The Pathology of Breast Biopsies in a Sample of Nigerian Patients: Review and Analysis

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Abstract

Background: Histological tissue diagnosis of breast lumps plays an important role in patient management. Almost all breast pathology studies in Nigeria were conducted in government owned health facilities. This study aims to describe the histopathological pattern and of breast biopsies seen in Me Cure Healthcare Limited, a privately owned diagnostic centre. **Methods**: Histopathological reports of all breast specimens received and processed from August 2009 to December 2013 were retrieved from a computer database and entered into an Excel sheet and analyzed using SPSS version 17. Histological features were classified using 2003 WHO classification of breast diseases. **Results**: A total of 1205 breast specimens were reviewed. This formed 26% of 4,642 histology specimens received in the pathology laboratory. The youngest patient was 11 years and the oldest 88 years with a mean of 31.7 years and SD ±13.12. Females accounted for 97.8% with a female to male ratio of 43.4:1. The age group 20-29 years were most involved (n=362; 30%). Malignant lesions accounted for 21.3% while benign lesions accounted for 78.7%. Fibroadenoma was the commonest benign lesion and accounted for 61.7% of all benign lesions with a mean age of cases been 24,6 years. Age groups 40-49 and 30-39 years accounted for most malignant lesions (33.5% and 27.6% respectively) with invasive ductal carcinoma been the commonest. **Conclusion**: Benign breast lesions are more common generally, while invasive ductal carcinoma is the commonest malignant lesion involving mainly age groups 30-49 years in our environment. Women with cancers in our environment, usually present with grades II and III lesions..

Keywords: Breast, Histopathology, Biopsy

Introduction

The presence of a breast lump has been known to cause apprehension, uncertainty, fear, anxiety and depression among women (1). This makes them to present to hospitals where assessment, necessary investigations and eventual reassurance are done (2). Usually the final arbiter is histologic tissue diagnosis, hence the importance of histopathological analysis of breast lesions cannot be over emphasized (3). Most breast histopathological results will be a benign lesions (with fibroadenoma been commonest) but at the other extreme and greatly feared, the result will be cancerous (3-4). Breast cancer in women is a major public health problem throughout the world. It is the most common cancer among women both in developed and developing countries and the principal cause of death from cancer among women globally (5). The incidence of breast cancer is rising due to factors not fully understood but thought to reflect lifestyle changes associated with westernization including late child bearing, having fewer children, consumption of calorie-dense food, physical inactivity and obesity (5,6)

In Nigeria, breast cancer incidence has increased from 15.3 per 100,000 in 1973 to 33.6 per 100,000 in 1992 and 116 per 100,000 in 2001 (7-9). Because of this increasing incidence, several articles have been published about breast diseases in Nigeria (3,4,7-11). Almost all the previous publications are from

data retrieved from government owned hospitals. A common fact is that there are private owned and operated diagnostic centers and hospitals and good number of members of the public visits them and use their services. This study aims to describe the pattern and characteristics of breast biopsies seen in Me Cure Healthcare Limited, a privately owned diagnostic centre, from 2009 to December 2013. The findings will add to the pool of data on histopathological study of breast diseases seen in Nigerians.

Methods

This retrospective study included histopathological reports of all patients which were received and processed by histopathology section of Me Cure Healthcare Limited (a modern large privately owned diagnostic establishment), from August 2009 to December 2013. This histopathology section renders services to many privately owned hospitals within Lagos State and few neighboring states. Lagos state has a population of about 17.5 million people and about 2,400 private hospitals. The specimens are brought to the laboratory either by staffs of the referring hospital, the patient or their relatives. There are 16 other privately operated histopathology laboratories in the state. These breast specimens included excision biopsies, incision biopsies, core needle biopsies and mastectomies. These breast specimens were received in 10% buffered formalin, and processed with auto processors. Paraffin embedded sections (at 2-3μm) were routinely stained with hematoxylin and eosin stains. Data were extracted from the establishment computer database and entered into an Excel sheet. Histological features were classified using 2003 WHO classification of breast diseases (12). Data were analyzed using predictive analytical software, version 17 (IBM, SPSS Inc, Chicago, IL, USA).

All reports with ambiguous conclusions were excluded. Also excluded were breast histopathology reports with any of the major identification parameters (like sex, age and diagnosis) missing. The exact number excluded or discarded records was not kept.

