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Evaluation of patients' care pathway before the first consultation in the radiotherapy department of Centre Hospitalier Nganda (Kinshasa) for breast cancer treatment

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Abstract

Introduction: That study assesses the care pathway to detect the reasons why the patients reached the radiotherapy department of Centre Hospitalier Nganda with advanced breast cancer.

Material and Methods: We conducted a descriptive and analytical cross-sectional study from March 2024 to June 2024. We included all new breast cancer patients in our center. A p-value ≤ 0.05 was considered statistically significant for all analyses. An average comparison between quantitative variables was performed using the non-parametric Kruskal-Wallis test.

Results and discussion: We enrolled 54 patients. The mean age was 53.13 ± 11.94 years and the median age was 51 years. A breast mass dominated the clinical picture in 87.07% of cases. Regarding the first medical contact, 77.78% of patients sought care in a conventional medical center. During the treatment, 31.48% of patients had received traditional pharmacopeia and 16.67% had undergone holistic treatment. Regarding radiotherapy indications, 14.81% of patients had no relevant indication for irradiation. The average time between the first symptoms and the radiotherapy consultation was 12.9 ± 9.2 months. There was a statistically significant positive correlation between the time from first symptoms to radiotherapy consultation and the staging of the disease (P-value=0.023). Patients who sought care at home (OR: 1.1; 95% CI 0.13-6.89) or in a conventional medical center (OR: 1.49; 95% CI 0.35-7.77) were all at risk of reaching radiotherapy with an advanced disease.

Conclusion: The care pathway of breast cancer patients has a global impact on the outcome and also on the prognosis.

Keywords: Breast cancer; Patients 'care; Radiotherapy; Advanced stage

1. Introduction

Breast cancer is the most common cancer worldwide, ahead of lung cancer, with 2,261,419 new cases in 2020, or 11.7% of all cancer cases, and 684,996 deaths, or 6.9% [1,2]. Its incidence and mortality rates are expected to rise considerably over the next few years. The incidence of breast cancer has risen significantly over the last two decades, reaching 2.0%

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per year, and is expected to reach more than 19.3 million women by 2025, the majority of whom are from sub-Saharan Africa [1–3].

Breast cancer survival has gradually improved in developed countries over the years. In the United States, 5-year survival among African-American women rose from 71% to 80% between 1999 and 2016, and from 87% to 91% among Caucasian American women [1,3]. In developing countries, on the other hand, breast cancer is often diagnosed at an advanced stage and survival rates are generally low [2–5]. In the Democratic Republic of Congo, 36% of patients consult a doctor 12 months after the appearance of the first symptoms, i.e. 34% at stage 4 [4].

Shortening the time between the first symptoms and treatment is crucial for better therapeutic responses, as the factors associated with the late presentation of breast cancer can be modified [5,6]. Although emphasis has been placed on patient-inherent choices in the pre-treatment window as a cause of late presentation, recent studies in Nigeria, Ghana, and Rwanda show an increasing influence of healthcare providers on events occurring in this window [1,7].

In addition, public perceptions of the causes of cancer play an important role in treatment behavior. Negative perceptions and patient blame are linked to patient stigma and disbelief in treatment [1,8,9]. Despite numerous awareness campaigns and months of dedicated advertising, cancer, particularly breast cancer, continues to weigh heavily on the health systems of sub-Saharan African countries—the late detection results in a higher mortality rate than in developed countries [10]. Numerous studies have identified stigma as a barrier to treatment-seeking behavior and recommend more research to understand and combat stigma [5,8,9].

In Cameroon, as in the DRC, delays in consultation, diagnosis, and treatment are among the factors that influence the stage of the disease [2,4,11]. The reasons for late diagnosis of breast cancer in these particular contexts are multiple and dominated by financial problems, prejudice, lack of information, and fear. More than half of breast cancer patients in sub-Saharan Africa have a low socio-economic status, and very few have access to diagnostic facilities [2,4,8,11,12]. Assessing delays therefore appears to be a potential marker of access to care [2].

