Breast Cancer Survival in Cameroon: Analysis of a Cohort of 404 Patients at the Yaoundé General Hospital

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Abstract

This study aimed to estimate the survival rate of breast cancer in a group of patients followed up at the Yaoundé General Hospital in Cameroon. A retrospective review of records of patients managed for breast cancer between 1995 and 2007 was carried out at the Yaoundé General Hospital. Survival analysis was carried out with survival defined as the time between the date of unequivocal diagnosis of cancer and the date of last follow-up or death. Survival curves were plotted in R.3.1.1 software. Mean age of the patients was 47.5 ± 12.36 years. Most of the patients (67.9%) presented with advanced breast cancer disease (stage III and IV). Overall patient survival rate was 30% at 5 years and 13.2% at 10 years. Median overall survival time was 2 (1.9 - 3) years. There was a correlation between survival and the stage of disease. The highest survival rates were recorded in stages I and II while the lowest rates were recorded in stage IV. There was no statistically significant difference in survival among the age groups (p = 0.15). Overall survival rates of breast cancer are 30% at 5 years and 13.2% at 10 years among Cameroonian patients and are lower compared with 90% and 82% respectively at 5 years and 10 years in some developed countries.

Keywords

Survival, Breast Cancer, Developing Countries

1. Introduction

Breast cancer is now the most frequent cancer of women worldwide with up to a million cases occurring annually [1]. In Cameroon, according to the Globocan 2010 estimation, breast cancer is the most frequent cancer in women before cervical cancer with an incidence of 27.9 per 100,000 women [2].

Lifestyle changes associated with urbanization and the concomitant loss of traditional protective factors appear to be associated with the rising incidence of breast cancer in African women [3] [4].

Although more than half of all new cases of breast cancer are diagnosed in the industrialized world (*i.e.* North America excluding Mexico and Western Europe), more than three quarters of breast cancer related deaths occur in the developing countries. This discordance in incidence and survival is largely related to the lack of organized mammographic screening in developing countries, the advanced stage at diagnosis (>60% of patients are diagnosed with stage III/IV breast cancer in the developing countries), poor access to care, and substandard treatment regimens [4]-[7].

Population-based survival represents the average prognosis of a cancer and is useful for assessing progress in cancer control, including the effect of early detection, diagnosis, treatment, and follow-up on cancer outcomes. The data are also helpful in making informed decisions to ensure improved and equitable cancer care [8].

Cancer survival statistics from developing countries are rare. The reasons for the paucity of information about cancer survival from developing countries are readily understandable. Cancer registries are a recent phenomenon in some developing countries, and do not exist at all in many others. Death registration in developing countries is often incomplete, not all deaths are registered, and the recorded cause of death may be inaccurate, or missing [9].

This study aimed to estimate the survival of a group of breast cancer patients followed up at the Yaoundé General Hospital (YGH) in Cameroon.

2. Patients and Methods

This was a retrospective study in which the medical records of breast cancer patients treated at the YGH between January 1995 and December 2007 were used. The end of the observation period of survival was the 31st of December 2013.

The YGH is one of the most specialized hospitals in the treatment of cancer in Cameroon. It has a number of services specialized in the treatment of cancers such as radiotherapy, medical oncology, anatomic pathology, nuclear medicine, gynecology and surgery. Breast cancer patients followed up at the YGH were most often referred from other health facilities and came from all parts of the country. The breast cancer treatment options offered in this institution are: radical mastectomy and breast conserving surgery; adjuvant and neoadjuvant chemotherapy with the use of the drug combination CAF (Cyclophosphamide: 500 mg/m^2, Adriamycin: 50 mg/m^2, 5-fluorouracil: 500 mg/m^2) every 21 days for 6 cycles; hormone therapy with Tamoxifen and radiotherapy delivered by a cobalt unit at the dose of 50 Gy over 5 weeks for post-mastectomy patients when indicated. However, in the case of breast conserving treatment, a dose of 50 Gy over 5 weeks with a boost dose of 15 Gy to the tumor site is administered.

Out of the 404 breast cancer patients registered in the YGH during the study period, 221 (54.75%) were included in our study. The patients excluded were those whose medical records were not found (139 cases) and those with no follow-up after diagnosis of breast cancer (44 cases).

