative Group on Hormonal Factors in Breast Cancer (1997) Breast Cancer and Hormonal Replacement Therapy: Collaborative Reanalysis of Individual Data from 51 Epidemiological Studies of 52,705 Women with Breast Cancer and 108,411 Women without Breast Cancer. *The Lancet*, **350**, 1047-1059.

[19] Togo, A., Traoré, A., Traoré, C., Dembélé, B.T., Kanté, L., Diakité, I., *et al.* (2010) Cancer du sein dans deux centres hospitaliers de Bamako (Mali): Aspects diagnostiques et thérapeutiques. *African Journal of Cancer*, **2**, 88-91. https://doi.org/10.1007/s12558-010-0060-x

[20] Motolouze, K., Ndoua, C.C.N., Okobalemba, E.A., *et al.* (2023) Clinical, Paraclinical and Therapeutic Profile of Patients Operated on for Breast Cancer at the Yaounde Gynae-Co-Obstetric and Pediatric Hospital. *Pan African Medical Journal*, **44**, 2.

[21] Kemfang Ngowa, J.D., Ebune, J.L., Ngassam, A., Atangana, J., Kabeyene, A. and Kasia, J.M. (2015) Clinicohistopathological Features and Molecular Markers of Breast Cancer in a Group of Patients at the Yaoundé General Hospital-Cameroon. *African Journal of Cancer*, **7**, 108-112. https://doi.org/10.1007/s12558-015-0380-y

[22] Félix, E., Elisabeth, M., Véronique, B., *et al.* (2022) Therapeutic Routes for Women

with Breast Cancer in Two University Hospitals in Yaoundé. *Health Sciences and Diseases*, **23**, 114-121.

[23] Guegang, E., Moifo, B., *et al.* (2011) Contribution of Mammography and Anatomopathology in Breast Tumor Lesions during a Mass Screening and Diagnostic Campaign in Yaoundé (Cameroon)]. *Journal Africain d'Imagerie Médicale*, **4**, 345-414.

[24] Sankaranarayanan, R., Swaminathan, R., Jayant, K. and Brenner, H. (2011) An Overview of Cancer Survival in Africa, Asia, the Caribbean and Central America: The Case for Investment in Cancer health services. *IARC Scientific Publications*, **162**, 257-291.

[25] Galukande, M., Wabinga, H. and Mirembe, F. (2015) Breast Cancer Survival Experiences at a Tertiary Hospital in Sub-Saharan Africa: A Cohort Study. *World Journal of Surgical Oncology*, **13**, Article No. 220. https://doi.org/10.1186/s12957-015-0632-4

[26] Colzani, E., Liljegren, A., Johansson, A.L.V., Adolfsson, J., Hellborg, H., Hall, P.F.L., *et al.* (2011) Prognosis of Patients with Breast Cancer: Causes of Death and Effects of Time since Diagnosis, Age, and Tumor Characteristics. *Journal of Clinical Oncology*, **29**, 4014-4021. https://doi.org/10.1200/jco.2010.32.6462