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Breast malignancies in a tertiary health setting in North-Eastern Nigeria: a histopathological review

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Summary

Breast cancer is one of the most common malignancies that occurs in women. Most of the studies done on breast cancer in our setting are epidemiological. This study aims at determining the histopathological subtypes and various features of breast malignancies seen in our setting. The bench record books of the Department of Pathology, Federal Medical Centre Gombe were used to identify all the breast cancer cases seen from May 2000 to May 2007, after which the Haematoxylin and Eosin-stained slides and request forms were retrieved. The slides were reviewed based on the 2003 WHO classification of breast tumours. One hundred and thirty four breast cancer cases were reviewed histologically. Invasive ductal carcinoma (NOS) made up 66.6% (89/134), followed by invasive lobular carcinoma which comprised 9.7% (13/134). Medullary carcinoma was seen in 6.0% (8/134). Invasive papillary and sarcomatoid carcinomas comprised 3.0% (4/134) each. Invasive ductal carcinomas were graded as follows: grade I – 12%, grade II – 22.5%, and grade III – 65%. The majority of breast cancer cases occurred in the fourth and fifth decades of life. Invasive ductal carcinoma remains the most frequent histopathological subtype and most of the patients in this environment have grade III disease.

Keywords: *Breast malignancies; invasive ductal carcinoma*

Résumé

Le cancer du sein est l'une des maladies les plus communes qui survient chez les femmes. La plupart des études faites sur le cancer de sein dans notre cadre sont épidémiologiques. Cet étude a pour but de déterminer les sous types histologiques et les différentes caractéristiques. Les registres pris au département de pathologie, centre Médical Fédéral

de Gombe étaient utilisé pour identifier tous les cas de cancer de sein observe de Mai 2000 - Mai 2007, après lequel les teinture de l'hématoxyline et d'éosine des lames. Les lames épaisses étaient revues selon la classification de l'OMS de 2003 sur les tumeurs du sein. Cent trente quatre cas de cancer du sein étaient histologiquement revues. Le carcinome invasive (NOS) faisait 66.6% (89/134), suivi du carcinome lobulaire invasive qui comprend 9.7% (13/134). Le carcinome médullaire était observe a 6.0% (8/134). Les carcinomes papillaires et sarcomatoïde comprenaient 3.0% (8/134) chacun. Les carcinomes étaient classés tel qui suit: classe I- 12%, classe II- 22.5%, et classe III- 65%. La majorité des cas de cancer du sein survenait entre 40 et 50 ans. Le carcinome reste le sous type histopathologique le plus fréquent et la plupart des patients dans cet environnement ont un mal de classe III.

Introduction

The breast is a unique organ in that it is not fully developed at birth, undergoes cyclical changes during reproductive period, and starts to involute long before menopause [1]. This unique feature of cyclical proliferation and atrophy which is controlled by several hormonal, and genetic factors make it prone to abnormal proliferation and development of malignancy.

Breast cancer is one of the most common malignancies that occur in women. The major risk factors for the development of breast cancer are hormonal and genetic [2]. Breast cancers can therefore be divided into sporadic cases, possibly related to hormonal exposure, and hereditary cases, associated with family history or germ-line mutations [1]. Hereditary cancer has received intense scrutiny in order to unravel the specific genetic mutations [1,2]. About 25% of familial breast cancers can be attributed to two highly penetrant autosomal dominant genes: BRCA1 and BRCA2 both of which are tumour suppressor and DNA repair genes [3]. Loss of their functions due to mutations confers an increased risk of malignancy.

The major risk factors for sporadic breast cancers are related to hormonal exposure. The majority of these cancers occur in postmenopausal women and over-express oestrogen receptors [4]. Oluwole and co-workers in Ife, Nigeria worked on the histological pattern of breast diseases and found that 21% of the lesions were carcinomas [5].

A histological review of breast diseases in Karachi, Pakistan showed that invasive ductal carcinoma had the highest frequency, constituting 37% [6]. Most of the studies done on breast cancer in our setting are epidemiological. The aim of this study is therefore to determine the histopathological subtypes and associated features of breast malignancies seen in our environment.

Materials and methods

This study is a seven-year retrospective histopathological review of breast malignancies diagnosed in the histopathology department of Federal Medical Centre (FMC), Gona, North-Eastern Nigeria, from May 2000 to May 2007. The department receives biopsy specimens from Gombe and neighbouring Adamawa, Taraba and Yobe states of Nigeria.

The biopsies were previously fixed in 10% formal saline, processed in an automatic tissue processor, and paraffin-embedded tissue sections were cut and stained with Haematoxylin and Eosin (H&E). The bench record books were used to identify all cases of breast cancer, after which the H&E stained slides and request forms were retrieved.