The survival status of patients within 5 years or 10 years from the date of unequivocal diagnosis of cancer was obtained by active and passive methods. The passive assessment method of survival was based on medical records. Survival was calculated as the time between the date of diagnosis of cancer and the date of death from any cause or the date of loss to follow up or the date of last follow-up. The active measure undertaken to establish the survival status of patients without death information in their medical records was to contact the patient or their relatives by phone. The endpoint in this study was death, regardless of the cause. The socio-demographic

information, disease characteristics and vital status of patients were collected.

Global and specific (by age, stage of disease, and treatment modalities) survival curves were estimated via the actuarial method. The equality of these curves was tested using a log-rank test. Analysis was done using R v3.1.0 (Statistical analysis system, GNU GPL).

3. Results

Between January 1995 and December 2007, 404 breast cancer patients were followed at the YGH. Of these, 221 patients who had a medical record found in the archives were included in this study. The socio-demographic characteristics of the patients are shown in **Table 1**. The mean age of the patients was 47.5 ± 12.36 years. The most represented age group was 40 - 49 years. Slightly more than half (56.10%) of the study population lived in rural areas and 51.13% of the patients were housewives.

Table 2 shows the clinical and histopathological aspects of breast cancer in the study population.

Consultation for the symptoms presented by the patient was the circumstance of breast cancer discovery in 61% of cases and screening mammography was the circumstance of discovery only in 9.5% of cases.

Invasive ductal carcinoma was the most represented histological type of breast cancer (79.63%) while invasive lobular carcinoma was found in 4.52% of cases. About the various treatment modalities in this study; 64.70% of patients underwent a radical mastectomy; 53.39% had neoadjuvant chemotherapy; 35.71% had adjuvant chemotherapy; 77.42% had radiotherapy and 19.0% had hormone therapy.

Table 1. Socio-demographic characteristics of breast cancer patients.

Variables	Patients n = 221 n (%)
Age groups (years)	
20 - 30 y	10 (4.5)
30 - 39 y	53 (24)
40 - 49 y	65 (29.4)
≥50 y	93 (42.1)
Marital status	
Married	83 (37.55)
Single	34 (15.38)
Widow	12 (5.42)
unknown	92 (41.62)
Profession	
Employed	97 (43.89)
Housewife	113 (51.13)
Unknown	11 (04.97)
Residential area	
Urban	92 (41.62)
Rural	124 (56.10)
Religion	
Christian	115 (52.03)
Muslim	14 (06.33)
Others	15 (06.78)
Unknown	77 (34.84)

Table 2. Clinical and histopathological aspects of breast cancer in the study population.

Variables	Patients n = 221 n (%)
Circumstance of breast cancer discovery	
Breast symptoms	135 (61.08)
Clinical breast examination	65 (29.41)
Mammography screening	21 (9.50)
Stage of breast cancer	
Stage I	4 (1.8)
Stage II	60 (27.14)
Stage III	123 (55.65)
Stage IV	27 (12.21)
Unknown stage	7 (3.16)
Histological subtype	
Ductal invasive carcinoma	176 (79.63)
Ductal *in situ* carcinoma	1 (0.45)
Lobular invasive carcinoma	10 (04.52)
Adenocarcinoma	23 (10.40)
Others	11 (4.97)
Therapeutic modalities	
Radical mastectomy	143 (64.70)
Breast conserving surgery	38 (17.19)
Neo adjuvant chemotherapy	118 (53.39)
Adjuvant chemotherapy	79 (35.74)
Radiotherapy	172 (77.82)
Hormone therapy	44 (19.90)

Figure 1 shows the overall survival curves for breast cancer over a period of 10 years. The overall median survival was 2 (1.9 - 3) years. Overall survival was 30% at 5 years and 13.2% at 10 years.

The specific survival curve according to the stage of disease is shown in **Figure 2**. The median survival was 5 (2.6 - 7.3) years at stage II; 3 (2.3 - 3.6) years at stage III and 1 (0.5 - 1.4) year at stage IV. All 4 patients in stage I were alive at the end of the observation period. There was a correlation between survival and the stage of disease. The highest survival rates were recorded in stages I and II and the lowest in stage IV. Furthermore, the difference between the survival curves at different stages of the disease was statistically significant ($p < 0.001$).

Figure 3 shows the survival curves for breast cancer with respect to age groups. There was no significant difference between these curves ($p = 0.15$).

Figure 4 shows the survival curves with respect to the type of surgery (**Figure 4(a)**) and treatment with radiotherapy or not (**Figure 4(b)**).

The median survival was 6 (2.8 - 9.1) years in patients who underwent breast conserving surgery and 2 (1.3 - 2.6) years for those who underwent radical mastectomy. Survival was significantly higher ($p = 0.01$) in the group of patients who underwent breast conserving surgery compared to those who underwent radical mastectomy.

