ORIGINAL ARTICLE

PATTERN OF METASTATIC BREAST CANCER IN NIGERIA: A RETROSPECTIVE REVIEW OF CASES FROM NATIONAL HOSPITAL, ABUJA

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ABSTRACT

Background: Metastatic Breast Cancer is a common presentation among breast cancer patients in Nigeria. There has been a slight decline in breast cancer mortality, which can be attributed both to the success of early detection programs and advances in treatment.

Objective: To determine the pattern, sites, and outcomes of metastatic breast cancer among patients treated at the National Hospital, Abuja.

Methods: This was a retrospective study that involved all patients with a histopathology-confirmed diagnosis of breast cancer from January 2017 to December 2022 at the radiotherapy department of the National Hospital, Abuja. Data were analysed by SPSS version 2.0.

Results: The mean age of the studies was 47.2 (SD=11.5) years. More than half of the patients had metastasis, 153(54.8%). (37.7%) had metastases to the bone, 22.9% had metastasis to the lungs, 22.0% had metastasis to the spine, 18.1% had metastasis to the liver, and 10.7% had metastasis to the brain. Patients with multiple metastases died within one year, while solitary metastasis had 25% mortality within 1 year and 53% mortality in 5-year follow-up (Log-rank test 0.0001).

Conclusion: Despite improving breast cancer outcome, distant metastasis is common, incurable and hence a major challenge. Early recognition through diagnosis of metastatic disease will allow rapid institution of effective palliative treatment. This will improve the quality of life of patients.

Keywords: Breast cancer, Metastasis, Delayed presentation, Pattern of spread

INTRODUCTION

Breast cancer (BC) accounts for 23.8% of all female cancers and 15.4% of female cancer deaths worldwide, making it the most commonly diagnosed disease and the leading cause of cancer death in women.[1] An estimated 23 million new cases were diagnosed worldwide in 2022, making up to 25% of all new cases of cancer in women.[1] In 2022, there were an estimated 666,000 BC deaths among women.[1,2] With a lower average age of diagnosis, a higher stage at presentation, and a larger percentage of triple-negative BC, it is the most common malignancy among women in Sub-Saharan Africa.[3] In nations with low and medium Human Development Indexes, BC is the second most common cause of cancer-related deaths among women.[1]

Approximately 30% of people worldwide who receive an early breast cancer diagnosis will go on to develop metastases. Few people receive a metastatic diagnosis initially, while many others typically receive for advanced cancers. Most people develop metastases months to years after receiving an initial diagnosis and therapy. A higher likelihood of metastases is linked to a larger tumour size.[4] Cancer-associated morbidity and mortality in Nigeria are worse in metastatic disease and are typically correlated with the severity or clinical stage of the disease. Vital organs such as the brain, liver, lungs and bones are frequently affected by breast cancer metastases, which raises symptom load, lowers quality of life and ultimately increases mortality.

Both overall and cancer-specific survival have been demonstrated to be negatively correlated with multiple metastases.[5] Metastases are the leading cause of mortality in patients diagnosed with breast cancer.[6] Most breast cancer deaths are due to advanced cancer diagnosed when metastases have already disseminated to the lymph nodes or distant organs.[6] Despite many advances in diagnosis and screening, the disease is frequently discovered after spread to regional lymph nodes or after dissemination of distant metastases. The most common sites for metastases of breast cancer are the bones, liver, lungs and brain.[7]

This study showed the pattern of metastatic breast cancer in Nigeria and its outcomes.

MATERIALS AND METHODS

The study was carried out in the Radiotherapy and Oncology department of National Hospital Abuja, (NHA) Nigeria. It serves as a referral centre for oncology services from all over Nigeria. All patients with a histological diagnosis of breast cancer treated at the Oncology department, NHA, from January 2017 to December 2022 who met the study criteria were evaluated.

Study Population

All patients diagnosed with breast cancer in the hospital within the specified period.

Study inclusion criteria

The following criteria were included in the study:

1. Patients with histopathology-confirmed breast cancer.
2. Patients who had a comprehensive history and physical examination carried out, including clinical staging, laboratory investigation and imaging.
3. Patients with properly documented treatment records.

Study exclusion criteria

The following criteria were excluded from the study:

1. Patients who were unable to undergo staging investigations.
2. Patients with incomplete and poorly documented medical records.
3. Patients with other primary malignancies.

Data description and method collection

All available case notes and treatment records of breast cancer patients seen from January 2017 to December 2022 were retrieved.

Information obtained from the case notes and treatment records included patients' biodata, including age at presentation, sex, ethnic group, occupation, marital status, employment and educational level. The socioeconomic level was classified.

Duration of illness, site of disease and size of tumour, History of co-morbidity were documented. Pathological features of the disease, like clinical tumour size, stage at presentation, nodal status, histology, grade and molecular subtype of the tumour and the sites of metastases were also documented. The patients were staged at the time of presentation using the 2010 edition of the American Joint Committee on Cancer (AJCC).

