

# Breast Lesions in a District Hospital: Demographic and Histopathologic Characteristics

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## Abstract

**Background and Aim:** Breast cancer is increasingly the most common malignancy among Nigerian women. This study documents the demographic and histopathologic characteristics of breast lesions in a district hospital over a 5-year period. **Patients and Methods:** Data were collated from patients' request forms and duplicate copies of histology reports of all cases seen under the study period. **Results:** Breast lesions represented 13% of all histologically diagnosed lesions during the period of the study. Almost 98.6% of these breast specimens were received from females, with a female-to-male ratio of 58.9:1.0. The overall age range of the patients seen was from 10 to 96 years, with a mean of  $33.3 \pm 13.1$  years at the time of presentation. There were 37 (4.4%) nonneoplastic breast lesions, 547 (65.3%) benign breast neoplasms (BBNs), and 254 (30.3%) malignant breast neoplasms (MBNs). The peak age incidence of MBNs was seen in the fifth decade (33.1%). The most common BBN was fibroadenoma (54.5%), followed by fibrocystic change (29.3%). The most common MBN was invasive ductal carcinoma (84.3%), followed by lobular and mucinous carcinoma, each accounting for 4.3%. About 77.1% of the breast carcinomas were Grade II. **Conclusion:** Breast lesions are common in our setting, strikingly more common in females, predominantly benign in nature with fibroadenoma which peaks in the 20–29 years age group being the most common variety. Invasive ductal carcinoma is the most common malignancy, affecting more women in their 40s with one of every three cases seen in women before their 40<sup>th</sup> birthday.

**Keywords:** Benign, breast lesion, cancer, fibroadenoma, invasive ductal carcinoma

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## INTRODUCTION

The breast (mammary gland) is the major differentiator of mammals from other animals.<sup>[1]</sup> In the mammalian humans, it is most developed and visible in females where it serves as a source of complete nutrition for the developing infant and is considered a symbol of beauty and femininity with unique social, cultural, psychosocial, and sexual attributes.<sup>[1-3]</sup> The breast is afflicted by several diseases, including developmental, inflammatory, and neoplastic.<sup>[1-4]</sup> While benign breast neoplasms (BBNs) are usually more common, breast cancer is the most common nonskin cancer and the leading cause of cancer-related deaths in women after lung cancer in the world.<sup>[1-5]</sup> Initially thought of as a disease of the developed countries, many reports have shown breast cancer to be common with increasing incidence and mortality in Africa in general and Nigeria in particular.<sup>[5-18]</sup> It is now regarded as

the most common malignancy among Nigerian women, with about a fourfold rise in its yearly incidence in a decade from 33.6/100,000 in 1992 to 116/100,000 in 2001.<sup>[6,8,9]</sup> Although not fully understood, changing demography (increasing older population), improving socioeconomic conditions with consequent westernization of lifestyles, delayed childbearing age, low parity, increasing breast health awareness, improving diagnostic capacity, and reporting have been proposed as the rationale for the rising incidence of breast cancer in Nigeria.<sup>[6,8,15]</sup> Breast cancer is thus rightfully considered a public health problem with several screening modalities to

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detect early breast cancer, scores of ongoing research targeting different aspects of the disease as well as many breast cancer awareness campaigns, nationally and internationally.

Pain, palpable lump, nipple discharge, or lumpiness – singly or in combination – represent the common presentation of breast diseases, while self or clinically detected mass is the most common presentation of breast cancer.<sup>[1-3]</sup> Hence, a breast lump in a female of any age causes significant anxiety, warranting hospital visits to confirm or exclude breast cancer. This study reviews the demographic and histopathological characteristics of breast lesions seen at a pathology laboratory of a district hospital in North Central Nigeria and compares the findings with similar studies in Nigeria and elsewhere.