Radiotherapy remains essential among the different modalities of breast cancer treatment. Due to the increasing incidence of this cancer and the discovery of new indications for radiotherapy, demand has continued to rise and, as a result, waiting times have also increased [13–15]. Patients seen in the radiotherapy department for breast cancer treatment are generally either referred by other specialists, received after a multidisciplinary discussions meeting (MDT), or come on their own after an unconventional treatment course [5,6,9,13].

However, very few studies in our context have concerned the breast cancer care pathway before patients' arrival in the radiotherapy department. That study assesses the care pathway intending to detect the reasons why patients are reaching the radiotherapy department with advanced breast cancer.

2. Material and methods

We conducted a descriptive and analytical cross-sectional study at the radiotherapy department of Centre Hospitalier Nganda, Kinshasa/Democratic Republic of Congo from March 2024 to June 2024. The radiotherapy department has a linear accelerator that can deliver Intensity-modulated radiation therapy 'IMRT' and Volumetric modulated Arc Therapy 'VMAT'. We first obtained ethical clearance from the ethics committee and then every patient signed a consent form for inclusion. All patients seen for their first consultation in the radiotherapy department for breast cancer or its complications were included in the study. Excluded from the study were patients with no histopathology results available, or with conflicting histopathology results for the same breast tumor, patients who had already received radiotherapy for the same pathology in another center, and patients with bilateral breast cancer. Our sampling was of the consecutive non-probability type. Patients with breast cancer seen in radiotherapy consultations were interviewed consecutively using our quiz after checking the exclusion criteria, which made it possible to complete the data collection forms. Quantitative variables were described by their average, standard deviation, minimum, and maximum. For those variables whose standard deviation was greater than the mean, we considered their median, first, and third quartiles. Qualitative variables were described by their number and percentage. A p-value of less than 0.05 was considered statistically significant for all analyses. Mean values were expressed with a 95% confidence interval. The Kruskal-Wallis non-parametric test was used to compare means between quantitative variables. Statistical analyses were performed using Microsoft Excel version 2020, Epi info version 7.2.6, on a Windows version 10 professional operating system.

3. Results

3.1. Sociodemographic results

We enrolled 54 patients in this study. The group with age between 40 to 49 was the most represented with almost 28% as shown in Figure 1. The mean age was 53.13 ± 11.94 years, with extremes of 33 and 83 years and a median age of 51 years.
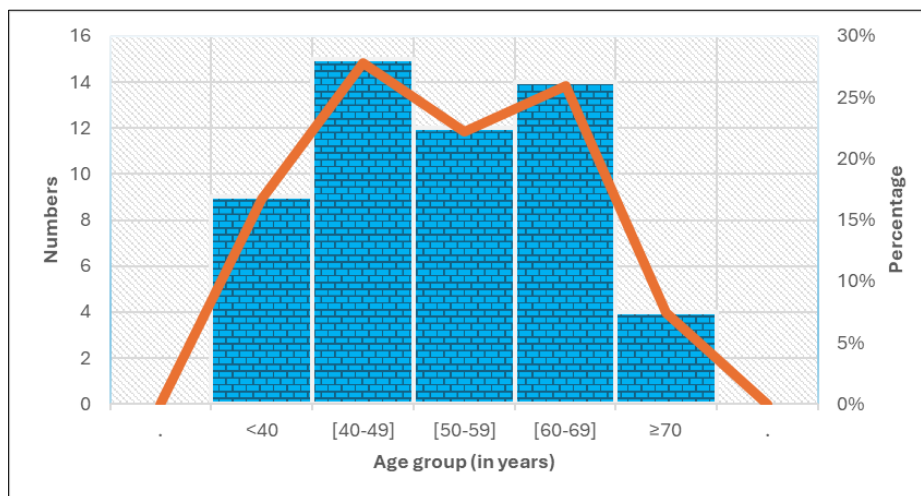

