

Breast Evaluation Findings in Calabar, Nigeria

Anthonia Ikpeme^{1*}, Akintunde Akintomide¹, Grace Inah¹, Afiong Oku²

¹University of Calabar Teaching Hospital, Radiology, 4 Elijah Henshaw Street, Calabar, Cross River 54001, Nigeria;

²University of Calabar Teaching Hospital, Community Medicine, 4 Elijah Henshaw Street, Calabar, Cross River 54001, Nigeria

Abstract

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***Correspondence:** Dr. Anthonia Asanye Ikpeme. University of Calabar Teaching Hospital, Radiology, 4 Elijah Henshaw Street, Calabar, Cross River 54001, Nigeria. Phone: 08066464775. E-Mail: ikpemeanthonia@yahoo.com

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BACKGROUND: X-ray and sonomammography constitute a significant option in the early detection and management of breast diseases in the developed world. Unfortunately these modalities became available in Nigeria, only in the past few decades.

AIM: The aim of this audit is therefore to document the imaging findings, in the past three years in a developing facility in Nigeria relating them with the demographic features.

METHODS: We prospectively studied the x-ray and sonomammography in all patients, presenting over a three year period, for breast evaluation with the hope of discerning the epidemiologic pattern of breast lesions in this environment.

RESULTS: One hundred and forty-five females and four males. Median was 38 years (IQR=30-48). The commonest reason for evaluation was screening. Patients that were below 38 years showed no significant difference in frequency and type of lesion compared with patients over 38 years. The commonest breast pattern was fatty replaced. The upper outer quadrant was the commonest site.

CONCLUSION: Patients presenting for breast evaluation in Calabar do so for screening mainly. Patients below 38 are nearly equally affected by malignant breast disease as their older counterparts. The commonest breast pattern was fatty replaced. Digital mammography should be available in all tertiary institutions.

Introduction

Evaluation of patients presenting with breast symptoms or for breast screening in the outpatients department and at the imaging department without referrals is quite a common phenomenon. It is therefore not surprising that hospital breast services in the United Kingdom have come under increasing pressure from their diagnostic work load in breast disease, both for symptomatic persons and for breast cancer screening [1]. This unfortunately cannot be reported as same in developing countries such as ours. Despite several efforts by government to increase the awareness of breast cancer in our country, patients do not often seek breast evaluation till very late in the disease [2, 3]. Common breast symptoms seen in women and sometimes in men include breast pain, lump, nipple discharge and chronic ulceration of the breast [4]. In Calabar, South-South Nigeria, many individuals present for screening, contrary to what was observed in other studies done

within Nigeria [4].

The commonest tools for screening and diagnosing breast conditions include conventional mammography, breast ultrasound (BUS) and magnetic resonance mammography [5]. Magnetic Resonance Mammography is by far the most sensitive of all three [5]. This modality is not readily available, and it is expensive. However has several uses including its use as a screening tool for patients determined to be at high risk of breast cancer and to determine integrity of breast implants; as well as when conventional mammography and breast ultrasound have failed to reach a diagnosis [5]. Unfortunately Calabar, Nigeria, mammography has only become available in the past three years. In addition although ultrasound has been available for some time the skill to use it for breast imaging has also only been recently available in this environment.

This work is therefore an attempt to document the breast ultrasound (sonomammography) and the mammography findings in the Calabar area in the past three years. This may be a pointer to the

epidemiology of breast pathology in both males and females in this environment.

Methods

This was a prospective descriptive study of both adult men and women presenting at the General Out patients, Surgery or Gynaecology clinics of the University of Calabar Teaching Hospital with varying breast symptoms or for screening over the past three years (February 2011 to January 2014). Data obtained included age, gender, clinical history, family history of breast disease especially breast cancer, previous scan or mammography, past history of breast cancer or any other cancer. Each subject had either breast ultrasound, conventional mammography or both.

Technique of BUS and Mammography

The indications for breast ultrasound in this study included all patients with the above breast symptoms less than 40 years of age in whom mammography could not be done because they were under aged, and those above 40 years as an adjunct to the conventional mammography done. Detailed history and physical examination of the breasts were obtained before the examination. The procedure was carefully explained before commencement. All scans were done with a linear transducer whose frequency ranges between 7-12 MHz on a Sonoscope "SSI 6000 Sonographic scanner". Each patient was scanned supine in the contra – lateral posterior oblique position, and was asked to position her ipsi - lateral hand behind her head. This position is the best to achieve good penetration of the chest wall as well as satisfactory orientation of the breast. Longitudinal and transverse scan planes were obtained. X-ray mammography was used, with a dedicated mammographic x-ray-unit, GE-Senographe DMR. Two standard views obtained; cranio-caudal and medio -lateral oblique projections. All mammographies were conducted by well qualified technologists. All breast ultrasounds were carried out by Specialist radiologists and all mammograms were interpreted by same.