### PATIENTS AND METHODS

This was a retrospective analysis of all breast lesions seen at the pathology unit of Asokoro District Hospital, Asokoro, Abuja, Nigeria, over a 5-year period, from January 1, 2015, to December 31, 2019. Request forms and duplicate copies of all histologically diagnosed breast lesions during the study period were retrieved and the demographic and histopathologic data were collated. The corresponding slides were then retrieved and reviewed. New slides were made from formalin-fixed, paraffin-embedded blocks where such slides were missing or faded. Where the above data or slides or blocks could not be found, those were excluded from the study. All biopsies had been fixed in 10% neutral buffered formalin. The tumors were classified according to the 2012 WHO International Classification of breast tumors.<sup>[19]</sup> The malignant breast tumors were graded according to the Nottingham grading system.<sup>[20]</sup> All data were entered into a Microsoft Excel worksheet utilizing the 2016 Microsoft Excel software program (Microsoft Corporation, NY, USA) and analyzed. Continuous variables were summarized using range and mean ± standard deviation, while categorical variables presented as percentage frequencies were determined using descriptive statistics. Data were displayed using tables and charts.

### RESULTS

Breast lesions constituted 838 of the 6440 (13%) cases of all histologically diagnosed lesions during the period of the study. Eight hundred and twenty-four (98.6%) of these breast specimens were received from females, with a female-to-male ratio of 58.9:1.0. The lesions were seen in the right breast in 377 (45.0%) cases, the left breast in 355 (42.4%) cases, and both breasts in 58 (6.9%) cases, while the laterality was unstated in 48 (5.7%) cases. The overall age range of the patients seen was from 10 to 96 years, with a mean of 33.3 ± 13.1 years at the time of presentation. There were 37 (4.4%) nonneoplastic breast lesions, 547 (65.3%) BBNs, and 254 (30.3%) malignant breast neoplasms (MBNs) [Table 1]. The age range of patients with BBNs was from 10 to 96 years, with a mean of 27.6 ± 10.1 years at the time of presentation. The peak incidence of BBNs was seen in the 20–29 years age group followed by the 30–39 years’

age group. For the patients with MBNs, the age range was from 17 to 80 years, with a mean of 44.1 ± 11.4 years at presentation. The peak age incidence of MBNs was seen in the fifth decade (33.1%), followed by the fourth decade. The age distribution of the benign and malignant lesions is shown in Table 2. The most common BBN was fibroadenoma (54.5%), followed by fibrocystic change [Table 3]. The most common MBN was invasive ductal carcinoma (84.3%), followed by lobular and mucinous carcinoma, each accounting for 4.3% [Figure 1]. The microscopic appearance of fibroadenoma and invasive ductal carcinoma is shown in Figures 2 and 3, respectively. Two hundred and nineteen (86.2%) MBNs were graded according to the Nottingham grading system and revealed Grade II in 77.1% cases, while Grades III and I made up 19.6% and 3.3% cases, respectively.

**Table 1: Summary of clinicopathologic characteristics of breast lesions**

Characteristics	Descriptions
Number of breast lesions	838
Age	
Range	10–96
Mean±SD	33.3±13.1
Sex, n (%)	
Female	824 (98.6)
Male	14 (1.4)
Laterality, n (%)	
Right breast	377 (45.0)
Left breast	355 (42.4)
Bilateral	58 (6.9)
Unstated	48 (5.7)
Nature of lesion, n (%)	
Nonneoplastic lesion	37 (4.4)
Benign neoplasm	547 (65.3)
Malignant neoplasm	254 (30.3)
Grades, n (%)	
Grade I	7 (3.3)
Grade II	169 (77.1)
Grade III	43 (19.6)

SD: Standard deviation

**Table 2: Age distribution of breast lesions**

Age groups	Nonneoplastic lesions (%)	Benign neoplasms (%)	Malignant neoplasms (%)
0–9	0	0	0
10–19	3 (8.1)	131 (23.9)	1 (0.4)
20–29	10 (27.0)	201 (36.7)	19 (7.5)
30–39	17 (45.9)	122 (22.3)	78 (30.7)
40–49	3 (8.1)	66 (12.1)	84 (33.1)
50–59	0	23 (4.2)	48 (18.9)
60–69	3 (8.1)	2 (0.4)	14 (5.5)
70–79	0	1 (0.2)	9 (3.5)
80–89	0	0	1 (0.4)
90–99	1 (2.7)	1 (0.2)	0
Total	37 (4.4)	547 (65.3)	254 (30.3)