Figure 1 Breakdown of patients by age group with frequency polygon

The other socio-demographic characteristics are resumed in Table 1 below

Table 1 Socio-demographic characteristics

SN	Socio-demographic characteristics	Variables	Number (n=54)	%
1	Parity	Multiparous	37	68.52
		Nulliparous	9	16.67
		Primiparous	8	14.81
2	Marital status	Single	12	22.22
		Divorced	2	3.70
		Married	27	50.00
		Widow	13	24.07
3	Menopausal status	Menopausal	32	59.26
		Premenopausal	22	40.74
4	Level of study	None	6	11.11
		Primary	15	27.78
		High school	19	35.19
		University	14	25.93
5	Professional information	Retired	5	9.26
		Formal sector	21	38.89
		Non-formal sector	28	51.85
6	Nationality	Congolese (DRC)	45	83.33
		Foreigner	9	16.67

Most of the patients in this study were multiparous, married, and postmenopausal women. Female patients who had been in high school represented 1/3 part of our population.

3.2. Patients' symptoms, consultation delays, the number of consultations before radiotherapy

The clinical circumstances of discovery were dominated by a mass in the breast, followed by breast pain and nipple retraction as shown in table 2 below.

Table 2 Distribution of patients according to first symptoms, the delays, and the number of consultations

SN	Category	Variables	Number	%
1	Circumstances of discovery (n=54)	Mass in the breast	47	87.04
		Diffuse swelling	4	7.41
		Breast pain	8	14.41
		Nipple retraction	8	14.41
		Bloody discharge	4	7.41
		Breast ulceration	4	7.41
		Palpable adenopathy	7	12.96
		Bone pain	4	7.41
		Weight loss	4	7.41
2	Consultations delays (n=54)	<4months	29	53,7
		[4 – 7[months	19	35
		[7-12[months	5	9
		≥ 12 months	1	2
3	Consultations before radiotherapy (n=54)	Single consultation	34	62.26
		More than one consultation	20	37.74

3.3. The delay between the first symptoms and the consultation in radiotherapy

The overall mean time from first symptoms to radiotherapy consultation was 12.9 ± 9.2 months. The mean time from first symptoms to radiotherapy consultation for each stage of the disease increased significantly (P-value=0.023). (Fig. 6).
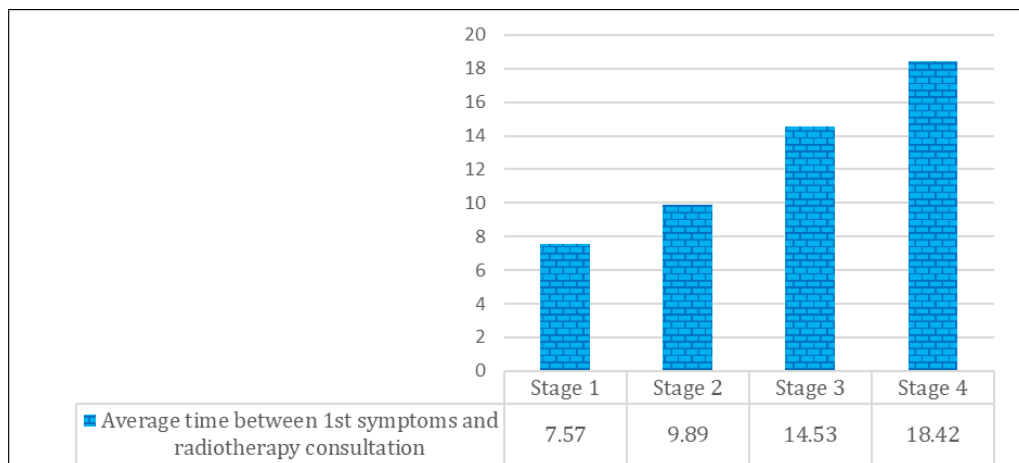

	Stage 1	Stage 2	Stage 3	Stage 4
Average time between 1st symptoms and radiotherapy consultation	7.57	9.89	14.53	18.42

Figure 2 Distribution of patients regarding the staging of the tumor and the average time between the first symptoms and radiotherapy consultation

3.4. Multidisciplinary decision and clinical features taken into account

The clinical, pathology, and biomolecular features taken into account by the multidisciplinary meeting to support the radiotherapy indications are shown in Table 3 below.