The details of treatment received were taken into consideration: radiotherapy dose, type of surgery, chemotherapy regimen, targeted therapy and hormonal therapy. The status of patients was determined at 2 and 5 years after diagnosis. The time of completion of treatment, time of first loco-regional recurrence and/or metastasis after completion of treatment were also noted. The above information was extracted from records using data extraction. However, if the missing data involved those in the inclusion criteria, the patients were excluded.

Data analysis

Socio-demographic, clinical and treatment variables of patients were presented in tables and pie charts using frequency, percentage, mean, median, mode, range and standard deviation. Independent variables such as age, sex, duration of illness before presentation, stage of disease, metastasis, comorbidity, social habits, histology, grade, type of surgery, axillary clearance and hormonal treatment. Data were analysed by SPSS version 2.0

RESULTS

Characteristics of patients presenting with breast cancer

A total of 814 patient case records that met the selection criteria were retrieved and analysed. The mean age was 47.2 (SD=11.5) years. The majority of the patients were multiparous (46.7%). More than half attended menarche at 14 years and above (59.3%). The mean age at menarche was 14.2 (SD=1.6). Five hundred and ninety-three patients were premenopausal (72.9%).

Table 1. Characteristics of patients presenting with breast cancer

Variables	Frequency(N=814)	Percent (%)
Age group		
Mean (SD)	47.2(11.5)	
20-29	31	3.8
30-39	183	22.5
40-49	282	34.6
50-59	185	22.7
60-69	100	12.3
70-79	28	3.4
≥80	5	0.6
Parity		
Nulliparous	69	8.5
Multiparous	380	46.7
Grandmultiparous	365	44.8
Age at Menarche (years)		
Mean (SD)	14.2(1.6)	
10-13	328	40.3
14-18	483	59.3
>18	3	0.4
Menopausal status at presentation		
Pre-menopausal		
Post-menopausal	593	72.9
	221	27.1

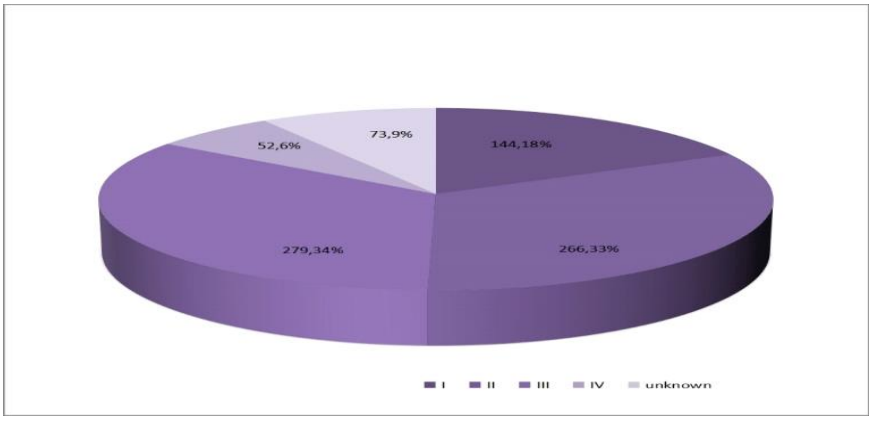

Figure 1. Distribution of patients' stage at presentation

Figure 1 shows the distribution of patients' stage at presentation; most of the patients were in stage III, 279(34%) and in 73(9%) patients, the stage was unknown.

Table 2. Tumour characteristics

Variables	Frequency	Percentages (%)
Tumour site		
Left	476	58.5
Right	307	37.7
Bilateral	31	3.8
SBR grade		
Well	109	13.4
Moderate	348	42.8
Poorly	209	25.7
Unknown	148	18.1
Receptor Status		
Luminal B (ER+, PR+ Her2 neu+)	213	26.2
Luminal A (ER+, PR+, Her2 neu-)	359	44.1
Basal-like (Triple -ve)	435	53.4
ER-ve, PR-ve, Her2 neu+	86	10.6
Nature of Chemotherapy		
AC	76	9.3
FEC	201	24.7
Taxanes	175	21.5
Transtuzumab	19	2.3
Carboplatin/Paclitaxel	198	24.3
Others	145	17.8

Table 2 shows the tumour characteristics of patients. More than half (58.5%) of the patients had primary tumours on the left breast, 37% had primary tumours on the right breast, and 3.8% had bilateral disease. About a quarter (44.1%) were luminal A, 26.2% were luminal B, while 53.4% were triple negative (Basal-like).

