Original Article

Mammographic Practice in Sokoto: An Overview of the Diagnostic and Screening Findings

M. B. Sule[1], S. A. Sa'idu[1], S. M. Ma'aji[1], M. Danfulani[1], G. H. Yunusa[1], A. U. Umar[2], I. H. Gele[1]

[1]Department of Radiology, Usmanu Danfodiyo University, Sokoto, Nigeria, [2]Department of Radiology, Gombe State University, Gombe, Nigeria

ABSTRACT

Background: Breast cancer has been reported as the most common cancer in women and the second leading cause of death from cancer in adult females. The incidence of breast cancer has been steadily rising since the 1980s which has been attributed to increased awareness and availability of mammographic facility. **Aim and Objective:** A descriptive and retrospect study on 200 adult females referred for either diagnostic or screening breast mammography at the mammographic suite of Usmanu Danfodiyo University Teaching Hospital Sokoto between December 2010 and November 2012. This study aims to compare the outcomes following both screening and diagnostic mammography within the stated period. **Materials and Methods:** This was a retrospective study on 200 adult female patients referred for either screening (77) or diagnostic (123) breast examination at the mammography suite of UDUTH Sokoto between December 2010 and November 2012. **Results:** The prevalence of diagnostic and screening mammography in Sokoto within the study period was found out to be 61.5% and 38.5%, respectively. **Conclusion**: Abnormalities found following diagnostic and screening mammographic examination were estimated at about 49.6% and 33.8%, respectively.

Key words: Breast cancer, Mammography, Females, Sokoto

INTRODUCTION

Mammography is a radiographic imaging technique for screening and diagnosis of breast pathologies using low-energy ionizing radiation in the range of 20–35 KV. Mammography has a high sensitivity and specificity, with relative affordability, availability, and non-operator dependence making it of advantage over ultrasonography and magnetic resonance imaging.[1,2]

Mammography is the single most important imaging technique in diagnosing breast diseases and applicable in screening and diagnostic aspect. The diseases either present as architectural distortion as in carcinoma and radial scar, circumscribed masses such as lipoma, lymph node, and fibroadenoma with calcifications, microcalcifications.[2-4]

Mammography has a sensitivity of about 90%, this implies that carcinomas which are otherwise symptomatic at the time of mammographic examinations are not detected by mammography, this sensitivity is excellent in fatty tissue and decreases as the radiodensity increases.[3]

The sensitivity of mammography as a screening and diagnostic tool is mainly influenced by the density of the breast parenchyma, the breast parenchyma density refers to the prevalence of fibroglandular tissue in the breast as it appears on a mammogram.[5,6]

Breast density is an important factor in the development and risk of breast cancer, the denser the breast tissue, the greater the risk of breast cancer.[6] Denser breast tissue

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Address for Correspondence:
Dr. Sule Muhammad Baba, Department of Radiology, Usmanu Danfodiyo University, Sokoto, Nigeria. Phone: +2348035960328. E-mail: muhammadsule@yahoo.com

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can lower mammographic sensitivity and obscure a lesion mammographically.[3-6]

Mammography is described as a standard examination for women undergoing either symptomatic or screening examination and usually consists of standard views which are lateral oblique and craniocaudal (CC) views of each breast with supplementary views such as lateral (lateromedial and mediolateral [MLO]), extended CC (medially or laterally), magnification, localized compression, and cleavage views.[4]

The breast imaging, reporting, and data system (BIRADS) Lexicon was introduced by the American College of Radiology (ACR) to provide a clear and concise way to report the mammographic results.[4-6] A BIRADS category is reported at the end of every mammogram report.

Screening mammography is a radiographic examination of the breast performed for early detection of breast cancer in asymptomatic women. The ACR recommends that women should have mammography at the age of 40 years and annually thereafter.[7]

MATERIALS AND METHODS

This is a descriptive and retrospective study of 123 adult females who came for diagnostic mammography and 77 adult females who had screening mammography between December 2010 and November 2012 at the mammographic suite of the Radiology Department UDUTH. Ethical approval for the study was obtained from the Research and Ethical committee of Usmanu Danfodiyo University Teaching Hospital Sokoto (UDUTH/HREC/56; dated August 8, 2012).

Within the stated period, 123 had diagnostic and 77 females had screening mammography in the department with the General Electric (GE) Alpha-RT machine with model number MGF-101 and serial number 34160 (manufactured 2010). All the subjects had to fill a mammographic form consisting of variables such as age, sex, occupation, and tribe.

MLO and CC views were done for the breast examination though spot compression views were occasionally employed.

The inclusion criteria include mammograms from adult females that had diagnostic and screening mammographic examination. While the exclusion criteria basically excluded mammograms from patients without adequate clinical information and reasons for the examinations, and mammograms from those aged less than 30 years of age due to dense breast (this reduces mammographic sensitivity).

The data obtained were analyzed using Statistical Package for the Social Sciences (SPSS) version 17. Analysis began with descriptive statistics (mean and SD) for quantitative data (age, BIRADS category) and frequencies with percentages for qualitative data (sex, tribe, and breast density). This was followed by inferential statistics (Chi-square test) to determine association between age and breast density for diagnostic and screening mammography.

The results were presented in the form of text and occasionally tables. All statistical tests were carried out using two-tailed tests, with level of significance set at 0.05.

RESULTS

Demographics

Diagnostic mammography: Mammograms from 123 adult females were analyzed, the age range is 30–59 years with a mean of about 42.7 ± 8.3. The Hausa tribe dominated by a percentage of about 85.4% (105) and predominantly housewives; 71.5% (88 subjects); Table 1.

All the cases were referred by a hospital physician with source of information about mammographic examination from the hospital.