Table 3 Distribution of patients according to clinical, pathologic, and biomolecular features

SN		Clinical aspects of radiotherapy consultations	Variables	Fréquency	%
1	Clinical Aspects of EBRT	Consultation mode (n=54)	Referral	34	62.96
			MDT	19	35.19
			Coming of its own accord	1	1.85
		Reference mode (n=34)	Private clinic	29	85.29
			Public hospitals	5	14.71
		Affected breast (n=54)	Right breast	24	44.44
			Left breast	30	55.56
		Stage of disease (n=54)	Stage 1	7	12.96
			Stage 2	18	33.33
			Stage 3	17	31.48
			Stage 4	12	22.22
		Type of breast surgery performed (n=46)	Preservative surgery	4	8.70
			Mastectomy	42	91.30
2	Pathology Features	Histological type (n=54)	Invasive ductal carcinoma (or NOS)	52	96.30
			Lobular carcinoma	1	1.85
			Medullary carcinoma	1	1.85
		Histological grade (n=54)	Grade 1	13	24.07
			Grade 2	30	55.56
			Grade 3	11	20.37
3	biomolecular features	Immunohistochemical subtype (n=46)	HER2	3	6.52
			Luminal A	18	39.13
			Luminal B / HER2-negative	7	15.22
			Luminal B / HER2-positive	7	15.22
			Triple-negative	11	23.91

EBRT=External Beam Radiation Therapy; HER2= Herceptin 2 receptor; MDT=Multi-Disciplinary Team

3.5. The distribution of patients regarding the type of the first center and the type of medications received

The vast majority of patients first sought care in a conventional medical center 42 (77.78%), while the others either stayed at home (6 cases or 11.11%) or went to a non-conventional medical center, accounting (6 cases or 11.11%).

Regarding the type of treatment, all 54 patients have received conventional medicine. Additionally, 46 (85.19%) have received breast surgery, 17 (31.48%) of patients have received traditional pharmacopeia, and 9 (16.67%) have undergone holistic treatment. The breast surgery was done in 46 (85.19%) cases. Among the 54 patients receiving conventional medicines during their treatment, 46 (85.19%) had received at least one cycle of chemotherapy treatment. At the time of the radiotherapy consultation, 22 of the 54 patients had already received or were receiving hormonal

treatment for breast cancer. 72% of these patients were receiving Tamoxifen. None of them had received a CDK4/6 inhibitor.

3.6. Indications of radiotherapy

The multidisciplinary team did not retain radiotherapy for 8 patients (14.81%). There was a clinical benefit for irradiating 46 patients (85.19%). The treatment goal was curative intent for 40 patients and palliative for 8 patients. Patients requiring curative irradiation were 35 adjuvant radiotherapy and 5 neoadjuvant chemoradiation.

3.7. Univariate analysis

The factors associated with advanced disease at the radiotherapy consultation are reported in Tab. 4 below. It shows that patients who had received care at home or in a conventional medical center have a risk of reaching the radiotherapy department with an advanced disease, with no significant p-value. However, holistic treatment and the traditional medicines used during the patient's course of care were not associated with advanced disease at the radiotherapy consultation.

