# Sociodemographic Characteristics and Histologic Subtypes of Breast Cancer at a Tertiary Hospital in North Central Nigeria

DR. SANI A.S*(MBBS, MPA, FWACS, FIMC),[1,2] PROFESSOR OLUWOLE O.P(MBBS,FMCPath)[3]

[1] *Division of General Surgery,Breast & Endocrine Surgery Unit,Department of Surgery, University of Abuja Teaching Hospital,Gwagwalada, Abuja, F.C.T., Nigeria &*[2] *Department of Surgery, College of Health Sciences,University Of Abuja,Abuja, Nigeria.*
[3] *Department of Histopathology and Forensic Medicine,College of Health Sciences,University of Abuja,Abuja, Nigeria.*
*Corresponding Author.*

## Abstract

***Background:****Breast cancer is one of the most challenging diseases affecting mankind. Morbidity and mortality from the disease have remained significantly high particularly in Sub-Saharan Africa, due to delay in presentation and poor access to cancer care. Nigeria, the most populous black nation in the world, is confronted with a rising incidence of breast cancer. Among Nigerian women, breast cancer generally is diagnosed at an advanced stage, and survival is very poor.Factors contributing to poorer outcome in developing world includes poverty, reduced public awareness, cultural beliefs, practices leading to late presentation, inadequate medical facilities and human resources.Targeted therapies have remained difficult due to tumor biology, differentiation, heterogeneity, and varying molecular subtypes.*

***Materials and Methods:****A retrospective study was undertaken to explore the sociodemographic and histologic subtypes of breast cancer at the University of Abuja Teaching Hospital, Gwagwalada, Abuja, Federal Capital Territory, in Nigeria.The case notes and admission records of consecutive patients with histologically diagnosed breast cancer, from the cancer registry of the institution between 1st January 2014 and 31st December 2019 were reviewed.*

***Results:****A total of 125 patients records that met the criteria for inclusion were evaluated.The study population had a mean age of 44.50±10.72 years with the majority in the 4th & 5th decade of life. Invasive ductal carcinoma accounted for the commonest histologic subtype of breast cancer 99 (79.2%), and a majority of the women were triple-negative.*

***Conclusion:****The majority were premenopausal women in their 4th and 5th decade of life, with predominantly invasive ductal carcinoma. Lack of facilities for immunohistochemistry makes patients' characterization difficult and negates targeted therapies or personalized treatment models for breast cancer.Incorporation of histology and immunohistochemistry assay in the spectrum ofNational Health Insurance Scheme (NHIS) investigations will reduce out-of-pocket expenditures by patients having breast cancer.*

***Keywords****: Breast cancer, histologic subtypes, receptor status.*
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## I. Background

Breast cancer is one of the most challenging diseases affecting mankind. Morbidity and mortality from the disease have remained significantly high particularly in Sub-Saharan Africa, due to delay in presentation and poor access to cancer care.

Nigeria, the most populous black nation in the world, is classified by the World Bank as a Low Middle Income Country (LIMC) with a rapidly growing economy. [1] The country is currently undergoing an epidemiologic transition with an aging population and a gradual decline in mortality, which has brought about an increased incidence of non-communicable diseases like cancer of the breast. [2] Recent findings noted an increase in the incidence of breast cancer in Nigeria.

Among Nigerian women, breast cancer generally is diagnosed at an advanced stage, and survival is very poor. [3,4,5]

It is estimated that 1 in 8 women will be diagnosed with invasive breast cancer in their lifetime and the risk of dying from the disease is 2.6% in the USA. [6] It's reckoned with as a common cause of cancer mortality among women in Nigeria. Factors contributing to poorer outcome in developing world includes poverty, reduced public awareness, cultural beliefs, practices leading to late presentation, inadequate medical facilities and human resources. [7]

Targeted therapies have remained difficult due to tumor biology, differentiation, heterogeneity, and varying molecular subtypes.

## II.    Material and Methods

Abuja is a metropolitan city. University of Abuja Teaching Hospital, Gwagwalada, Abuja, is a Tertiary Hospital in North Central Nigeria, located in a suburb of the Federal Capital Territory (FCT) and serve patients in semi-urban, urban and rural communities of FCT, and environs, namely Niger, Kogi, Nasarawa, and southern part of Kaduna states.