Individual sonographic and sonomammographic characteristics including shape, margin, lesion boundary, lesion orientation and echo-texture that indicate whether a lesion is malignant, benign or indeterminate were evaluated. Breast lesions were classified as benign or malignant and reported according to the breast imaging reporting and data system (BI-RADS) designed by the American College of Radiology (ACR) and developed for ultrasound and mammogram. Location of masses on both mammography and BUS were defined by dividing the quadrants of the breast as though it were the face of a clock into five main parts including upper and lower inner quadrants, upper and lower outer quadrants and

the central or peri-areolar locations.

The collected data was analysed using SPSS version 20. Frequency tables, pie charts and histogram were used to analyse the data. Chi-square test was used to test significance of difference between proportions with level of significance set at $p < 0.05$.

Results

One hundred of forty-nine patients participated in the study. Of these 145(97.3%) were females while 4(2.7%) were males. Seventy-four (49.6%) of the subjects were below while 75(50.35%) were above 38 years of age (Table 1). The median age was 38 (IQR= 30-48).

Table 1: Age and gender distribution of subjects.

Variable	Frequency	Percentage
Age		
≤29	29	19.5
30-39	49	32.9
40-49	37	24.8
≥50	34	22.8
Median	38 (IQR 30-48)	
Sex		
Male	4	2.7
Female	145	97.3

Screening and breast lumps were the commonest indications for presentation (Figure 1).

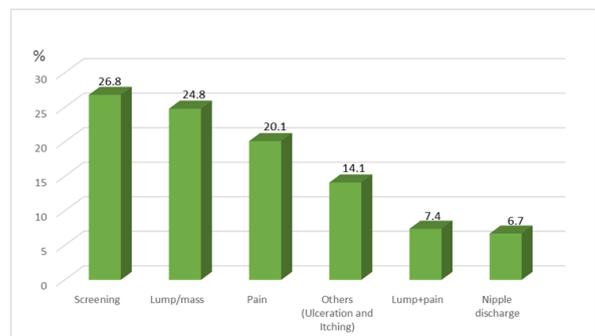


Figure 1: Common presenting symptoms of patients.

Fatty replaced pattern was by far the commonest breast pattern encountered. This was followed by fibro glandular pattern (Figure 2).

Table 2 shows the distribution of BI-RADS Category by age and gender.

There was no significant difference in the distribution between those below 38 and above 38 years of age. Similarly there was no significant difference in the distribution between the genders (Table 2).

Figures 3 and 4 demonstrate the anatomic distribution of benign and malignant lesions respectively in the breast. Both benign and malignant lesions were located mainly in the upper outer quadrant of the breast.

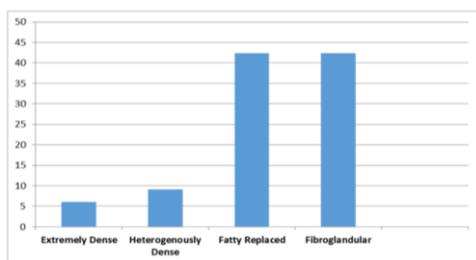


Figure 2: Mammographic breast pattern of subjects.

Figures 5a, 5b show fatty replaced fibroglandular breast patterns respectively as shown on mammography.

Table 2: Relationship between age, sex and birads category.

	FREQUENCY (%) (BI-RADS III and below)	FREQUENCY(%) BI-RADS IV and above	X ²	P-value
Total number of patients	138	11		
Age				
<38	69 (92.0)	6 (8.0)	0.08	0.77
>38	69 (93.2)	5 (6.8)		
Sex*				
Male	4 (100)	0 (0)	1.00	1.00
Female	134 (92.4)	11 (7.6)		

*Fisher's exact test.

Figures 6a, 6b show benign and malignant lesions respectively as seen by ultrasound.

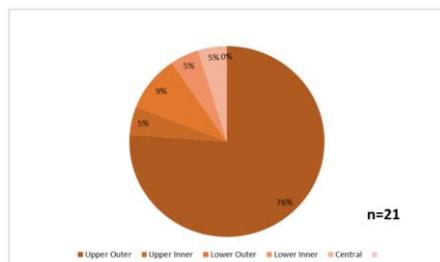


Figure 3: Distribution of benign breast masses by location.