Paraffin-embedded tissue blocks were also retrieved where necessary to make new slides. The personal data and clinical information of the patients were extracted from the request forms. All cases whose request forms, slides/tissue blocks could not be retrieved and those in which ages were not stated were excluded from the study.

The slides were reviewed by AAM and MSS and the cancers were classified based on the 2003 WHO classification of breast tumours. The data was analyzed using Microsoft Excel.

Results

The department received 337 breast tissue specimens out of which 136(40%) were histologically diagnosed as breast malignancies. However, the slides and tissue blocks for two of these cases could not be found and these were therefore excluded from the study. As such, 134(39.8%) cases were histologically reviewed. Figure 1 shows the types of specimens received in the department. Mastectomy specimens constituted 64%, while lumpectomy specimens formed 21% of the cases. Incisional and tru-cut biopsies constituted 9% and 6% of cases respectively. Invasive ductal carcinoma constituted 66.6%(89/134), followed by invasive lobular carcinoma which had 9.7%(13/134) as shown in table 1. Medullary carcinoma occurred in 6.0%(8/134). Invasive papillary and sarcomatoid carcinomas had 3.0%(4/134) each. In situ papillary carcinoma, in situ comedo carcinoma and stromal sarcoma were diagnosed in 2.2%(3/134) each. In situ lobular carcinoma, lymphoma and

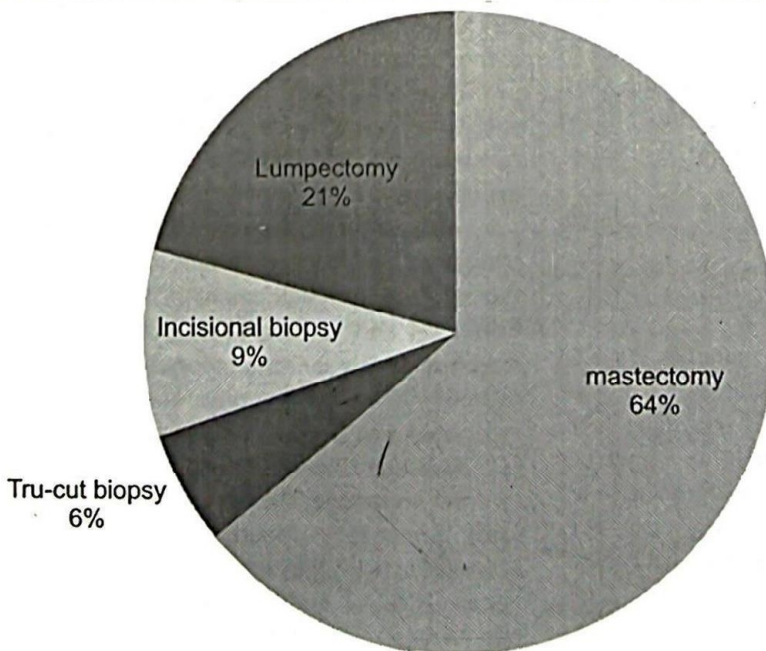


Fig. 1: Type of specimens submitted to the department of histopathology

mucinous carcinoma occurred in 1.5%(2/134) each, while malignant phyllodes tumour was the least common with only 0.7%(1/134).

Table 1: Histological types of malignant breast tumour

Histological type	No of cases	Percentage
Invasive ductal carcinoma (NOS)	89	66.6
Invasive lobular carcinoma	13	9.7
Medullary carcinoma	8	6.0
Invasive papillary carcinoma	4	3.0
Sarcomatoid carcinoma	4	3.0
In situ papillary carcinoma	3	2.2
In situ comedo carcinoma	3	2.2
Stromal sarcoma	3	2.2
In situ lobular carcinoma	2	1.5
Lymphoma	2	1.5
Mucinous carcinoma	2	1.5
Malignant phyllodes tumour	1	0.7
Total	134	100

Table 2 depicts the histological grading and associated histological features (necrosis, lymphocytic

Table 2: Histological grading and other associated features of invasive ductal carcinoma (NOS)

Histological grade	No(%)	Necrosis (%)	Lymphocytic infiltrates (%)	Calcification (%)
Grade I	11 (12)	1 (8.3)	3 (27)	0 (0)
Grade II	20 (22.5)	4 (20)	6 (30)	2 (10.0)
Grade III	58 (65)	20 (34.4)	24 (41.4)	8 (13.8)
Total	89 (100)			

infiltration, and calcification) of invasive ductal carcinomas. Grade I tumours constituted 12%, grade II tumours 22.5% while grade III tumours comprised 65% of the cases. Necrosis occurred in 8.3% of grade I cases, 20% of grade II cases and 34.5% of grade III cases. Grade III tumours showed lymphocytic infiltration in 41.4% of cases while grades II and I exhibited 30% and 27% respectively. Dystrophic calcification was discernible in 13.8% and 10% of grades III and grade II tumours respectively.