Breast and Endocrine Surgery Clinics, is a subspecialty clinic of the Division of General Surgery, at the University of Abuja Teaching Hospital, Gwagwalada, Abuja, Federal Capital Territory, where the study was carried out.

**Objectives of the Study:** To determine the histologic subtypes of breast cancer in our institution

**Study Design:** A retrospective study

**Study Location:** The study was carried out at Breast and Endocrine Surgery Clinics, a subspecialty clinic of the Division of General Surgery, at the University of Abuja Teaching Hospital, Gwagwalada, Abuja, Federal Capital Territory, North Central region, in Nigeria.

**Study duration:** 1st January 2014 and 31st December 2019.

**Sample size:** 125 patients.

**Subjects & selection method:** This research was undertaken to explore the sociodemographic and histologic subtypes of breast cancer in the institution, using a structured questionnaire.

The case notes and admission records of consecutive patients with histologically diagnosed breast cancer, from the cancer registry of the institution between 1st January 2014 and 31st December 2019 were reviewed.

**Inclusion criteria:**
1.      Patients aged18years and above
2.      All patients with histologically diagnosed breast cancer
3.      Patient withimmunohistochemistry

**Exclusion criteria:**
1.      Patients under 18years
2.      Patients with clinical suspicion of breast cancer
3.      Patients without results of immunohistochemistry

**Statistical analysis:** Statistical analysis was performed using the SPSS, v. 21 for Windows (IBM SPSS Statistics, IBM Corporation, USA). Statistical significance is set at a *P*-value of < 0.05. Descriptive and inferential statistics using frequencies, percentages, a mean, and standard deviation of variables are presented in tabular forms.

**Ethics:** This research was carried out following the Declaration of Helsinki of the World Medical Association and received ethical approval from the Health Research Ethics Committee of the University of Abuja Teaching Hospital, Gwagwalada, Abuja, Federal Capital Territory.

## III.    Results

The study population had a mean age of 44.50±10.72 years with the majority in the 4th & 5th decade of life (Table 1). Only one (1) male was diagnosed with breast cancer in the study with M: F of 1:124. Invasive ductal carcinoma accounted for the commonest histologic subtype of breast cancer 99 (79.2%), and a majority of the women were triple-negative (Table3&4). However, only 60.0% of the patient did their hormone receptors, while the remaining 40.0% could not. All the patients (100.0%) didn't do Ki-67 assay, due to lack of funds or unavailability of facilities for immunohistochemistry.

**Table 1:** Sociodemographic characteristics of patients (n = 125)

| Variables | Frequency (N) | Percentage (%) |
|---|---|---|
| **Age** | | |
| 10-19 | 0 | 0.0 |
| 20-29 | 5 | 4.0 |
| 30-39 | 37 | 29.6 |
| 40-49 | 46 | 36.8 |
| 50-59 | 26 | 20.8 |
| 60-69 | 6 | 4.8 |
| ≥70 | 5 | 4.0 |
| **Sex** | | |
| Male | 1 | 0.8 |
| Female | 124 | 99.2 |
| **Educational background** | | |
| Primary | 0 | 0.0 |
| Secondary | 6 | 4.8 |
| Higher education | 36 | 28.8 |
| Tertiary | 15 | 12.0 |
| No formal education | 4 | 3.2 |
| Not available | 64 | 51.2 |
| **Occupational status** | | |
| Trader | 42 | 33.6 |
| Housewife | 39 | 31.2 |
| Civil servant | 31 | 24.8 |
| Artisan | 4 | 3.2 |
| Banker | 2 | 1.6 |
| Administrator | 2 | 1.6 |
| Farmer | 1 | 0.8 |
| Unemployed | 4 | 3.2 |
| **Marital status** | | |
| Single | 14 | 11.2 |
| Married | 109 | 87.2 |
| Divorced | 2 | 1.6 |
| **Religion** | | |
| Christianity | 101 | 80.8 |
| Islam | 24 | 19.2 |

**Mean age of patients   44.50 ± 10.72 years**

**TABLE 2:** Frequency distribution of histologic subtypes

| Histologic subtype(s) | Frequency (N) | Percentage (%) |
|---|---|---|
| Invasive ductal carcinoma | 99 | 79.2 |
| Medullary carcinoma | 10 | 8.0 |
| Ductal carcinoma in-situ | 8 | 6.4 |
| Invasive lobular carcinoma | 6 | 4.8 |
| Mixed ductal & lobular Carcinomas | 1 | 0.8 |
| Sarcoma | 1 | 0.8 |
| Total | 125 | 100 |