On the other hand, there was no significant difference in survival ($p = 0.9$) between breast cancer patients who received radiotherapy and those who did not (**Figure 4(b)**). The median survival was 2 (1.4 - 2.5) years for patients who had radiotherapy and 2 (0.7 - 3.2) years for those who did not.
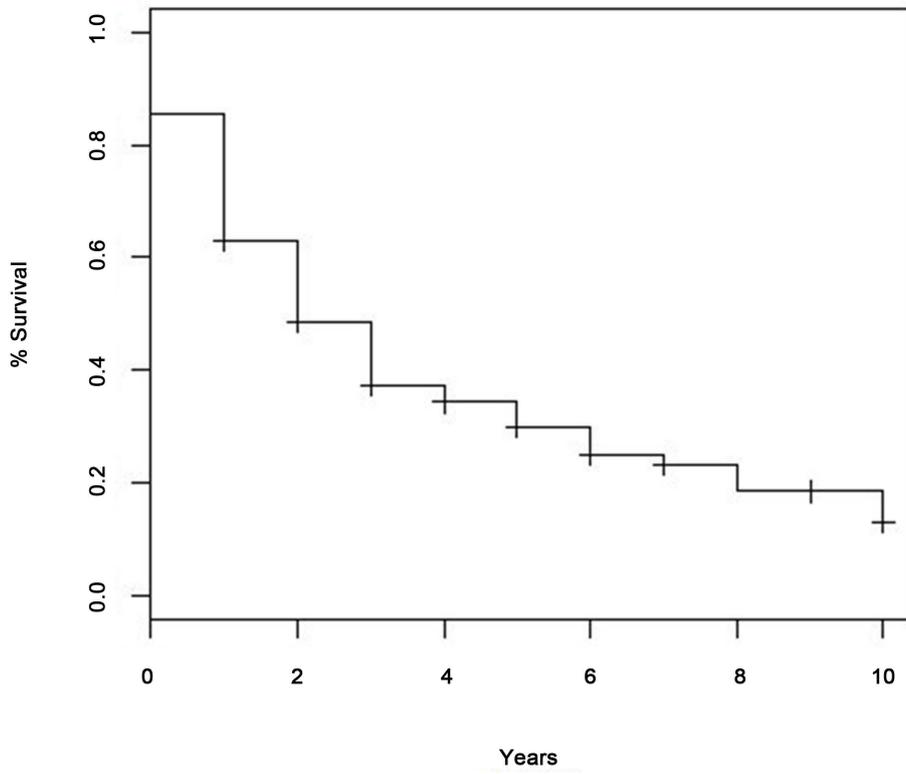
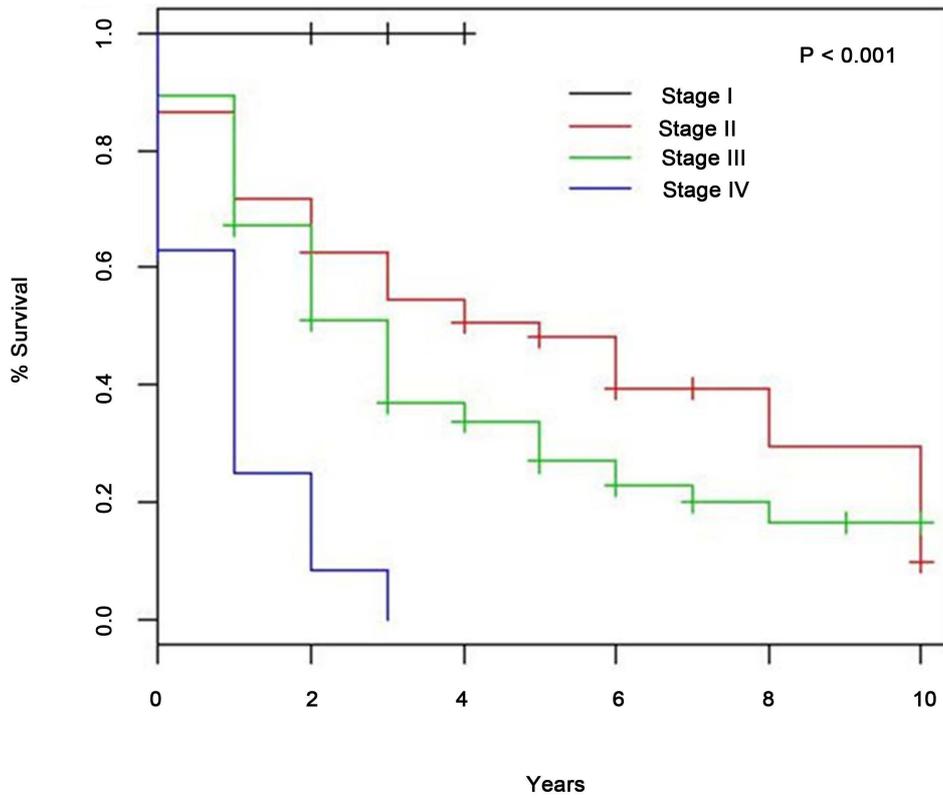**Figure 1.** Overall survival curves for breast cancer over a period of 10 years.