Table 3. Frequency distribution of stage according to the occurrence of metastasis

Stage	Developed Metastasis	Without Metastasis	Total	P-value
I	0(0)	144(100)	144	<0.001
II	79(29.7)	187(70.3)	266	0.022
III	153(54.8)	126(45.2)	279	<0.001
IV	52(100)	0(0)	52	<0.001

Table 4. Site of metastases

Site of metastasis at presentation	Total	Percentages (%)
Palpable Ipsilateral	126	40.9
Palpable contralateral	74	24.0
Palpable bilateral	31	10.1
Ipsilateral supraclavicular	43	14.0
Contralateral supraclavicular	21	6.8
Bilateral supraclavicular	13	4.2
Bone	19	36.5
Lung	13	25.0
Spine	9	17.3
Liver	7	13.5
Brain	4	7.7
Metastasis to two or more sites		
Bone, lung	2	0.3
Lung, spine	1	0.1
Lung, liver	1	0.1
Liver, lung, bone	3	0.4
Lung, spine, brain	2	0.3
Lung, brain	1	0.1
Spine, liver	2	0.3
Bone, liver	1	0.1

Table 3 shows the association between stage and metastasis. Among 144 patients with stage I, none had metastasis. Seventy-nine patients (29.7%) had metastasis who presented with stage II disease. More than half of the patients who presented with stage III disease, 153(54.8%), had metastasis. All the patients in stage IV had metastasis, 52(100%). However, this data showed there was a significant association between metastasis and stage ($p<0.05$).

Ipsilateral axillary nodes was observed in 73(45.6%) of patients. The contralateral breast was involved in 3(1.9%) of patients. Bone metastases was found in 54(26.3%) patients.

DISCUSSION

In this study, the mean age of breast cancer patients was 47.2 (SD 11.5). This is similar to findings by Nggada and colleagues[8] and Adesunkanmi and colleagues.[9] This is also consistent with studies from Dauda et al.[10] Breast cancer is more aggressive in premenopausal women, and it is associated with high mortality and more likely to recur after treatment, locoregionally or at distant sites, than in older women.[11] The majority of the patients presented at late stages III and IV. In this study, 46.7% were multiparous and 40.3% had early menarche (<12 years).[12]

About 72.9% of these patients were premenopausal, and 27.1% were postmenopausal, which is similar to the study by Umoke et al.[13] This further affirms the early age of onset of breast cancer in Africa.[14]

Invasive ductal carcinoma constituted 82.8%, similar to Ntekim et al.[15] The left-sided breast cancers was more common, which is similar to the findings of Mokone et al.[16] 44.1% were luminal A, 26.2% were luminal B, while 53.4% were triple negative (Basal-like). Anthracyline was commonly used 24.7%, 21.5% received taxanes, 24.3% received carboplatin and paclitaxel, while 2.3% received trastuzumab.

In this study, 144 patients with stage 1disease at presentation, had no metastases afterwards. Seventy-nine patients (29.7%) who had stage II disease at presentation, developed metastasis, and more than half of the patients with stage III disease developed metastasis. However, this data showed there was a significant association between metastasis and stage ($p< 0.05$). Similar to Adejumo et al.[12] Bone was the commonest site of metastasis 26.3%, similar to Wu et al[16] and Umoke et al.[13] Lung metastasis was 22.9% similar to Adejumo et al.[12] The incidence of liver metastasis was 18.1% similar to Mokone et al[17] and was higher than the 5.2% reported by Hoe et al.[18] Brain metastasis was 10.7% similar to Adesunkanmi et al.[9]

Metastatic breast cancer is associated with a severe burden to the patients and the healthcare delivery system. This has led to increased effort on routine screening toward early detection of the disease, resulting in marked reduction in late presentation and incidence of metastatic disease in many centres in Western communities.[19,20]

CONCLUSION

Breast cancer mostly occurs among young women between the ages of 40 and 49 years. Most patients are premenopausal, belong to the low socioeconomic class, poor educational background and present at late stages.
The commonest site of distant metastasis was to the bone, followed by the lung, spine, liver, and brain. Distant recurrence remains common and incurable, and hence a major challenge. Early diagnosis of breast cancer can prevent metastatic disease and allow rapid institution of effective palliative treatment. This will improve the quality of life of patients after treatment and increase their lifespan.

RECOMMENDATIONS

It would be of good help towards patients presenting early, this will reduce local and distant metastasis and improve the quality of life of breast cancer patients in Nigeria if:

1. The provision of basic social amenities as well as better employment policies will improve the socioeconomic condition and standard of living of the population at risk of breast cancer.
2. There is a need to equip existing hospitals in all states of the federation with facilities for cancer treatment to reduce cancer morbidity and mortality in Nigeria.
3. The Federal government supports the ongoing breast cancer awareness campaigns and education by several groups and organisations in the country on screening methods, risk factors, self-breast examination, and symptoms of breast cancer. This will encourage early presentation with early-stage disease and subsequently adherence with treatment and follow-up.
4. The provision of basic social amenities, as well as better employment policies, will improve the socioeconomic condition and standard of living of the population at risk of breast cancer. Since higher disease burden is seen in countries with a low standard of living.

5. Provision of facilities and expertise for immunohistochemistry will help in adequate care for the patients.

DECLARATIONS

Conflict of Interest: The authors declared no conflict of interest.

Ethics Committee Approval: The study was approved by the National Hospital. Abuja, Nigeria Research Ethics Committee (no: NHA/EC/029/2015 date: 29/7/2015)

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