**Table 3:** Hormone receptor status (Immunohistochemistry)

| Variables | Frequency (N) | Percentage (%) |
|---|---|---|
| **Estrogen** | | |
| Positive | 19 | 15.2 |
| Negative | 56 | 44.8 |
| Not done | 50 | 40.0 |

| | | | | |
|---|---|---|---|---|
| **Progesterone** | | | | |
| Positive | 18 | | 14.4 | |
| Negative | | 57 | | 45.6 |
| Not done | | 50 | | 40.0 |
| **Her-2/neu receptor** | | | | |
| Positive | 8 | | 6.4 | |
| Negative | | 67 | | 53.6 |
| Not done | | 50 | | 40.0 |
| **Triple negative** | | | | |
| Yes | 52 | | 41.6 | |
| No | 23 | | 18.4 | |
| Not done | | 50 | | 40.0 |
| **Ki67** | | | | |
| Yes | 0 | | 0.0 | |
| No | 0 | | 0.0 | |
| Not done | | 125 | | 100 |

## IV. Discussion

The most significant finding in this study is the age of occurrence of breast cancer, which is 44.50 years, a decade younger than the western world; where 50% of cases occurred in the age group 50-65years and 30% occurring over the age of 70 years.The implication is that very active, economically viable, and highly reproductive women are ravaged by breast cancer, which affects productivity.

This study revealed invasive ductal carcinoma (IDC) as the commonest histological type, accounting for 99 (79.2%) in our institution, followed by Medullary carcinoma 10 (8.0%). Others were ductal carcinoma in-situ 8(6.4%), invasive lobular carcinoma 6(4.8%), mixed ductal & lobular carcinomas 1(0.8%), and sarcoma 1(0.8%) respectively. Similar findings of IDC occurring most commonly were noted by several scholars. [8,9,10,11,12,13]It is sub-classified as either well-differentiated (grade 1), moderately differentiated (grade 2), or poorly differentiated (grade 3) according to the levels of nuclear pleomorphism, glandular/tubule formation, and mitotic index. [14]

It is worrisome that only 60.0% of the patients' population did immunohistochemistry. Molecular biomarkers such as Estrogen Receptor (ER), Progesterone Receptor (PR), and Human Epidermal Growth Factor Receptor 2 (HER-2/neu) status have revolutionized the management of breast cancer. The utility of ER, PR, and HER-2/neu [15] is well accepted for IDC and it is recommended that their status be determined on all invasive carcinomas. [16] These molecular biomarkers have the potentials for guiding clinical decisions. [17] For instance, the status of these markers helps determine which patients are likely to respond to targeted therapies (i.e., tamoxifen or aromatase inhibitors for $ER^+/PR^+$ patients and trastuzumab, pertuzumab, or lapatinib for HER-2/neu patients). [18,19] Targeted therapies have substantially improved cancer care and patients' survival.

A significant population of women in the research had Triple-Negative Breast Cancer (TNBC), due to the absence of estrogen receptor, progesterone receptor, and human epidermal growth factor receptor 2. TNBC accounts for 12–20% of all breast cancer cases and is characteristically the most aggressive subtype. Other features include younger age of onset, increased ability to spread, higher rate of recurrence of tumor, and mortality. [20,21]

Ki-67 is a neuronal marker of cell cycling and proliferation. Overall, TNBC expresses a high level of Ki-67 as a reflection of the high proliferation rate. [22]

## V. Conclusion

The majority were premenopausal women in their 4th and 5th decade of life, with predominantly invasive ductal carcinoma. Lack of facilities for immunohistochemistry makes patients' characterization difficult and negates targeted therapies or personalized treatment models for breast cancer.

Incorporation of histology and immunohistochemistry assay in the spectrum of National Health Insurance Scheme (NHIS) investigations will reduce out-of-pocket expenditures by patients having breast cancer.

Pharma industries should invest in the procurement of equipment used for immunohistochemistry against the backdrop of corporate social responsibilities to alleviate the suffering of persons afflicted with breast disease(s)and improve the management of breast cancer.

**Limitations of the study**
1. Hospital-based records
2. Single-center Study and

3. Shortcomings of a retrospective study

## Acknowledgment

## Disclosure and conflict of interest

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