



## **Access to Breast Cancer Care in Jos, North Central**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author AFA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors MWI and MAM managed the analyses of the study. Author MAM managed the literature searches. All authors read and approved the final manuscript.*

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## **ABSTRACT**

**Aims:** This paper seeks to evaluate the extent to which breast cancer patients from two tertiary health care centers in Jos were able to access the different components of breast cancer care.

**Background:** Breast cancer in low- and middle-income countries is associated with poor outcomes when compared with high-income countries. Numerous studies have identified factors responsible for this, one of them being a lack of access to the various components of breast cancer care. Breast cancer care requires a multimodal approach involving prevention, early detection, diagnosis and treatment, rehabilitation and palliative care. Access to the various modalities of care is key to a good outcome.

**Study Design:** This study is a retrospective study.

**Place and Duration of the Study:** The study was carried out at Jos University Teaching Hospital, and FOMAS Hospital which are both tertiary health care centers located in the city of Jos, Plateau State, Nigeria. The study spanned January 2016 to June 2019. We applied descriptive statistics for data analysis.

**Methodology:** We included all patients who were diagnosed with breast cancer between January 2016 and December 2017. Patients were followed up for a minimum of one and a half years (from January 2018 to June 2019). The project team performed a review of medical records and charts

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for data elements which included; sex, age, site of tumor, stage of tumor at presentation, and access to the different treatment modalities. Data was entered into a pre-designed proforma and analyzed on the SPSS 20 Chicago, Illinois. We applied descriptive statistics to the demographic data and clinical information of patients.

**Results:** The total number of patients was 110. Forty-four (40%) patients had access to immunohistochemistry (IHC). Eighty-nine (81%) patients were eligible for chemotherapy. Twenty-one (19%) patients were not fit for chemotherapy. Ten (9%) patients received radiotherapy. A total of 73 (66%) patients had different forms of breast surgeries. Three (3%) patients declined surgery, while 34 (31%) were not fit for surgery. Thirty-four (31%) patients were treated with hormonal therapy.

**Conclusion:** This study examined access to the various components of breast cancer care within two tertiary health centers. It shows that in our environment, there is limited access to immunohistochemistry, chemotherapy, radiotherapy and targeted therapy.

*Keywords: Access; breast cancer; care; modalities.*

## 1. INTRODUCTION

Breast cancer is the most common malignancy seen in Nigerian women. Approximately 500,000 new cases are seen annually [1]. It is the most common cause of cancer mortality in Nigerian women [2]. Breast cancer in low- and middle-income countries is associated with higher mortality when compared with high-income countries [3]. Numerous studies have identified factors responsible for this high mortality and they include; lack of access to the various components of breast cancer care, late presentation, cancers with an aggressive course, and poor compliance with treatment strategies [4].

Breast cancer care requires a comprehensive or multimodal approach involving prevention, early detection, diagnosis, treatment, rehabilitation and palliative care. This paper focuses on the access to breast cancer care and seeks to evaluate the extent to which breast cancer patients from two tertiary health care centers in Jos were able to access the different components of breast cancer care, as outlined above.

## 2. METHODOLOGY

### 2.1 Study Setting and Patient Population

This is a retrospective study carried out at two tertiary health care centers located in the city of Jos, Plateau State, Nigeria. These facilities receive breast cancer referrals from five neighboring states in addition to Plateau state.

### 2.2 Inclusion Criteria

All patients who were diagnosed with breast cancer between January 2016 and December 2017. Patients were followed up for a minimum

of one and a half years. We reviewed the medical records for the inclusion criteria, and the project team performed a review of charts for data elements.

### 2.3 Statistical Analyses

Data was entered into a pre-designed proforma and analyzed on the SPSS 20 Chicago, Illinois. We applied descriptive statistics to the demographic data and clinical information of patients which include sex, age, site of tumor, stage of tumor at presentation, and access to the different treatment modalities.

## 3. RESULTS

The total number of patients was 110. They were all female. The average age was 46.1 years (SD = 9.6 years). Sixty-three (57%) patients had carcinomas of the left breast, 43 (39%) had carcinomas of the right breast, while four (4%) had bilateral breast carcinomas.

The distribution of the stage at presentation for the patients is shown in Table 1.

Forty-four (40%) patients had access to Immunohistochemistry (IHC), while 66 (60%) patients did not. The distribution is shown in Table 2.