Discussion

The present study has shown an increasing awareness of the need for screening for breast lesions in a developing environment. It had already been assumed that utilization of screening services in the developing world was low. This may have been due to lack of access. Breast cancer is the most common female malignancy worldwide and a leading cause of cancer death [1]. This statistics is not different in Nigeria where breast cancer has become the most common female cancer, taking over from cervical cancers.² However the time of presentation of these patients varies a great deal in Nigeria. Two thirds of breast cancer patients in Nigeria and many developing nations present late that is when the disease is already advanced [2, 3]. Breast cancer in Nigeria and many developing nations present a decade earlier than their Caucasian counterparts [4].

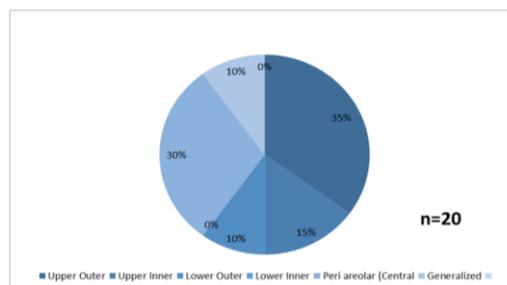


Figure 4: Distribution of malignant breast masses by location.

Breast imaging is a valuable tool in the screening as well in the investigation of symptomatic breast disease [5]. Breast ultrasound, conventional mammography and magnetic resonance mammography are the imaging modalities available. The first two are readily available, cheaper with studies indicating that the use of ultrasound in addition to mammography improves sensitivity and specificity when compared with the use of either [6]. Other studies have gone further to suggest that the sensitivity of ultrasound alone is superior to that of mammography alone in younger women since their breasts are still quite dense and hitherto occult cancers missed on mammography maybe picked on ultrasound [7-10]. Ultrasound also provides a premise for ultrasound guided biopsies [10].

The BI-RADS classification has been developed for both ultrasound and mammogram for characterization of lesions into benign and malignant. There are six categories. BI-RADS 1 and II indicate that there is no mammographic evidence of malignancy. BI-RADS III refers to probably benign cases and exhibit < 2% likelihood of malignancy. BI-RADS IV-VI are suspicious and histology proven cancers respectively [11-14].

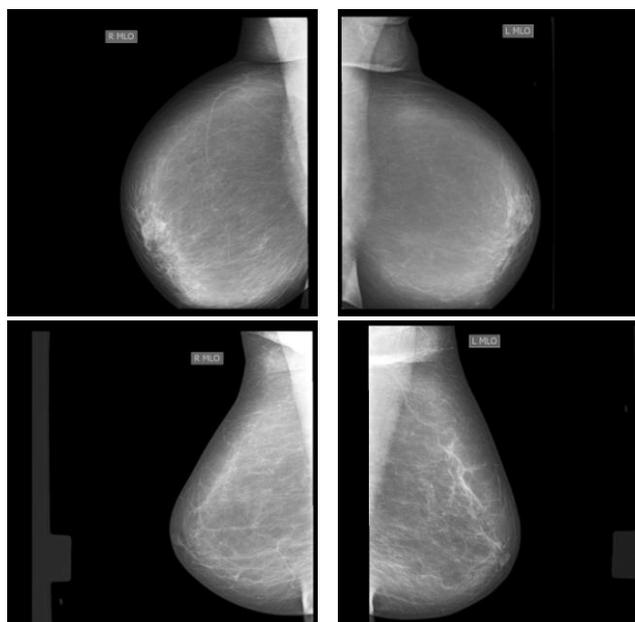


Figure 5: Mediolateral oblique views of both breasts showing fatty replaced breast pattern (upper). Mediolateral oblique views of both breasts showing scattered fibroglandular breast pattern (lower).

We encountered only four males in our study. None had malignant lesion. This finding is similar to findings elsewhere. Johnson et al., [15] observed that cancer is rare in men. Those with gynaecomastia often become anxious and seek medical attention, making this presentation fairly common in primary care settings and mostly of benign etiology. In Calabar a study by Umoh et al., [16] showed that over a 20 year period, 1983-2013, thirty cases of male breast cancer was encountered [16], showing that it is not that rare in Nigeria. The commoner symptoms encountered in our study were lumps or breast pain. These agreed with the findings in another Nigerian study, Ibrahim et al., [3] where 95% of patients presenting in breast clinic presented because of breast lumps.