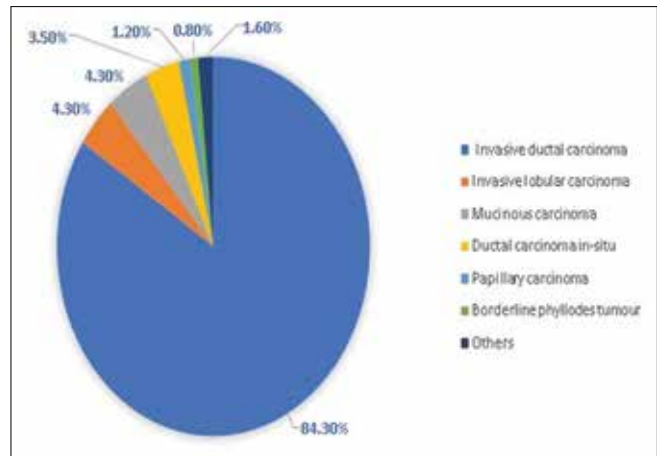
**Table 3: Frequency distribution of benign neoplasms**

Histologic categories and specific subtypes	Frequency (%)
Nonproliferative epithelial lesions	
Fibrocystic change	160 (29.3)
Tubular adenoma	26 (4.8)
Lactational adenoma	4 (0.7)
Proliferative epithelial lesions without atypia	
Intraductal papilloma	11 (2.0)
Sclerosing adenoma	2 (0.4)
Flat epithelial hyperplasia	1 (0.2)
Proliferative epithelial lesions with atypia	
Atypical ductal hyperplasia	3 (0.5)
Fibroepithelial tumors	
Fibroadenoma	298 (54.5)
Benign phyllodes tumor	26 (4.8)
Mesenchymal tumors	
Lipoma	5 (0.9)
Dermatofibroma	2 (0.4)
Tumor of the male breast	
Gynaecomastia	9 (1.5)
Total	547 (100)

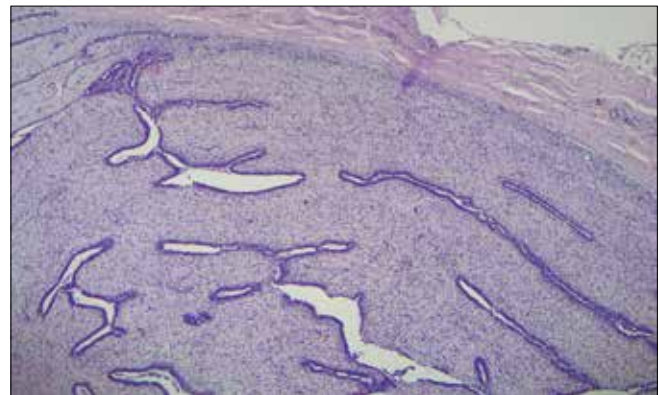
## DISCUSSION

Breast diseases represented 13% of the workload in our pathology unit which is the only pathology service laboratory for all the 13 government-owned general hospitals under the administration of the Federal Capital Territory Administration. This proportion is higher than the 8.1%, 7.1%, and 3.5% reported by Eke *et al.*,<sup>[16]</sup> in Makurdi, Isah *et al.*,<sup>[21]</sup> in Sokoto, and Yusufu *et al.*,<sup>[22]</sup> in Zaria, respectively, but compares favorably with the 16% reported by Nwafor and Udo,<sup>[23]</sup> in Uyo. Our figure is, however, lower than 26% reported by Nwafor and Keshinro<sup>[24]</sup> and 22.3% recorded by Aligbe and Ugiagbe,<sup>[25]</sup> both from their experience in private practice in Lagos and Benin City, Nigeria, respectively.

