RESEARCH ARTICLE

Challenges in the management of inconclusive breast findings on mammography in educated Nigerian women

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ABSTRACT

Introduction: Breast cancer is one of the leading causes of morbidity and mortality among women in middle to low-income countries with most women presenting with late disease. Mammography is a major screening tool for the early detection of breast cancer with wide coverage in developed countries when compared to low-income countries.

This study aims to evaluate the mammographic findings of women in southwest Nigeria, and also the follow-up rate of women with inconclusive findings on mammograms,

Methodology: This is a descriptive study of findings in women who presented for mammography at the Radiology Department of LAUTECH Teaching Hospital, Ogbomoso. Mammograms with two standard views were performed after the completion of a structured questionnaire and informed consent. The data was entered and analyzed using SPSS version 26 with a p-value ≤ 0.5.

Results: A total of 250 women participated in the study with an average age of 52.3±8.70 years and an age range of 36-86 years. Diagnostic mammography (55.2%) was more common than screening mammography and the commonest indication was breast lumps (25.2%). Heterogeneously dense breast density pattern (BIRADS C) which may obscure small masses is the most common (40.8%) while the most common final BIRADS category is 2, benign findings (51.6%), followed by BIRADS 0 (20%). Only 13 out of the 51 cases of BIRADS 0 had complementary imaging studies, and 38 (75%) failed to show up. Further, telephone interviews revealed that the most common reason for failure of follow up is poor counselling and ignorance.

Conclusion: There is a need to increase the awareness of regular mammograms for screening purposes in this environment as observed in developed climes and also for women to understand the clinical implication of their breast density pattern to reduce anxiety and increase their cooperation for further imaging studies.

Introduction

Breast cancer is a leading cause of cancer in African women in both high and low-middle-income countries with an increased incidence observed in low-middle-income countries due to increasing life expectancy, increased urbanization as well as adoption of Western culture and lifestyles[1,2]. Breast cancer is the most commonly diagnosed cancer exceeding that of lung cancer[3]. Higher mortality occurs in low- and middle-income countries where women present late, due to cultural taboos, religious beliefs, and non-availability of equipment for investigation or their high cost[2,4–6]. Mammography is an important screening tool that can help detect breast cancer early and may result in the reduction of the mortality rate. Mammography utilizes low dose ionizing radiation and is highly sensitive in detecting subtle lesions in the breast, especially microcalcifications. A major drawback is that Mammography is not widely available in low-middle-income countries like Nigeria, although, in recent times, there has been increased patronage of mammography for early detection of breast cancer[7–9].

BI-RADS 0 screening mammograms require diagnostic follow-up imaging within 60 days, and reports have shown a lot of African women are lost to follow-up despite abnormal mammograms. We hypothesize that this is a major contribution to the late presentation of African women with breast cancer.

Our study evaluated the normal breast density patterns and mammographic findings in women who presented for screening and diagnostic mammography at Lautech Teaching Hospital, Ogbomoso in Southwest Nigeria and to identify the reasons for delayed or failure of follow-up imaging.

Materials and Methods

This is a descriptive study among 250 women who presented for mammograms at the Radiology Department of Ladoke Akintola University Teaching Hospital, Ogbomoso, a sub-urban town in Oyo State, Nigeria. Ethical approval from the institutional review committee was obtained with the number LTH/OGB/EC/2023/430. The participants completed a structured study questionnaire with their sociodemographic, parity, family history, and other relevant history after informed consent was obtained.

The mammogram was performed using the Philips MicroDose Digital Mammographic machine, Model SI L50, 2013®(Sweden) with two standard views of Mediolateral oblique and Craniocaudal views.

All consenting women who presented for mammograms within the study period were included while lactating mothers, women with recent history of surgery or biopsy, as well as women not consenting to participate in the study were excluded.

The breast parenchymal density and risk of malignancy of lesion were categorized using the American College of Radiology (ACR) Breast Imaging Reporting and Data Systems (BIRADS) categories updated to version 2013[8].

Data was entered and analyzed using the statistical package for the social sciences Windows version 26.0 (SPSS Inc. Chicago, IL, USA). The results are presented using the frequency tables and percentages. The test of association between the breast pattern of mammography, and the final BIRADS category with some demographics was tested using the chi-square with likelihood ratio.

Telephone interview: - a medical doctor and senior radiologist conducted a telephone interview, using a structured questionnaire to ensure consistency between interviewers. The interview was to ascertain the reason for the failure to come for a follow-up Breast Scan or further views on mammography. The structured telephone interviews were conducted on patients with a final BI-RADS category of 0.

