Screening Mammography Findings among Some Nigerian Women

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Authors' contributions

This work was carried out in collaboration between all authors. Author AOA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors RAA and EOI managed the analyses of the study. Author EOI managed the literature searches. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Background: Screening mammography is currently the most effective and reliable Imaging method for early detection of breast cancer in women, when it is most treatable, thus reducing the health burden and mortality arising from breast cancer.
Objective: This study was to assess the findings on mammograms of women who came for routine screening mammography.
Design: A prospective descriptive multiple centre Study.
Setting: Sharon Radio- Diagnostic Centre, in Benin City and Lagos State University Teaching Hospital, Lagos. (LASUTH)
Subjects: All the 242 asymptomatic women who presented for screening mammography over a four year period (2010-2013).
Results: A total of two hundred and forty-two women were screened, and the mean age of the study population was 48.93 ± 8.0 years with age range of 25 to 76 years. Majority of the women who came for mammography screening were in the 40 to 50 years age range, making up 60.7% of the study population and the predominant breast parenchyma pattern was scattered fibroglandular

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densities (56.6%). Seven eight women making up 32.2% of the total population had positive findings on their mammograms, however only 7 women about 2.9% appeared significant and needed biopsy to rule out malignancy. Majority of the mammograms had BIRADS category 1 (52.5%), which implied nothing was found and so they were normal. The Parenchyma pattern had statistically significant correlation with age (p<0.001).

Conclusion: The percentage of probably malignant findings was low in this study and better outcome is expected from such screening detected lesions. Therefore effort should be made to encourage women to embrace screening mammography as a routine investigation, as its role in reducing breast cancer mortality cannot be overemphasized.

1. INTRODUCTION

Screening mammography refers to mammography done for asymptomatic women of appropriate age group, while diagnostic mammography is done for patients of both sexes who present with signs and symptoms of breast disease.

The sole aim of screening mammography is to detect sub-clinical breast cancer and since no cure has been found for breast cancer, early detection through screening has been reported as the only way to reduce mortality [1-4].

Mammography is currently the most effective imaging method for early detection of breast cancer and a reliable method for detecting non-palpable or occult breast cancer [5].

Breast cancer is known as one of the most common cancers affecting women worldwide and it has been reported as the second principal cause of cancer deaths in women worldwide even in Nigeria [6-8].

Various studies on knowledge, attitude and practice of breast cancer screening among different groups of Nigerian women have shown very low reports of mammography use. A study by Odusanya Olumuyiwa et al. [9], among nurses in Lagos showed mammography use of 8% and another study among health workers in Benin City by Akhigbe et al. [10], reported mammography use of only 3.1% among those above 40 years, who qualify for screening mammography. A low screening mammography (15.3%) use compared with diagnostic mammography (84.7%) was also reported in Benin City in another study on pattern of utilization of mammography [11]. This low screening mammography use is in contrast to what obtains in developed countries where overall mammography use is higher and more for screening, with screening rates above 70% in UK and USA [12].

The low mammography use both for screening and diagnosis impacts negatively on breast cancer survival rate among Nigerian women, as they tend to present late for treatment and this has been, observed in previous studies [13,14,15].

High level of cancer fatalism among Nigerian women has also been found to have negative effect on cancer screening behavior in a previous study [16].

The Nigerian health system is almost non-functional as majority of the people cannot access good qualitative health care. The National Health Insurance Scheme coverage is very low, only 7.9 million of the estimated 193 million Nigerians are covered [17]. WHO reported that private spending on health as a percentage of total health expenditure in Nigeria was 63.3%. Of this 95.4% was from out-of-pocket payment, indicating that a majority of Nigerians especially the poor have to pay for their healthcare [18]. Mammography is relatively expensive, most women cannot access this investigation for breast cancer screening. This has been a major setback limiting women from routinely accessing mammography which is one of the recommended methods of breast cancer screening. There is no standard recommendation for routine mammography screening in Nigeria and no comprehensive health insurance cover yet. However in the USA, routine screening usually begins at the age of 40 years and repeated at one year interval and in countries where mammography screening is centrally organized into national, state or provincial programs funded entirely by government, they tend to start at 50 years with follow-up at 1 to 2 years interval [19].

The aim of this study is to assess the findings on mammograms of women who came for routine screening mammography over a period of 4 years at a private breast imaging facility in Benin City and Lagos State University Teaching Hospital, Lagos. (LASUTH).