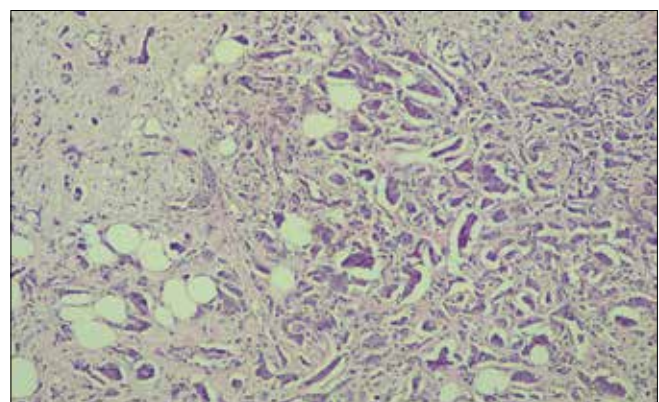
Male breast lesions are relatively rare with male breast cancer (MBC), accounting for <1% of all cases.<sup>[1,2,4]</sup> This study recorded only 14 (1.4%) cases of breast diseases in males, with a striking female-to-male ratio of 58.9:1.0. This ratio is consistent with reports from within and outside Nigeria.<sup>[12,16,21-29]</sup> Our male affection rate of 1.4% is congruent with 1.3% reported by Ogbuanya *et al.*,<sup>[27]</sup> in Abakaliki, but lower than other reports from other Nigerian series with reported rates of 2.0%–3.5%<sup>[16,22,24-26]</sup> and outside Nigeria with a report of 3% in an Indian study<sup>[28]</sup> and 9.3% in a Saudi study.<sup>[29]</sup> Consistent with most other series,<sup>[16,22-25]</sup> gynaecomastia (64%,  $n = 9$ ) was the most common lesion seen in males in our study. It is noteworthy that Ibrahim *et al.*,<sup>[12]</sup> in Kano, and Ogbuanya *et al.*,<sup>[27]</sup> in Abakaliki, Nigeria, documented MBC as the most common breast disease in males. A case of MBC representing 0.4% of the cancers in this index study is in accordance with figures from western countries<sup>[1-4]</sup> and the report from Ile-Ife<sup>[9]</sup> but markedly lower than figures from most Nigerian studies with reported rates of 2% to 9%.<sup>[8,10,12,24-26,30-33]</sup> The exact



**Figure 1:** Histologic subtypes of malignant breast lesions. N.B: Others included a case each of adenoid cystic carcinoma, invasive cribriform carcinoma, dermatofibrosarcoma protuberans, and malignant phyllodes tumor



**Figure 2:** Fibroadenoma, intracanalicular pattern – fibromyxoid stroma and compressed glandular spaces (H and E, ×100)



**Figure 3:** Invasive ductal carcinoma – ragged nests, solid sheets, and single strands of atypical cells invading fibrofatty tissue stroma (H and E, ×40)

reason for the high incidence of MBC in Nigeria and Africa is unknown. However, the high prevalence of hepatitis (B and C) and schistosomiasis, which are associated with liver cirrhosis and so high circulating levels of estrogen, the major stimulant

for the growth of breast tissue, consequently, increasing the risk of MBC as well as the relatively higher incidence of common testicular causes of androgen deficiency like mumps, undescended testes, and torsion in the Sub-Saharan Africa region have been advanced as possible explanation.<sup>[31]</sup> Furthermore, unlike studies from Nigeria and elsewhere which reveal invasive ductal carcinoma as the most common cancer in male, affecting them commonly from the sixth decade of life,<sup>[1-3,24-26,30-33]</sup> our only case is a rare form of breast cancer, cribriform carcinoma, in a teenager. It should be noted that Sheshe and Imam<sup>[34]</sup> and Yusuf *et al.*<sup>[35]</sup> reported similar rare cases of secretory carcinoma in a 20-year-old male and giant malignant phyllodes tumour in an 18-year-old female, both in Kano, Nigeria.