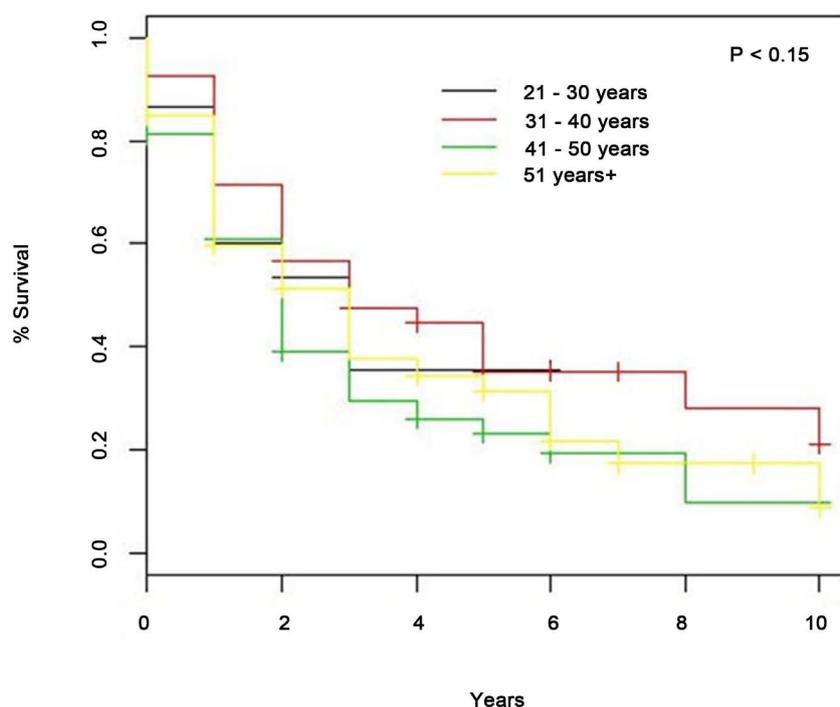**Figure 2.** Specific survival curves according to the stage of disease.

Figure 3. Survival curves for breast cancer with respect to age groups.
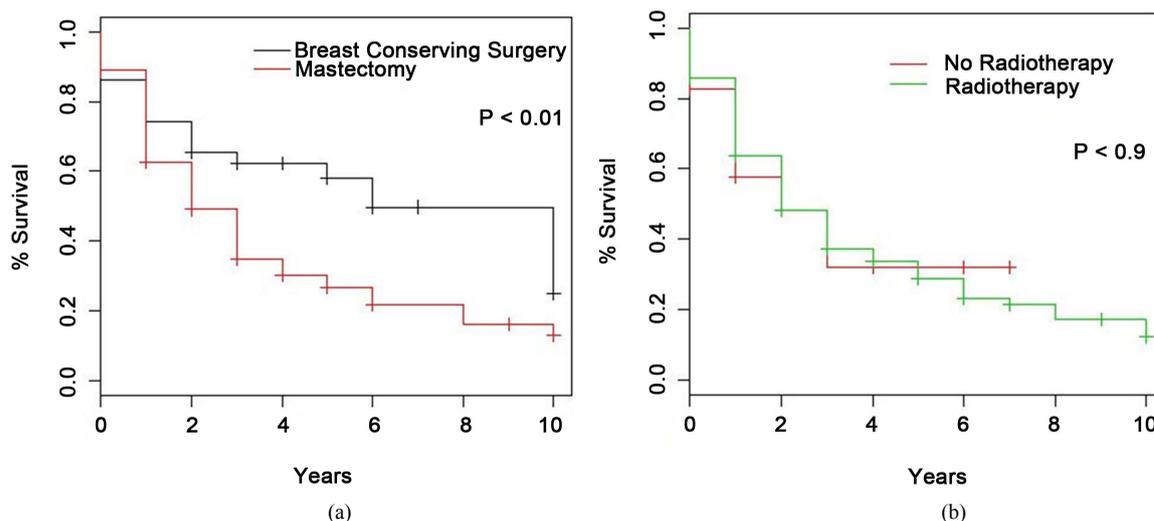

Figure 4. (a) Survival curves with respect to the type of surgery; (b) Survival curves with respect to the treatment with radiotherapy or not.