Results

A total of 250 participants had mammograms, with a mean age of 52.3±8.70 years. Most of the subjects are within the 4th and 5th decade of life and a tenth of the participants had a positive family history in this study. (Table 1)

Less than half of the patients (44.8%) presented for screening mammograms while 55.2% presented for diagnostic mammograms (Table 2). Breast lump was the most common indication for diagnostic mammograms (Table 3). According to the ACR classification of breast density pattern, the heterogeneously dense breast pattern (40.8%) was the most prevalent among the patients while the extremely dense was the least (7.6%) (Table 4).

Most of the patients had a final BIRADS category of 2 which is Benign (51.6%) while the least is histology proven-BIRADS 6 (1.2%). BI-RADS 0 occurred mainly in dense breasts accounting for 20.4% (Table 5).

There is a statistically significant positive association between the age of patients and their parity with the breast density pattern. (Table 6 & 7)

Among the Fifty-one subjects with BIRADS 0, Thirteen had additional Breast ultrasound, and 38 subjects failed to show up for follow-up procedures. Eighteen subjects were interviewed by telephone to ascertain reasons for failure to complete their imaging studies, and 20 were lost to follow-up. (Table 8). The most common reasons for failure of follow-up were ignorance, not properly counselled for the need for follow-up studies by the Radiologist and procrastination.

Table 1: Socio-demographic distribution of participants

Demographic characteristics	Frequency(N=250)	Percentage (%)
Age Mean±SD=52.3±8.70yrs		
<40yrs	13	5.2
40-49	95	38
50-59	88	35.2
60-69	44	17.6
>70	10	4.0
Parity		
0	13	5.2
1	10	4.0
2	46	18.4
3	69	27.6
4	78	31.2
5	24	9.6
>5	10	4.0
Use of contraceptives		
Yes	42	16.8
No	208	83.2
Family history of breast cancer		
Yes	27	10.8
No	223	89.2

Table 2: Types of mammogram

Purpose	Frequency	Percentage (%)
Screening	112	44.8
Diagnostic	138	55.2
Total	250	100

Table 3: Indications for presenting for Mammogram

Indications	Frequency	Percentage (%)
Breast lump	63	25.2
Breast Pain	57	22.8
Breast Discomfort	6	2.4
Nipple discharge	5	2.0
Breast lump and pain	4	1.6
Breast lump and nipple discharge	1	0.4
Breast Pain and nipple discharge	2	0.8
No Complaint	112	44.8
Total	250	100

Table 4: Classification based on Breast Density Pattern

Breast Density (ACR-Classification)	Frequency	Percentage (%)
Homogeneously Fatty-BIRADS A	33	13.2
Scattered Fibroglandular-BIRADS B	96	38.4
Heterogeneously Dense-BIRADS C	102	40.8
Extremely Dense-BIRADS D	19	7.6
Total	250	100

Table 5: Final BIRADS classification

Final BIRADS classifications	Frequency	Percentage
Inconclusive	51	20.4
Normal findings	10	4.0
Benign findings	129	51.6
Probably Benign	18	7.2
Suspicious of malignancy	25	10.0
Highly suggestive of malignancy	14	5.6
Histology Proven	3	1.2
Total	250	100

Table 6: Correlation between age and breast density

Age	<39yrs (%)	40-49yrs (%)	50-59 yrs (%)	60-69 yrs(%)	>70yrs (%)	Total	Likelihood Ratio	p-value
Fatty	1(3.0)	7(21.2)	11(33.3)	12(36.4)	2(6.0)	33	34.843	0.000
Scattered fibroglandular	0(0)	30(31.3)	39(40.6)	21(21.9)	6(6.3)	96		
Heterogeneously dense	1(1.0)	56(54.9)	34(33.3)	9(8.8)	2(2.0)	102		
Extremely dense	0(0)	13(68.4)	4(21.1)	2(10.5)	0(0)	19		

*P-value ≤ 0.05 is significant

Table 7: Association between breast density pattern and number of children

No of children	0 (%)	1-4(%)	5 and above(%)	Likelihood Ratio	p-value
Fatty	1(3.1)	22(10.8)	10(29.4)	13.995	0.030
Scattered fibroglandular	21(65.6)	80(39.4)	14(41.2)		
Heterogeneously dense	9(28.1)	85(41.9)	8(23.5)		
Extremely dense	1(3.1)	16(7.9)	2(5.9)		

*P-value ≤ 0.05 is significant

Table 8: Reasons given by participants for Defaulting on follow up—multiple responses

Reasons for defaulting on follow-up	N	%
Financial	3	9.1
Ignorance	9	27.3
Fear	4	12.1
Distance	3	9.1
Procrastination	3	9.1
Physician assurance	3	9.1
Not informed by Radiologist to come for further tests.	8	24.2
Total	33	100.0

Discussion

Mammography is one of the screening methods for breast cancer and the gold standard[8].