Eighty-nine (81%) patients were eligible for chemotherapy. Of that number, fifty-three (48%) patients completed chemotherapy, and 36 (33%) patients could not afford chemotherapy.

Twenty-one (19%) patients were not fit for chemotherapy due to poor performance status.

Only ten (9%) patients received radiotherapy.

A total of 73 (66%) patients had different forms of breast surgeries as follows: 63 (86%) had a total mastectomy, while ten (14%) had quadrantectomy. Three (3%) patients declined surgery, while 34 (31%) were not fit for surgery. None of the patients in this series had breast reconstruction or silicone implants.

Thirty-four (31%) patients were treated with hormonal therapy. Among the of the 34 patients treated with hormonal therapy, 25 had Tamoxifen, three had Exemestane, and six had Anastrozole.

**Table 1. Breast cancer stage at presentation**

T Stage	Frequency	Percentage (%)
T0	0	0
T1	0	0
Tx	7	6
T2	13	12
T3	21	19
T4	69	63
Total	110	100

**Table 2. Access to Immunohistochemistry (IHC)**

IHC Status	Frequency	Percentage (%)
Triple positive	7	6.4
Triple-negative	16	14.5
Estrogen and Progesterone receptor positive	11	10
Estrogen receptor positive	6	5.5
Progesterone receptor positive	1	0.9
HER-2 Receptor Positive	3	2.7
Total	110	100

#### 4. DISCUSSION

Prevention, early detection, diagnosis and treatment, rehabilitation and palliation are integral components of breast cancer care.

Prevention and early detection are often the first strategies employed when it comes to breast cancer care. Breast cancer prevention involves the control of specific modifiable breast cancer risk factors that could reduce the incidence of breast cancer in the long term [5,6].

Although some risk reduction may be achieved with prevention strategies, they cannot eliminate

the majority of breast cancers that develop in low- and middle-income countries [7, 8]. Therefore, early detection as part of breast cancer care becomes necessary to improve breast cancer outcomes [7,8].

Early detection strategies include breast self-examination, clinical breast examination and the use of screening mammography, with mammography being the only screening modality associated with reduced mortality [9]. Our study revealed that most patients presented with T3 (19%) and T4 (63%) tumors. We had no patient presenting with early stages (T0 or T1). This finding demonstrates the rarity of early presentation in our environment and is consistent with other studies from the region, which show that most people tend to present with advanced disease [10]. The late presentation may be partly related to the lack of organized population-based screening programs. Although mammography machines are available in a few hospitals, the cost of screening is relatively high, as such, patients do not routinely opt for screening. Furthermore, even though there is increased knowledge of breast self-examination due to health campaigns done by non-governmental organization, the impact of such heightened awareness on the health-seeking behaviors of people within the region has not been well studied.

After screening, patients must undergo triple assessment in order to make a definitive diagnosis of breast cancer. The triple assessment consists of clinical assessment, breast imaging and a biopsy [11,12]. The biopsy specimen is subjected to histological evaluation, including immunohistochemistry for estrogen receptor (ER), progesterone receptor (PR) and HER2/neu expression [13,14].

Tumor immunohistochemistry testing is critical to the modern management of breast cancer patients as it enables the use of targeted therapy either at the outset or after cyclical combination chemotherapy. In this study, 60% of patients did not have their tumor specimen subjected to immunohistochemistry (IHC), due to the unavailability of IHC testing in Jos (the location of our study). The 40% of patients who had IHC testing in our study were those who could afford the cost of out-of-state testing. Several studies from Africa show a consistent lack of facilities for immunohistochemistry testing in many parts of the region, underscoring the urgent need for the improvement and strengthening of medical systems within Africa [14,15]. The absence of

immunohistochemistry makes targeted therapy impracticable. The lack of targeted therapy may be contributory to the dismal outcomes associated with breast cancer management in developing countries [16].

Following diagnosis, patients should be offered treatment. Breast cancer treatment modalities include radiotherapy, surgery, chemotherapy, targeted therapy, hormonal therapy, and palliative care. The sequence in which these modalities are applied depends on the stage of presentation.

Indications for radiotherapy include ulcerated tumors, local recurrence and treatment of bony metastases. Furthermore, in patients who have undergone breast-conserving surgery, the surgery is usually followed by radiotherapy to eradicate local subclinical residual disease. Patients who have had a total mastectomy may also be offered radiotherapy for reasons such as positive postmastectomy margins, primary tumor greater than five centimeters, the involvement of four or more lymph nodes [17].