2. METHODS

A total of two hundred and forty-two women (242) who presented for screening mammography between January 2010 and December 2013 were included in this study. This was made up of one hundred and forty-one women from the breast imaging section of Sharon diagnostics, a private radio-diagnostic centre in Benin Cityand one hundred and one women from the breast imaging section of the Department of Radiology of Lagos State University Teaching hospital (LASUTH), Lagos.

Each respondent had the conventional cranio-caudal and medio-lateral oblique views of both breast using Siemens mammomat 3000 NOVA at the Benin centre and GE Alpha ST Mammography machine at LASUTH. The mammograms were reviewed by two consultant Radiologists who are breast imaging specialists in the two study centers. The American College of Radiology, Breast Imaging and data systems (ACR-BIRADS) lexicon was used in reporting the mammograms.

According to the BIRADS lexicon, the breast parenchyma pattern was classified into the 4 types, namely; [1] almost entirely fatty [2] scattered fibroglandular densities [3] heterogeneously dense [4] extremely dense. Calcifications, if any were classified into macro-calcifications which are commonly benign and micro-calcifications, with higher probability of malignancy. Masses were classified as benign or malignant based on level of suspicion of mammographic features. Parenchyma asymmetry was also recorded according to the BIRADS classification. Axillary and intra-mammarylymphadenopathy were recordedand the final category ranging from 0 to 6 were considered on the mammogram reports.

These findings were collated and analyzed using SPSS version 16 (SPSS Inc, Chicago, IL, USA) and the differences were considered significant at $p \leq 0.05$ at 95% confidence interval.

3. RESULTS

A total of two hundred and forty-two women were screened, and the mean age of the study population was 48.93 ± 8.0 years with age range of 25 to 76 years.

Majority of the women who came for mammography screening were in the 40 to 50 years age range, making up 60.7% of the study population followed by 51 to 60 years age range (27.3%), Table 1. Few women under 40 years (9 {3.7%}) were included due to earlier screening recommendation for women with strong family history of breast cancer. The predominant breast parenchyma pattern was scattered fibroglandular densities (56.6%), followed by almost entirely fatty parenchyma (31.0%). Parenchyma pattern had statistically significant correlation with age ($p<0.001$) (Table 1)

The commonest finding was lymphadenopathy, making up 34.4% of the findings, followed by mammographically benign masses making up 24.4%. None of the findings were statistically significant (Table 2). A total of 78 (32.2%) positive mammogram findings were reported, however, 7 mammographically significant lesions were found making up 2.9% of the study population for which biopsy and histology were recommended to rule out malignancy (Table3). Out of the mammographically significant findings, 2 were from the LASUTH group while 5 were from the Benin group, giving 0.8% and 2.1% contribution respectively to the mammographically significant findings.

Table 1. Age distribution and breast parenchymal patterns

Age range	Almost entirely Fatty(n)	Scattered fibroglandular(n)	Heterogenously dense(n)	Extremely dense(n)	P-value
<40 years	0	7	2	0	<0.001
40-50	33	89	21	4	
51-60	31	34	1	0	
61-70	6	7	2	0	
71-80	5	0	0	0	
Total	75 (31%)	137(56.6%)	26 (10.7%)	4(1.7%)	

For the final BIRADS categories (Table 3), Majority of the mammograms had category 1 (52.5%), which implied nothing was found and so they were normal (Figs 1A & 1B). This was followed by category 2 (19.4%), which implied benign findings. The category 0 mammograms were inconclusive cases that needed further imaging. The mammograms under category 3 were considered as probably benign and had short interval follow-up mammography recommendation. The categories 4 and 5 mammograms were suspicious of malignancy with category 5 having higher probability of malignancy and had biopsy recommendations. Being a screening study, no BIRADS 6 was expected because this category is for post-biopsy mammograms in histological proven malignancy.

4. DISCUSSION

The main aim of screening mammography is early diagnosis of breast cancer at the subclinical stage when cure is possible.