Table 4 Univariate analysis of factors associated with advanced disease

		Advanced stage (3 and 4)			
	Yes	No	Total	OR (95% CI)	P-value
Associated factors	**n (%)**	**n (%)**	**n (%)**		
Place of first recourse to healthcare					
Home	2 (33.33)	4(66.67)	6(11.11)	1.1(0.13-6.89)	1.00
Non-conventional Medicine centre	1(16.67)	5(83.33)	6(11.11)	0.41(0.02-3.24)	0.65
Conventional Medicine Centre	14(33.33)	28(66.67)	42(77.78)	1.49(0.35-7.77)	0.73
Type of treatment received during the course					
Traditional pharmacopoeia	3(17.65)	14(82.35)	17(31.48)	0.36(0.7-1.41)	0.21
Holistic therapy	0(0)	9(100)	9(16.67)	0(0-0.75)	0.04
Chemotherapy	17(36.96)	29(63.04)	46(85.19)		0.04
Indication of Radiotherapy					
Neoadjuvant Chemoradiation	3(100%)	0(0%)	3(06.82%)	8.89(0.43-183.16)	0.10
Adjuvant radiotherapy	12(34.28%)	23(65.71%)	35(74.54%)	0.03(0.001-0.52)	<0.05
Palliative radiotherapy	6(100%)	0(0%)	6(13.64%)	0.41(0.01-23.48)	0.01

NB: OR : odds ratio ; **95% CI** : 95% confidence interval; **n :** number of patients ; **P-value** : significance.

4. Discussion

We studied the care pathway of 54 patients before their radiotherapy consultation for breast cancer or its complications at the radiotherapy department of Centre Hospitalier Nganda/Kinshasa (DRC). The majority of patients in this study were aged between 40 and 49 years, similar to the age range found by B.G. Malingisi et al. at the Cliniques Universitaires de Kinshasa in 2022, where 29% of the sample was aged between 43 and 50 years [4]. In a similar study in Cameroon, J. D. Kemfang Ngowa et al. D. Kemfang Ngowa et al. reported that the 40 to 49 age group was in the majority with 38% of cases [2]. These figures reinforce the socio-demographic similarities in sub-Saharan Africa [12].

Throughout their treatment, 53.7% of patients sought care within four months following the appearance of the first symptoms. This figure differs from those found in several studies published in sub-Saharan Africa, where most patients first sought care ten months after the onset of symptoms [1,4,12,16]. This difference in time to first referral could be

explained by the fact that the screening of time to first referral was based solely on first consultations in conventional hospital facilities in these studies, and by the fact that in our study patients also had first referrals in non-conventional health facilities as well as in their homes. The time and place of first recourse to care for breast cancer patients remain important factors in the therapeutic decision at the time of the radiotherapy consultation [5,13].

Even if 77.78% of the patients in our study had their first recourse to care in a conventional medical center, it is important to question the attitude of the others who either stayed at home or went to a non-conventional medical center, with 11.11% of cases in each group. Lack of access to the right information, fear of discrimination, and difficult access to conventional medical centers in certain localities of DRC, as elsewhere in sub-Saharan Africa, could corroborate these results [2,5,16]. Togawa et al. found in a multicentric study in Zambia, Uganda, and Nigeria that rural residence was associated with a delay in diagnosis, with 46% of patients in their series living in rural areas [7].

Throughout their treatment, 31.48% of patients had received traditional pharmacopeia and 16.67% had undergone holistic therapy. Although the pharmacopeia is becoming better codified, following the example of the work of Pieme et al. in Cameroon [17], it is nonetheless true that many patients follow traditional treatments in an uncontrolled way, either because of their traditional beliefs in Africa and Asia, or because of a lack of access to better quality care. [1,12,14,15]. Furthermore, for socio-economic reasons, some patients prefer to start their treatment with phytotherapy. Tah-Monunde et al. demonstrated in the North-West region of Cameroon that phytotherapy treatment for breast cancer costs an average of $377.91 compared with conventional chemotherapy, which could cost up to $5942 [18].