In our study, only nine percent of the patients had access to radiotherapy services. This is very low given that radiotherapy is an essential component of breast cancer care in neoadjuvant, adjuvant and palliative care settings. This inadequate access to radiotherapy may not be unconnected to the high population of Nigeria - with over 200 million people who depend on only six low capacity radiotherapy centers spread across the country. As such, the radiotherapy machines are overstretched frequently developing faults with associated long waiting lists and patient frustration [18,19]. Consequently, many patients fail to access radiotherapy as and when needed. Surprisingly, similar scenarios (though on a lesser scale) have been reported by researchers in some developed countries [20]; again emphasizing the need for medical systems improvement, especially as concerns cancer diagnostics, and treatment.

Surgery and or radiotherapy are followed by systemic adjuvant therapy, because in apparently localized tumors, there may be micro metastases. Systemic adjuvant therapy may include chemotherapy, hormonal therapy and various forms of targeted biologic therapy, and the choice depends on specific characteristics of the tumor such as hormone receptors and HER2/neu status, as well as the presence of metastatic disease.

Most patients with good performance status benefit from cyclical combination chemotherapy in the neoadjuvant or adjuvant setting and considering the late presentation in our environment; many patients require neoadjuvant chemotherapy to downstage their tumors [21,22]. The regimen of choice depends on several factors, including cost and availability of the drugs, especially in resource-poor settings.

In this study, 89 (80%) patients were eligible for chemotherapy. However, only 53 (60%) of them completed chemotherapy. The remaining 36 (40%) patients who were eligible for chemotherapy did not receive it because they could not afford it. This figure is rather high considering the pivotal role of chemotherapy in cancer management, both at the induction and maintenance phases of care. In Nigeria, the absence of health insurance cover for chemotherapeutic agents means that patients have to pay out of pocket [23-25]. This finding is congruent with many studies from the region which show affordability as the main barrier to accessing chemotherapy and other treatment modalities; resulting in disparities in survival outcomes when compared with patients from the western world [26,27].

Hormonal therapy is another modality of breast cancer care. It is offered to patients with hormone receptor (ER and or PR) positive tumor [28,29]. There are various hormonal agents, and a single agent is usually given for a protracted period of about five years or more unless there is disease progression or relapse, and then they are switched to another [30,31].

In our study, 34 patients received hormonal therapy, although only 25 had hormone receptor-positive tumors. This empirical administration of hormonal agents (Tamoxifen) to patients, especially those in the postmenopausal period whose hormonal status is unknown, is common in our setting [29]. The empirical use of Tamoxifen is done to leverage on other estrogen-receptor-independent mechanisms of action of the drug. Studies have shown that five to ten percent of estrogen receptor-negative cancers show sensitivity to Tamoxifen treatment [32].

Targeted biologic therapy using monoclonal antibodies may be given to target specific molecules expressed in tumors and is the current

focus of breast cancer research [33]. They may be given concurrently with chemotherapy [34]. None of the patients in this study had access to targeted biologic therapy as the cost of the biologic agents were unaffordable for our patients.

Palliative care is usually offered to patients with advanced breast cancer that is not amenable to any of the treatment modalities discussed above. It involves symptomatic management of the physical manifestations of advanced breast cancer that have the potential to undermine the quality of life or negatively impact psychosocial well-being [35]. Palliative care requires an interdisciplinary approach with a strong emphasis on the assessment of needs and anticipated needs, patient expectations, skilled therapeutics, and commitment to continuity of care. In this study, 19% of patients presented with advanced disease and poor clinical condition barring them from chemotherapy and other modalities of care. This group of patients were offered palliative care.

## 5. CONCLUSION

This study examined access to the various components of breast cancer care within two tertiary health care centers in the Jos metropolis. Some of the barriers to accessing breast cancer care encountered in our study include; the unavailability of breast cancer diagnostics (e.g. immunohistochemistry), the unaffordability of chemotherapeutic agents due to inadequate health insurance coverage, and limited access to radiotherapy. These barriers emphasize the need for an improvement of Nigeria's medical systems, especially as regards breast cancer care.

## CONSENT

Patients' informed and written consent have been obtained and preserved by authors.

## ETHICAL APPROVAL

We obtained ethical approval from the Institutional Research Ethical Committee of the Jos University Teaching Hospital.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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