The significant parenchyma patterns in the study population were scattered fibroglandular densities and almost entirely fatty, which are favorable for adequate assessment of breast lesions as no caveat is usually included under the ACR-BIRADS lexicon for such patterns ([20]). However breast parenchyma pattern was also an indication of level of breast cancer risk among the women, as recent studies have implicated breast parenchyma pattern in breast cancer risk factors [21-23]. Notification of breast parenchyma pattern associated with increased risk of breast cancer has been passed into law in over 12 states in the USA, requiring that patients with heterogeneously dense and extremely dense breasts parenchyma receive notification about their breast density in lay letters that are sent after the screening mammogram and supplementary breast cancer screening may be advised [24]. Therefore, women with heterogeneously dense and extremely dense parenchyma patterns are expected to be informed so that more sensitive screening tests are applied for such women. These are also the group of women who commonly fall under BI-RADS category zero in the initial assessment because they usually will require further imaging [20]. In this study, 30 (12.4%) women had heterogeneously dense breast parenchyma pattern which required further investigation. They were all referred for breast Ultrasound for further evaluation. The 3D mammography and magnetic resonace imaging (MRI) are relatively new, expensive and not readily available.

Table 2. Age group and mammogram findings

Age range	Benign mass (n)	Highly suspicious mass(n)	Microcalcification (n)	Macrocalcification (n)	Focal asymmetry (n)	Lymhadenopathy (n)	Parasitic calcification (n)
<40	0	0	0	0	0	3	0
40-50	20	1	2	2	10	21	2
51-60	8	3	6	6	7	16	3
61-70	4	1	1	5	3	5	1
71-80	0	0	0	1	0	0	0
Total	32	5	9	14	20	45	6
P-value	0.195	0.329	0.292	0.882	0.157	0.153	0.136

Table 3. Age distribution and birads categories

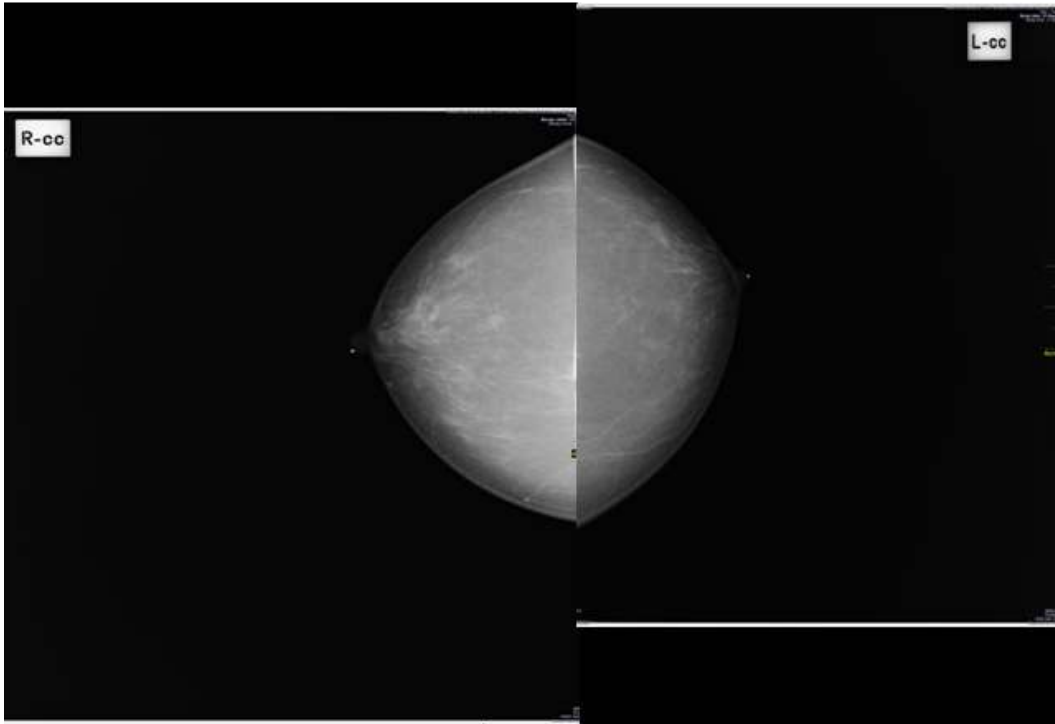| Age range	Birads 0 (n)	Birads 1 (n)	Birads 2 (n)	Birads3 (n)	Birads4 (n)	Birads5 (n)	Birads6 (n)	P-value
<40	1	4	3	0	0	0	0	0.607
40-50	28	77	22	12	5	1	0	
51-60	5	37	16	11	0	1	0	
61-70	3	5	5	1	0	0	0	
71-80	0	4	1	0	0	0	0	
Total	37(15.3%)	127(52.5%)	47(19.4%)	24(9.9%)	5(2.1%)	2(0.8%)	0	