Results

A total of 1205 breast specimens were received for histology during the period under the review. This formed 26% of 4,642 histology specimens received in the pathology laboratory. The youngest patient was 11 years and the oldest 88 years with a mean of 31.7 years (SD 13.12). Female breast specimens accounted for 97.8% (n=1178) and male specimens accounted for 2.2% (n=27) with a female to male ratio of 43.4:1. Age group 20-29 years were most involved (n=362; 30%) closely followed by age group 30-39 years (n=288; 23.9%) and 10-19 years (n=245; 20.3%). The least involved age group was 80-89 years which accounted for 0.6% (n=6) as shown in Figure 1.

Figure 1: Age group and sex distribution of cases.
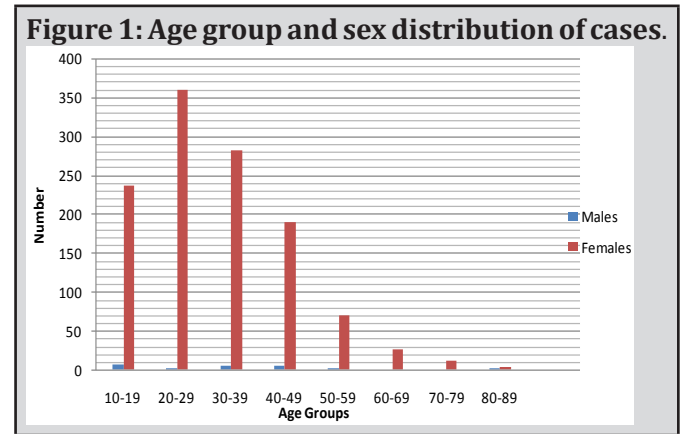
Figure 2: Invasive ductal carcinoma (Nottingham's grade 2) showing pleomorphic epithelial cells forming glands. These cells have enlarged vesicular to hyperchromatic nuclei.
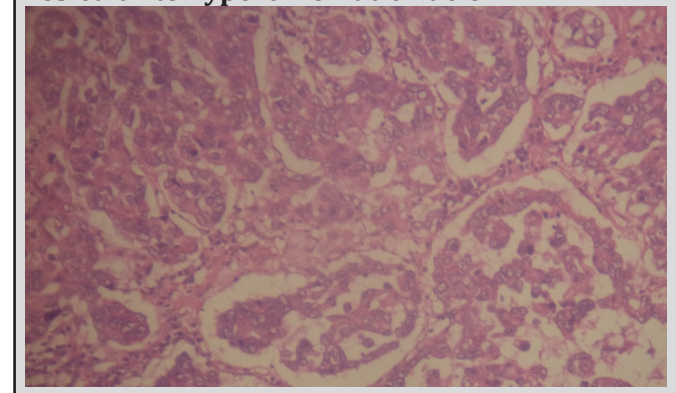
Figure 3: Mucinious carcinoma showing pleomorphic epithelial cells, with enlarged hyperchromatic nuclei, forming glands and surrounded by extensive areas of mucin
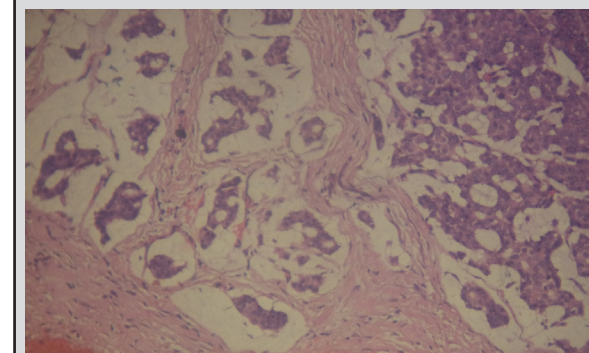
Malignant breast lesions accounted for 21.3% while benign lesions accounted for 78.7% of breast specimens. Age groups 40-49 and 30-39 years accounted for most malignant lesions (33.5% and 27.6% respectively) while the least (0.8%) was seen in 10-19 years age group. Most benign lesions (36.2%) were seen in 20-29 years age group closely followed by 10-19 years group which accounted for 25.2%. Least number of benign lesions was seen in 80-89 years age group as shown in Table1.

Table 1: Category of breast lesions seen in various age groups

Age group	Benign (%)	Malignant (%)
10 – 19	243 (25.6)	2 (0.8)
20 – 29	343 (36.2)	19 (7.4)
30 – 39	217 (22.9)	71 (27.6)
40 – 49	109 (11.5)	86 (33.5)
50 – 59	23 (2.4)	48 (18.7)
60 – 69	7 (0.7)	20 (7.8)
70 – 79	5 (0.5)	6 (2.3)
80 – 89	1 (0.1)	5 (1.9)
Total	948 (78.7)	257 (21.3)

Table 2 shows the benign breast lesions. Fibro-epithelial lesions were the most common with fibroadenoma accounting for 61.7% of all benign lesions with a mean age of cases been 24.6 years. The second most common benign lesion was fibrocystic disease which was seen in 21.2% of benign cases and the mean age of patients was 33.2 years. Proliferative breast diseases without atypia was seen in 5.6% of cases, while acute mastitis accounted for 1.7% of cases (both were responsible for third and fourth major causes respectively).