As is documented globally and in local literatures,<sup>[12,16,21-28,36-38]</sup> BBNs outnumbered MBNs in this review. BBNs represented 65.3% with BBN-to-MBN ratio of 2.3:1. This proportion is in consonance with the 66.1% reported in Kano,<sup>[12]</sup> higher than reports from Ghana,<sup>[38]</sup> Uyo,<sup>[23]</sup> Makurdi,<sup>[16]</sup> and Abakaliki<sup>[27]</sup> with a recorded range of 48%–56.3%, and lower than the reports from Zaria,<sup>[22]</sup> Sokoto,<sup>[21]</sup> Lagos,<sup>[24,34]</sup> Benin City<sup>[37]</sup> and 89.6% Ibadan<sup>[26]</sup> with reported range of 71.3%–89.6%. This differing proportions of the predominant BBNs reflect the variations in the actual incidence of these lesions that may be due to differential study design, ethnic diversity, access to health facility, and awareness.<sup>[16,27]</sup> BBNs were seen more commonly in the third decade with a mean age at presentation of 27.6 years [Table 2] which agrees with the published literature by researchers in Nigeria.<sup>[12,16,21,24,27,36,37,39-42]</sup> However, our finding of 19 cases of MBNs [Table 2] in this age group means that clinicians should do all that is needed to properly evaluate such breast complaints, utilizing the triple assessment approach.<sup>[4]</sup>

Fibroadenoma [Figure 2] was the single most common entity (35.5%) and the most common BBN (54.5%) in this work. All other recent workers<sup>[12,16,21,24,36,39-42]</sup> in Nigeria recorded fibroadenoma as the most frequent BBN except Jeje *et al.*<sup>[37]</sup> who reported fibrocystic change as the most common BBN. The exact reason why Jeje *et al.*<sup>[37]</sup> data buck the trend may not be known, but it can be surmised that its small sample size ( $n = 189$ ) and that it was from a private facility, generally viewed as expensive, may have imposed a patient selection bias. The documented percentage proportion of fibroadenoma in selected works across Nigeria ranges from 43.1% to 76.1%.<sup>[16,21-27,40-42]</sup> Fibroadenomas are biphasic neoplasms with stromal and epithelial components that present clinically as well circumscribed, usually multiple and bilateral rubbery nodules in young women.<sup>[1-3]</sup> The epithelial component is estrogen sensitive, increases in size during puberty, pregnancy, and lactation, with the resultant size increase frequently associated with necrosis, dystrophic calcification, and inflammation which causes a clinical presentation that raises the suspicion of malignancy.<sup>[2]</sup> Although a mild risk of cancerous transformation is associated with fibroadenoma due to its proliferative epithelial element, this risk is seen in those

with complex features, namely sclerosing adenosis, epithelial calcifications, papillary apocrine change, or cysts larger than 0.3 cm.<sup>[2,19]</sup>

Fibrocystic change, an entity which comprises a group of nonproliferative morphologic changes, is the second most common BBN in our study like other recorded works<sup>[12,16,21,24,39-42]</sup> in Nigeria, but the report by Jeje *et al.*<sup>[37]</sup> highlighted above where it was the most common BBN. It could mimic carcinoma clinically and radiologically due to calcifications and inflammatory changes caused by some of its morphologic elements.<sup>[2]</sup> Other BBNs were relatively rare, individually or as a group in our review [Table 3], with a frequency similar to other reports.<sup>[12,39-42]</sup> Comparative to the rate of 3.3% reported in Calabar<sup>[39]</sup> and 2.3% in Abakaliki,<sup>[27]</sup> it is noteworthy that proliferative lesions (intraductal papilloma, atypical ductal hyperplasia sclerosing adenosis, and flat epithelial hyperplasia) in this study comprised 3.1% of BBNs. These lesions are believed to carry a relative risk for developing invasive breast carcinoma of 1.5% to 2%.<sup>[2,19]</sup>

As with studies across Nigeria, MBNs were mostly adenocarcinomas [Figure 1] and accounted for 30.3% of all breast diseases seen in this study. The reported proportions of breast carcinoma in Nigerian studies ranged from 21.3% to 44.3%.<sup>[12,16,21-25,27,36,37,40-43]</sup> The higher rates reported by Nwafor and Udo, in Uyo (44.3%),<sup>[23]</sup> Ogbuanya *et al.*, in Abakaliki (43.7%),<sup>[27]</sup> and Eke *et al.*, in Makurdi (43.6%)<sup>[16]</sup> are in the minority, and the reason is not immediately apparent. Irabor *et al.*<sup>[26]</sup> documented an unusually low proportion of 10.6%. This may be due to the design of their study that examined only breast lumps from an arm of their general surgery unit.