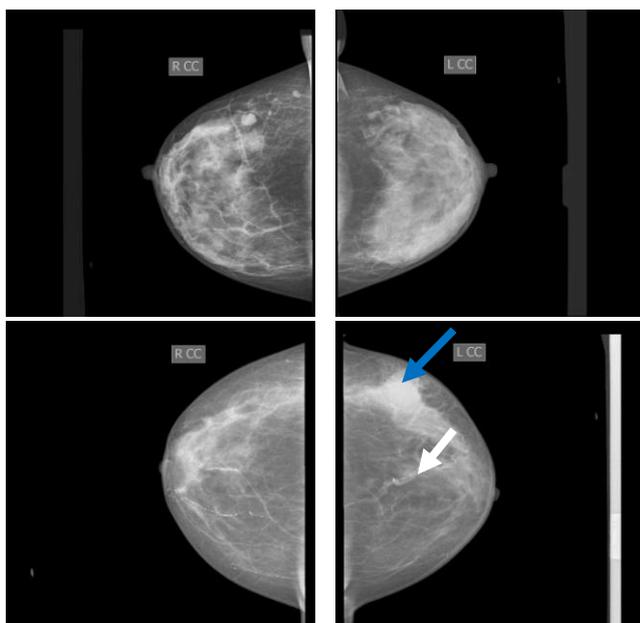


Figure 6: Craniocaudal views of both breasts showing a benign looking mass with distinct borders and a calcific density suggestive of a calcified fibroadenoma (upper). Craniocaudal views of both breast showing a malignant looking mass with indistinct margins and distorted surrounding breast tissues and micro calcifications in the left breast (lower).

Our study recorded quite high number of patients presenting for screening. This differs with other studies done elsewhere in the country. Adisa et al., [17] showed that in some developing countries such as Nigeria, routine screening for breast cancer is not yet commonly practiced and a large number of patients still present late. This is compounded by limitation of resources necessary for care of these patients [3]. The trend may be changing. The median age encountered was 38 years. The numbers of patients with BI-RADS I-III WAS 138 (93%) while those with BI-RADS IV and above were only 11 (7%). The commonest age group with which breast malignancy was found was 30-39 years. This finding agrees with the study of Carey et al., [18] which showed that black women under age of 35 have more than twice the incidence of invasive breast cancer and three times the breast cancer mortality of young white

women. This earlier occurrence in African American women has been attributed to personal risk factors which include women with strong family history of cancer, especially in women harboring a germ line BRCA 1 and 2 mutation, sedentary lifestyle and obesity [18, 19]. Obesity and sedentary lifestyle cannot be said to be encountered among Nigerian women therefore other risk factors may be playing a role.

Malignant breast disease occurring in older women was equally common in our study. This has been attributed to increased body mass index, increasing average life expectancy, empowerment of women, which is increasing women's ability to make independent decisions about their own healthcare [4, 18, 19] amongst others. This was seen in the high number of patients who presented for screening in the index study. This study also revealed higher incidence of fatty replaced and fibroglandular breast patterns. This can probably be explained by the nearly equal distribution of the age groups encountered in our study 74 (49.6%) and 75 (50.3%) in those above and below 38 years respectively. Whereas fatty replaced pattern occurs in the peri menopausal age group, fibroglandular and dense breasts occur in the younger age groups [21]. The density of breast tissue on a mammogram is a strong predictor of breast cancer risk and may reflect cumulative oestrogen effect on breast tissue [21-23]. All our patients with fibroglandular and dense breast patterns were therefore advised on follow up. Malignant and benign breast masses predominantly occurred in the upper outer quadrants. The possibility that primarily dense breast tissues are located within the upper outer quadrants [20] could be one of the reasons why masses, particularly malignant breast masses, tend to occur more in this region.

Conclusion

The present study has demonstrated that patients in the 30-39 year age group showed the highest frequency of malignant breast lesions, (BI RADS IV AND V) indicating a decade earlier presentation of malignant breast disease when compared with reports from Europe and North America. Most of these patients presented for routine screening or because of breast lump. Expectedly females were more common than males. The main breast patterns encountered were fatty replaced and fibroglandular breasts.

It is our recommendation that breast screening be brought forward about a decade earlier than the internationally accepted forty years. Heterogeneously dense breasts, which are a common breast pattern in the young, are better assessed with the use of digital mammography so as to increase the pick up rate of early malignant lesions. It is therefore recommended that this be made available in tertiary

hospitals around the country. More public awareness should be created on the value of early breast evaluation for both symptomatic and symptom free screening.

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