After the radiotherapy consultation, 14.81% of patients had no relevant indication for irradiation. This significant figure may be explained by the fact that many patients drag their feet during their treatment and arrive at advanced stages of the disease, but also by the fact that some referring staff have biased knowledge of the role and place of radiotherapy [19–22]. In addition, most of the patients in our study requiring irradiation indicated adjuvant radiotherapy (79.55%). Palliative radiotherapy (13.64%) and neoadjuvant chemoradiation (6.82%) completed the list of indications. For patients with non-metastatic inflammatory breast cancer who had not responded to initial chemotherapy, we indicated chemoradiation following the work of Bellière-Calandry A, et al. [23].

Of the 13 postmenopausal patients on hormone therapy, 84.62% were on aromatase inhibitors and 15.38% on tamoxifen. However, among the 9 premenopausal patients on hormone therapy, more than half were on an aromatase inhibitor (55.56%) and only 44.44% on tamoxifen. These results of oncology practice in the patient pathway diverge from the recommendations in terms of prescribing hormone therapy, as demonstrated by the SOFT and TEXT trials, which showed that in high-risk pre-menopausal women with hormone receptor-expressing (HR+) breast cancer, the anti-aromatase Exemestane regimen combined with ovarian suppression was better at preventing relapse than tamoxifen combined with ovarian blockade [24]. However, compared with aromatase inhibitors alone, tamoxifen remains the hormonal treatment of choice for women under 50. Aromatase inhibitors alone do not indicate the age of 50, as they only inhibit the biosynthesis of estrogens produced by the aromatization of adrenal androgens, without blocking their production in the ovaries, as reported in several meta-analyses [25–27]. The socio-economic conditions, sometimes precarious, the lack of availability of appropriate drugs, and the failure of certain health practitioners involved in the breast cancer care chain to upgrade their skills could well explain this discrepancy between the recommendations and prescriptions during the patient's care [1,2,9,12,20].

In our study, the mean delay between first symptoms and radiotherapy consultation for each stage of the disease increased significantly (P-value=0.023). This increase with stage clearly shows that the longer a patient goes through the treatment process, the more likely she is to arrive at a radiotherapy consultation at an advanced stage, and the more likely her indication for irradiation is to vary or even be compromised. In addition, during their treatment, some patients refuse certain conventional care, in this case chemotherapy, and then end up accepting it after other therapeutic options have failed [5,18]. The fact that practitioners in health facilities do not refer patients as soon as possible also lengthens the time taken before the radiotherapy consultation [20]. In these series, patients who had sought care at home and those who had first visited a conventional medical center were at risk of arriving at the radiotherapy department at an advanced stage, even though these risks were not significant. These results are in line with the data in the literature explaining the risk factors for late treatment of breast cancer in sub-Saharan Africa; whether they stay at home or go to a hospital, the quality and time taken for treatment also depend on the technical facilities, the availability of drugs and the skill of the practitioner [1,3,9].

5. Conclusion

Patients with breast cancer seen for radiotherapy treatment have a variety of previous histories. This pathway therefore has an overall impact on the treatment process regarding their initial assessment in radiotherapy. Shortening the time

taken to complete the care pathway would significantly reduce the frequency of advanced diseases in radiotherapy consultations. Stepping up public awareness campaigns, making the right drugs available, and upgrading health staff in all health facilities involved in breast cancer care should considerably improve the care pathway for these patients, and even their prognosis.

Compliance with ethical standards

Acknowledgments

Disclosure of conflict of interest

The authors declare that they have no conflict of interest concerning this article.

Statement of ethical approval

We carried out this study in strict compliance with the fundamental principles of medical research: the principle of the interest and benefit of the study, the principle of the harmlessness of the research, and confidentiality. As a result, our research protocol was submitted to the ethics committee of the Nganda Hospital for verification of compliance and medical ethics.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

Authors' contributions

Conception and design: DA, EEF, YM, MR, MAM. Data collection: EEF, HN, BNGD, NR. Data analysis and interpretation: DA, EEF, YM, MR, VN. Manuscript writing: DA, EEF, YM. Manuscript review: All authors.

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