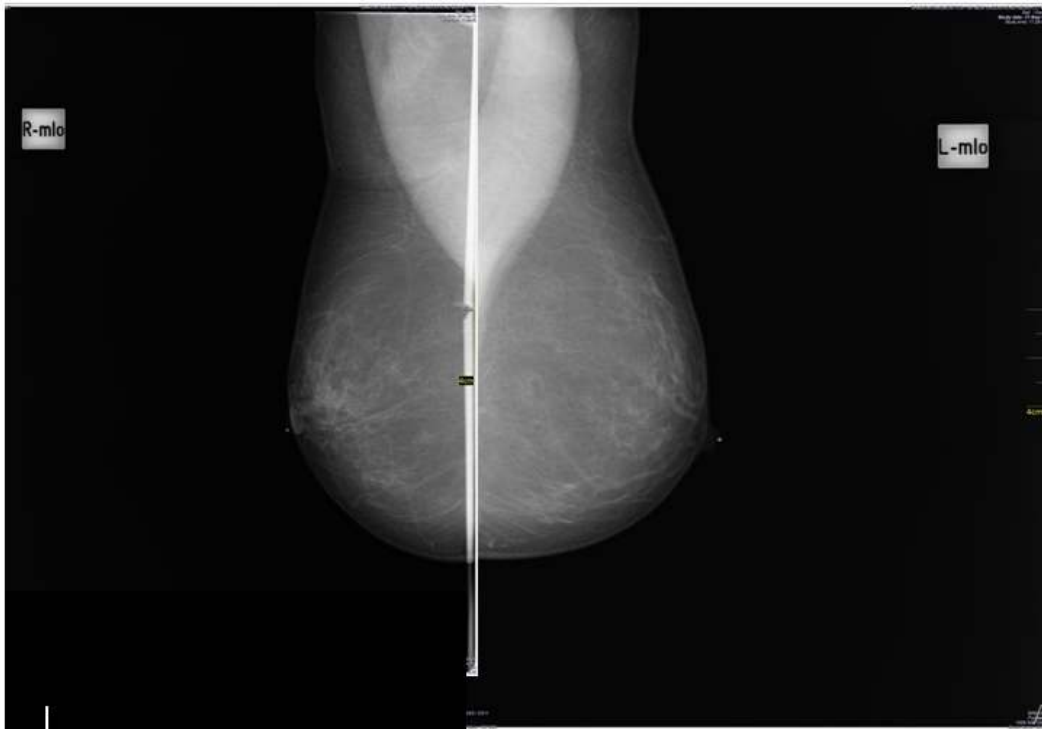**Fig. 1A. CC views of a normal mammogram**

Fig. 1B. MLO views of a normal mammogram

About 78 women, making up 32% of the screened population had positive findings on their mammograms, however only about 2.9% of the positive findings appeared significant and needed biopsy to rule out malignancy. This is similar to reports from other screening studies like the Irish National Breast Screening Program using double reading and consensus review in Ireland between 2000 and 2005, which showed cancer diagnosis rate of 7.33% in a study which involved 128,569 women [25].

In a Brazilian study on outcome of a screening mammography practice involving symptomatic and asymptomatic patients, the breast cancer detection rate was 0.34% in screening patients and 3.91% in symptomatic patients, while biopsy recommendations among screening patients was 1.7% [26]. The biopsy recommendation rates in the Brazilian study among the screening patients is similar to the biopsy recommendation in the present study (1.7% vs2.9%).

5. CONCLUSION

Though the percentage of probably malignant lesion was low, the study confirm that screening mammography can detect probably malignant lesions of the breastwith the possibility of early intervention and good outcome for our women.

6. RECOMMENDATION

Massive awareness should be commenced to educate the women on the need to embrace the routine mammography screening method for breast cancer, this can be achieved by the government provision of universal and comprehensive health insurance coverage for all Nigerias.

7. LIMITATION OF STUDY

There was no biopsy and histological correlation of the lesions seen on the mammograms, therefore the likelihood of the findings being significant was based on the features on mammograms and the ACR-BIRADS lexicon categorization. Also the lack of access to health insurance scheme by a majority of the women made the use of the modality for screening very low.

CONSENT

It is not applicable.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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