4. Discussion

Breast cancer management is a major challenge to physicians in developing countries [7]. As seen with many other developing countries, reliable data on survival following breast cancer management in Cameroon is lacking.

This study based on a cohort of breast cancer patients followed up at the Yaoundé General Hospital (YGH) in Cameroon revealed that, the overall survival rate at 5 years and 10 years were respectively 30% and 13.2%. Our results are worse when compared to the survival rate of breast cancer patients managed in developed countries which are 90% and 82% at 5 years and 10years respectively in the USA and 84% at 5years in France [10], [11]. This worse outcome of breast cancer patients in Cameroon is similar to that reported in Nigeria (25.6%), Tunisia

(50.5%), Uganda (46%) and Gambia (12%) at 5 years [8] [12] [13].

The poor survival from breast cancer in the developing countries when compared to some developed countries has been suggested to be related to the advanced stage at diagnosis and limited availability of adequate staging and therapy [3]. The later stage of disease at diagnosis in developing countries could be due to multiple factors like poverty, lack of screening programs low accessibility to diagnostic facilities, cultural beliefs constituting a barrier to early presentation [3]. The late stage of breast cancer (stage III, IV) represented 68% in this study confirming the data in the literature [12] [14]-[17].

Furthermore, the molecular and genetic differences in breast cancer may also contribute to geographic variations in survival. Insufficient data are currently available to define possible trends in different regions of the world [3]. In Cameroon, as in other developing countries, hormone receptors; HER2, p53, Ki 67 and BRCA1/BRCA2 expression could not be tested during the study period.

Overall survival varies according to the stage of breast cancer. Patients diagnosed with stage 0, I or II breast cancers tend to have higher overall survival rates than patients diagnosed with stage III or IV breast cancers [18].

Our results are similar to that of literature [18]. We observed a significant difference in survival between the different stages of breast cancer with the best survival being at stage I and II while the worse was at stage IV.

Breast cancer in young women compared to older women of 50 years and above is associated with a decreased survival [19]. As was seen in the study of Ben Gobrane *et al*. [20] at the Oncological Institute Salah Azaiez of Tunis, we found no significant difference in survival between the different age groups in our study. This could be due to a high proportion of advanced stage breast cancer in our study population which worsened the outcome, and to the low life expectancy in developing countries which could reduce considerably the survival of elderly women over 50 years. Internationally validated guidelines recommend adjuvant radiotherapy after breast conserving surgery and for patients with certain risk factors (T3/T4 or multicentricity) after mastectomy [21]. This strongly affects locoregional disease recurrence but has demonstrated a limited effect on long term survival [21]-[23].

In this study, there was no difference in survival between patients who underwent radiotherapy and those who did not probably due to high prevalence of advanced stage breast cancer.

Breast conserving surgery followed by adjuvant radiotherapy is an equivalent alternative to mastectomy for selected patients [22] [24] [25]. We found in this study significantly higher survival among patients who had breast conserving surgery when compared to those who had radical mastectomy. The difference in survival in these two groups could be due to the fact that breast conserving surgery is usually indicated for early breast cancer in contrast to mastectomy whose indications also include advanced stage disease.

The high proportion of loss to follow up because of unrecovered medical records is the main limitation of this study. This difficulty of archiving is very frequent in our hospitals and is a major challenge for research in developing countries. However, the results of this study provide an idea on breast cancer survival in our environment.

5. Conclusion

The overall survival rates of breast cancer are 30% at 5 years and 13.2% at 10 years among Cameroonian patients and are lower compared with 90% and 82% respectively at 5years and 10years in some developed countries [11]. Consistent to the literature, survival rates to the breast cancer in our study were correlated to stages of disease. These results challenge us to improve breast cancer care in our environment and especially to implement the breast cancer screening programs in our community in order to reduce the stage of disease at diagnosis. However, educational campaigns will be a first step because early detection cannot be successful if the population is unaware of the problem or has adverse misconceptions about the value of early detection.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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