Invasive ductal carcinoma accounted for 92.2% of malignant lesions and the mean age of patients was 45.5 years. Carcinoma insitu accounted for 3.5% of cases with a mean age of 42.4 years as shown in Table 3. Nottingham grading on all the invasive ductal carcinomas show that 50.6% of cases were in grade II while grade III was seen in 37.6% of cases as shown in Table 4.

Table 2: Pathological distribution of benign breast disease

Lesion type	Frequency (%)	Mean age
FIBROEPITHELIAL/ STROMAL	**593**	
Fibroadenoma	585 (61.7)	24.6
Phylloides	2 (0.2)	34.5
Lipoma	3 (0.3)	41.7
Granular cell tumor	2 (0.2)	41
Leiomyoma	1 (0.1)	20
EPITHELIAL	**305**	
Fibrocystic disease	201 (21.2)	33.2
Proliferative breast disease without atypia	53 (5.6)	33.8
Gynecomastia	12 (1.4)	36.5
Tubular adenoma	10 (1.1)	22.1
Intraductal papilloma	10 (1.1)	37.2
Atypical hyperplasia	7 (0.7)	41.1
Sclerosing adenosis	4 (0.4)	25
Microglandular adenosis	3 (0.3)	37
Lactating adenosis	3 (0.3)	25.7
Blunt duct adenosis	2 (0.2)	20.5
INFLAMMATORY	**48**	
Acute mastitis	16 (1.7)	34.6
Fat necrosis	15 (1.6)	38.2
Duct ectasia	7 (0.7)	47.9
Chronic mastitis	5 (0.5)	39.8
Granulomatous mastitis	3 (0.3)	36.6
Calcinosis	2 (0.2)	49.5
SKIN LESIONS	**2**	
Squamous papilloma	1 (0.1)	37
Inclusion cyst	1 (0.1)	49

Table 3: Histological distribution of malignant breast lesions

Lesion type	Frequency (%)	Mean age
CARCINOMA	**254**	
Invasive ductal carcinoma	237 (92.2)	45.5
Cacinoma insitu	9 (3.5)	42.4
Medullary carcinoma	4 (1.5)	30.3
Mucinous carcinoma	2 (0.8)	29.5
Papillary carcinoma	1 (0.4)	34
Lobular carcinoma	1 (0.4)	44
SARCOMA	**3**	
Malignant phylloides	2 (0.8)	46
Chondrosarcoma	1 (0.4)	19
TOTAL	**257 (100)**	

Table 4: Nottingham's grading of Invasive Ductal Carcinomas	
Grade	Frequency (%)
Grade I	28 (11.8)
Grade II	120(50.6)
Grade III	89 (37.6)
Total	**237(100)**

Twenty seven cases were seen in male patients, out of which gynecomastia accounted for 12 (44.4%) cases while fibrocystic disease accounted for 5 (18.5%) cases. Invasive ductal carcinoma was the only malignant lesion seen in males and accounted for 5 (18.5%) cases as shown in Table 5.

Table 5: Lesions in males	
Lesions	Frequency (%)
Gynecomastia	12 (44.4)
Invasive ductal carcinoma	5 (18.5)
Fibroadenoma	5 (18.5)
Fibrocystic disease (change)	4 (14.8)
Proliferative breast disease without atypia	1 (3.7)
TOTAL	27 (100.0)

Discussion
Diseases of the breast are common and include problems related to pregnancy and lactation, abscess and other inflammatory conditions, non neoplastic proliferative disorders and neoplasms (10). Breast lesions formed 26% of all specimens, received and processed by the pathology laboratory. This is close to 22.3% reported in the only other published work in Nigeria on breast lesions from a privately owned laboratory (4). The rate of 26% is significant and shows that breast diseases are common in our environment. Breast diseases are known to pose health and cosmetic problems especially in females (13). "The anxiety and fear associated with increased awareness of breast cancer has significantly improved the health seeking behavior of patients with breast lumps (13)" This may explain the high rate of breast specimens seen in this study.