The carcinomas affected women predominantly in the fifth decade<sup>[40-49]</sup> of life with a mean of 44.1 years at diagnosis. The index age distribution is in conformity with majority of the documented works in Nigeria<sup>[6,8-10,12,16,23-27,37,31]</sup> and Ghana.<sup>[48]</sup> The peak age of incidence was reported a decade earlier in Makurdi<sup>[16]</sup> and Benin City<sup>[36]</sup> and a decade later in Sokoto.<sup>[21]</sup> Our finding confirms the observation that breast cancer occurs one to two decades earlier in women of African origin.<sup>[2,4,44-50]</sup> This study shows a worrisome pattern already reported by both Ogbuanya *et al.*<sup>[23]</sup> in Nigeria that 1 of every 3 cases of breast cancer affects a woman before she is 40 years of age [Table 2]. Biologic, genetic, and possibly changing environmental factors may be responsible for the early onset of carcinogenic processes in our women.<sup>[44-48]</sup> While little can be done about oncogenic processes, a lot more need to be done to improve awareness and education on how to perform self-breast examination, encourage patients to report early for clinical breast examination on discovering a lump and expand capacity to screen these lumps to diagnose these cancers early and so improve the survival rates of our young women.

Invasive ductal carcinoma (84.3%) [Figure 3] was the prevalent histologic subtype of breast cancer in our study and this is consistent with data from Nigeria,<sup>[5,6,8-10,12,16,21-27,36,37,43]</sup>

Africa,<sup>[38,48]</sup> and the world.<sup>[1,2,4,19,20,28,29]</sup> It accounts for 59.2%–95.8% in published Nigeria series<sup>[12,16,21,22,27]</sup> and Africa.<sup>[48]</sup> The relatively less aggressive subtypes were fewer with invasive lobular and mucinous carcinoma being distant second after invasive ductal carcinoma [Figure 1].

Breast cancer grade is one of the Category I prognostic factors according to the College of American Pathologists which have demonstrated reproducible significant correlation with patients' outcomes and utility in their clinical management.<sup>[43]</sup> Grade II cancers were the most common in this index study (77.1%) [Table 1]. This finding mirrors the works of Nwafor and Keshinro,<sup>[24]</sup> in Lagos, and Mandong *et al.*,<sup>[45]</sup> in Jos, Nigeria, who reported prevalent Grade II tumors. This finding, however, contrasts with the reported predominance of Grade III cancers by Gogo-Abite and Nwosu,<sup>[46]</sup> in Port Harcourt, Usman *et al.*,<sup>[47]</sup> in Kano, Nigeria, as well as Bewtra<sup>[48]</sup> in Ghana, and the finding by Imam *et al.*,<sup>[12]</sup> who reported Grade I tumors as the majority in their study. However, when taken together, the high-grade tumors (Grades II and III) were more common. This pattern of histologic grades of breast carcinoma across Nigeria and Africa is consistent with the observation that women of African ancestry often have higher grade, more aggressive breast carcinoma when compared with Caucasian women matched for age, tumor size, and stage.<sup>[49,50]</sup> It has been proposed that this is likely due to the biology of the tumor, paucity of screening and early detection in African women, and poor utilization of screening modalities among African–American women.<sup>[48-50]</sup>

This study is not without limitations: Its retrospective nature means that the demographic details are as accurate as at the time of their initial recording. Furthermore, it is a single hospital-based study, and so, some details may not completely reflect the reality in the population, hence, the need for a multicenter coordinated population study. Nonetheless, we determine that overall, the data presented are representative with important clinical and scientific implications.

## CONCLUSION

Breast lesions are common in our setting, strikingly more common in females, predominantly benign in nature with fibroadenoma which peaks in the 20–29 years age group being the most common variety. Invasive ductal carcinoma is the most common malignancy, affecting more women in their 40s, with one of every three cases seen in women before their 40<sup>th</sup> birthday. This clinicopathological profile of our data is broadly congruent with previous accounts across Nigeria and Africa. The imperatives of systematic national breast cancer screening and awareness programs to help early detection and improve outcomes of this disease in our young women are highlighted.

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## Conflicts of interest

There are no conflicts of interest.

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