The mean age of the participants who presented for mammography was 52.3yrs, this agrees with the mean age in previous studies in Nigeria, although breast cancer occur earlier in African women, and some have advocated that screening should begin at younger ages[8–10]. The indications for mammography varied among the participants who presented for diagnostic mammograms however, breast lumps and pains had the highest percentage in this study. Most breast lumps are benign, but the presence of a lump is the most common reason women present for diagnostic mammography[7,10–13].

More than half of the participants came for diagnostic mammography as compared to screening. This is corroborated by previous studies[14–17] and maybe accounted for by increased referrals from the surgical outpatient department. In Africa, women rarely come for screening mammography, except if a screening program is ongoing, like in our study. To encourage eligible women to come for screening during this study, the cost of mammography was reduced by 50%, to about 5 dollars and Breast ultrasonography was without cost to the patient.

Understanding the implication of normal Breast density is essential to the interpretation of mammography. Heterogeneously dense breast pattern has the highest prevalence in this study accounting for 40.8% of the study participants. This is in agreement with earlier documented studies[18,19]. Most studies state that dense breast patterns (BI-RADS C and D) are the prevalent pattern in black women[20]. However, in a similar study in northwest Nigeria by Akande *et al*, dense breasts accounted for (16.9%)[21,22].

Our study showed that benign breast diseases (axillary lymph nodes, benign calcifications, fibroadenomas, lipoma, and oil cysts) are the most common finding, which is similar to previous studies on breast mammography[13,22,23].

The outcome of most mammograms is to determine the probability of malignancy. The most prevalent final category assessment in our study is

BI-RADS 2, which implies benignity with less than a 10% probability of malignancy[7,9,10,24].

Extremely dense and heterogeneously dense breast patterns are difficult to evaluate by mammography alone as small lesions may be obscured and need further evaluation with ultrasonography. BI-RADS 0 accounted for 20% of our study, it is pertinent to observe that most patients with BI-RADS 0 also fall within the prime age of 40-59 years, the age when these women are highly productive to their families and the nation.

In this study, 13 out of the 51 (25%) cases of inconclusive study, came for follow-up ultrasound. 38 (75%) patients were lost to follow-up, out of which we successfully interviewed 18 patients. Shockingly a major reason for defaulting was that the women were not properly advised by the Radiologist of the implication of BIRADS 0, as in most busy departments when patients come for results, they are usually attended to by non-medical staff and the women are not counselled and therefore do not understand the clinical implications of their results. Also, some referring physicians did not encourage the patients to come for follow-up and some told the women with BIRADS 0 that the result was perfect and did not need further imaging. Other reasons are fear and procrastination, only 3 women adduced defaulting follow-up on finances. This implies that the Radiologist should not only explain in detail to the patient but must endeavour to communicate with the referring physician. Most studies have shown that physician recommendation is the most important factor for women to perform mammography[25]. In our study, we lost about 75% of the women to follow-up, despite not including BIRADS categories 3 and 4. In advanced countries, the rate of loss to follow-up is between 20-35 %[26]. Akande *et al* in their study in the North Central part of Nigeria also noted that more than 70% of cases of BIRADS 0 and BIRADS 3 were lost to follow-up[27].

The commonest normal density pattern of the Breast in our study was heterogeneously dense breast in the age range 40-50 years. This implies that a large percentage of our screening studies will be classified as BI-RADS 0. This age group is usually the target for screening studies in Africa, which implies that to make screening for breast cancer effective in Africa, educating women goes beyond identifying breast lumps, but should include knowledge of normal breast density patterns, and the clinical implications of BIRADS categories, especially BIRADS 0.

Conclusion
There is a need to increase the awareness of regular mammograms for screening purposes in Sub-Saharan African. Also, more importantly, women should be educated to understand the implication of BIRADS Category 0 and the various normal breast density patterns and its implication on diagnosis by mammogram.

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