Fifty three cases (39.6%) of these breast cancers exhibited axillary lymph node metastases, the majority of which had breast masses that were over 2cm in diameter and were submitted as mastectomy specimens. Two cases of invasive ductal carcinoma with Paget's disease of the nipple were seen.

Age distribution of all breast cancer cases seen during the review period is shown in table 3. Majority of the cases i.e. 42(31%) occurred in the

fourth decade of life. Thirty-five cases (26%) occurred in the fifth decade. The third and sixth decades had 18%(24/134) each. Seven cases (5.2%) were seen in the seventh decade while 1.5%(2/134) occurred in the second decade of life.

Table 3: Age distribution of 134 cases of breast cancers

Age range (yrs)	No of cases	Percentage
01 – 10	0	0.0
11 – 20	2	1.5
21 – 30	24	18
31 – 40	42	31
41 – 50	35	26
51 – 60	24	18
61 – 70	7	5.2
Total	134	100

Discussion

One hundred and thirty-four cases of breast cancers were reviewed and analyzed, and these formed 39.8% of all breast lesions seen during the review period. This percentage is close to previous reports

by Dogo and co-workers in Maiduguri, North-Eastern Nigeria [7] and Mandong and co-workers in Jos, North-Central, Nigeria [8]. Amongst the malignant neoplasms, invasive ductal carcinoma (NOS) had the highest occurrence, accounting for 66.6% of cases. This is close to reports from other previous studies [5,7,8,9]. Invasive lobular carcinoma was the second most common cancer constituting 9.7%. This is in agreement with previous reports from Ife, South-Western Nigeria [5] and Maiduguri, North-Eastern Nigeria [7] but higher than other previous findings [6,8]. Medullary carcinoma occurred in 6.0% and this is similar to what obtained in a previous study [2].

Histological grading of cases of Invasive ductal carcinoma (NOS) was done because they formed the majority of cases and the criteria by Bloom and Richardson was used [10]. Grade I, grade II and grade III tumours constituted 12%, 22.5% and 65%

respectively. This is similar to other studies that showed that grade III tumours constituted the highest number of these carcinomas [10,11].

Necrosis and lymphocytic infiltrates occurred more in grade III tumours than in grades I and II tumours. This is probably due to the fact that the more poorly differentiated a tumour is the more likely it have foci of necrosis and lymphocytic infiltrates [12]. Dystrophic calcification occurred in 13.8% and 10% of grades III and II tumours respectively. However, no histological features were significantly and statistically associated with the tumour grade in this group of cancers.

The majority of the specimens received in the department were mastectomy specimens (64%), followed by lumpectomy specimens (21%). Over 70% of the patients that had mastectomy also had a previous Fine Needle Aspiration Cytology (FNAC) diagnosis and the majority of these patients were from FMC Gombe. This is because FMC Gombe runs an FNAC clinic, which provides for a cytological diagnosis before surgery is done.

Over 40% of mastectomy specimens submitted had axillary lymph node metastasis. Axillary lymph node status is the most important prognostic factor for invasive cancer in the absence of distant metastasis [1]. Clinical assessment of nodal involvement requires biopsy for histological confirmation [5]. It is generally held that the presence of regional axillary lymph node metastasis indicates the distant metastatic potential of an individual breast cancer. This is true in a quantitatively predictive manner, i.e. the more involvement there is in axillary lymph nodes, the more likely that the carcinoma has distantly metastasized and will eventually lead to the death of the patient [13].

Most of our patients with axillary lymph node metastasis also had breast masses that were over 2cm in diameter. The size of carcinoma is said to be the second most important prognostic factor and is said to be independent of lymph node status [13]. Women with node negative carcinomas under 1cm in diameter have a prognosis approaching that of women without breast cancer. The majority of patients with cancers over 2cm in diameter usually have lymph node metastasis and eventually succumb to the disease [14, 15].

The majority of breast cancers in this study occurred in the fourth decade of life. This contrasts with a previous report from Maiduguri [7] but is in agreement with other studies [9, 13]. Two (1.5%) of the breast cancer patients were below the age of 20 years. This is similar to what obtained in the

Maiduguri study [7] This is quite a disturbing trend and the reason is however still unclear.

The limitation of this study is that oestrogen and progesterone receptor determination could not be done and this is quite important in the management of patients with breast cancer. Oestrogen receptors (ER) and progesterone receptors (PR) are indicators of breast cancer prognosis and predictors of response to hormonal manipulation therapy [15,16].

The presence of facilities for immunohistochemistry in tertiary health centres is therefore very important for identification of ER and PR positive carcinomas. This research has revealed that invasive ductal carcinoma still remains the most frequent histopathological subtype of female breast cancer in this environment with most patients having grade III disease and they come to the hospital at later stages of the disease. Public education and provision of facilities for mammography are very important.

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