Benign lesions took the lead and were by far the most common, accounting for 78.7% of cases. Other studies in Ibadan, Benin, Gombe, Saudi Arabia and Pakistan equally reported higher number of benign cases (3,4,10,16,17). However a study in India reported a low benign breast lesion rate of 45.2% (16). The low rate was due to the belief by the authors that only malignant cases requiring specialized surgery and care were referred to their hospital while numerous private hospitals in their environment handled the benign breast lesions (16).

Fibroadenoma accounted for 61.7% of all benign lesions seen and was the most common with a mean age of 24.6 years. This is similar to findings from Ibadan (59%) and less than 69.3% reported in Saudi Arabia, 70% reported in Ghana and 88% in Pakistan (3,14,17). This fibroadenoma rate is higher than 43%, 42%, 8.5% and 7.7% reported in Benin, India, USA and England (4,15,16,18,19). The fact that fibroadenomas are common in Negros have been previously documented (20). This may be the reason for the high frequency of fibroadenoma in this present work and other African studies. Although fibroadenoma is not cancerous or life-threatening lesion, they can still be a source of anxiety and great concern to the patient. Advanced breast cancer is devastating to women and their husbands and children (21). Breast cancer accounted for 21.3% of cases with a mean age of 45.5 years (SD 12.38) and age group 40-49 years accounted for most cases (33.5%). This is fairly similar to previous findings from Benin (25.3%), higher than 10.5% reported in Ibadan and less than reports from Saudi Arabia (33.3%), Pakistan (37%), Gombe (40.5%) and India (54.8%) (3,4,10,14-16). However in all these previous studies from African and Asian countries, the age group affected most by breast cancer was the 4th decade, just like our finding. This differs from the 5th decade in Finland and 6th decade in United Kingdom (22,23). An observation in this series was a high rate of breast cancers in younger age group 30-39 years which accounted for 27.6% of breast cancers seen, closely following age group 40-49 years. This implies that more young people are involved and calls for greater awareness for self breast examination, clinical breast examination and establishment of national breast cancer screening programs. Though the reason for this higher number of premenopausal breast cancer in Nigerians than post menopausal breast cancers are uncertain, biological and genetic factors may be promoting early carcinogenesis (23). Also the distribution / demography of the population is a major determinant (23). While life expectancy of a Nigerian female at birth is 52.2 years that of a British female is 80.7 years. Only 4.8% of the Nigerian population is aged 60 years and above compared to 20.6% of the British population (24). A similar affect of demographics on peak age of breast cancer was made in Saudi Arabia by Al-Rikabi et al (14).

Invasive ductal carcinoma non-otherwise specified (NOS) accounted for 92.2% of all the malignant breast lesions. This is similar to previous findings (3,4,10,14-16). Histological grade and size are known to be a reflection of aggressive tumors and may be an important factor in racial / ethnic disparity. Grade is

evaluated at time of diagnosis and therefore reflects events occurring in the tumor before discovery and treatment (25). Using the Nottingham system, the invasive ductal carcinomas of non special type seen in this series composed of 50.6% of grade II and 37.6% of grade III lesions (26). This is similar to findings in Pakistan (15). Other studies also revealed that breast cancers in African American women usually have higher grade tumors compared to Caucasians (25). Majority of cancerous breast specimens in this present work had an average size of 4.5cm. This in conjunction with the high grade of the tumors and lack of national screening program may account for the late stage presentation and mortality seen in Nigeria (4).

Males were involved in 2.2% of cases with gynecomastia (44.4%) been the commonest lesion and distantly followed by invasive ductal carcinoma (18.5%). The rate of 2.2% is similar to 2.1% in Benin, but less than 3.4% and 9.3% reported in Ibadan and Saudi Arabia respectively (3,4,14). The mean age of males with cancer was 58 years (SD 22.9). The occurrence of male breast cancers commonly in the 5th decade (or a decade higher than in females) in Africa has been documented by Aligbe et al (4). Gynaecomastia had a mean age of 36.5 and was similar to findings by Aligbe et al and Al-Rikabi et al (4,14).

A major limitation of this study includes; lack of important information like summarized clinical details, occupation, socio-economic status of patients and TNM staging, which would have aided clinico-pathological correlation and a bearing to the occurrence of the disease. In addition, this study is from one centre and might not be representative of histopathology of breast lesions in Nigeria. There is a great need for a met analysis of various studies from Nigeria, so as to give a more comprehensive view of breast lesions.

In conclusion, this review has shown that benign breast lesions are more common, while invasive ductal carcinoma is the commonest malignant lesion involving mainly age groups 30-49 years in Lagos. Women with cancers in Lagos, usually present with grades II and III lesions.

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