Screening mammography: Mammograms from 77 adult females were analyzed, the age range is 40–59 years with a mean of about 45.7 ± 5.4. The Hausa tribe dominated by 51.9% (40) and predominantly housewives; 89.6% (69 subjects); Table 2.

All the cases were referred by a hospital physician with source of information about mammographic examination from the hospital.

Table 1: The age group of the subjects that had diagnostic mammography.

Variable	Frequency, *o* (%)
Age group (years)	
30–39	36 (29.3)
40–49	57 (46.3)
50–59	30 (24.4)
Total	123 (100)

(The most frequent age group for those that had diagnostic mammographic examination was the 40–49 years age group. The mean age is 42.7 ± 8.3)

Table 2: The age group of the subjects who had screening mammography

Variable	Frequency, *o* (%)
Age group (years)	
40–44	33 (42.9)
45–49	27 (35.1)
50–54	10 (13.0)
55–59	7 (9.1)
Total	77 (100)

(The most frequent age group that had screening mammography was the 40–44 age category while the 55–59 age category had the least. The mean age is 45.7 ± 5.4)

Prevalence of Mammography

Diagnostic mammography

The prevalence of diagnostic mammography within the study period was found out to be about 61.5%.

Screening mammography

The prevalence of diagnostic mammography within the study period was found out to be about 38.5%.

Mammographic Outcomes

Diagnostic mammography: The mammographic findings were broadly classified as either normal or abnormal mammographic findings. The normal findings were 50.4% (62 subjects) and abnormal in 49.6% (61 subjects), respectively.

The abnormal diagnostic mammographic outcomes; masses in either or both breasts in 36.6% (45 subjects), architectural distortion in either or both breasts in 8.1% (10 subjects), isolated calcification in either or both breasts in 3.3% (4 subjects), and retracted left and right nipple in 0.8% (1 subject each), respectively. Some of the abnormal findings are shown in Figure 1.

Screening mammography: The mammographic findings were broadly classified as either normal or abnormal mammographic findings. The normal findings were 66.2% (51 subjects) and abnormal in 33.8% (26 subjects), respectively. Normal screening mammogram is shown in Figure 2.

The abnormal screening mammographic outcomes; architectural distortion in either or both breasts in 16.9% (13 subjects), masses in either or both breasts in 14.3% (11 subjects), and isolated calcification in either or both breasts in 2.6% (2 subjects).

BIRADS – Classification of Mammographic Outcomes

Diagnostic mammographic outcome: BIRADS classification:
1. BIRADS-0 Category; 23 subjects (18.7%)
2. BIRADS-1 Category; 62 subjects (50.4%)
3. BIRADS-2 Category; 14 subjects (11.4%)
4. BIRADS-3 Category; 9 subjects (7.3%)
5. BIRADS-4 Category; 6 subjects (4.9%)
6. BIRADS-5 Category; 9 subjects (7.3%).

Screening mammographic outcome: BIRADS classification
1. BIRADS-0 Category; 24 subjects (31.2%)
2. BIRADS-1 Category; 51 subjects (66.2%)
3. BIRADS-2 Category; 2 subjects (2.6%).

Mammographic Breast Density

Breast densities were categorized similar to that done by the ACR into BIRADS Category 1–4.

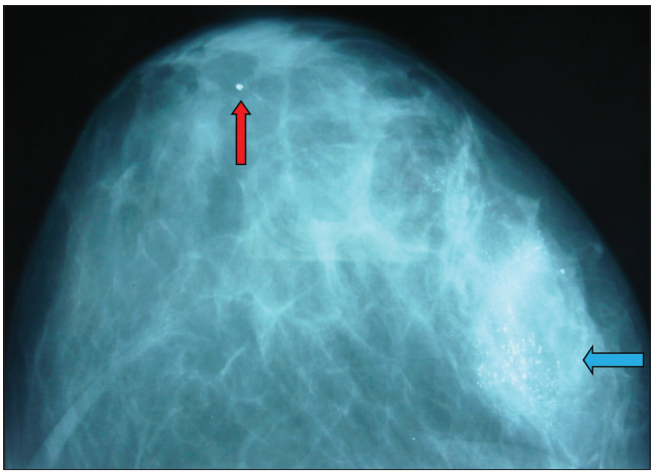

Figure 1: A cranio-caudal view of a female right breast following diagnostic mammography on account of breast pain. This is a predominantly fatty breast showing the following: Up red arrow: Solitary macrocalcification in the retro-areolar region. Left blue arrow: Clumps of macrocalcifications and architectural distortion

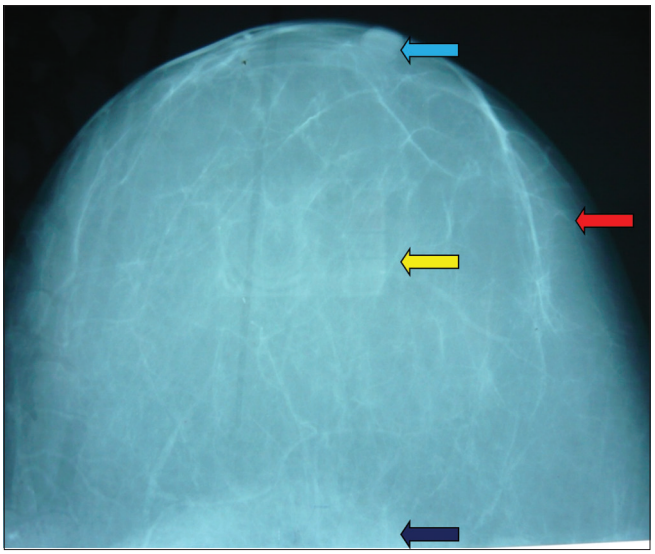

Figure 2: A cranio-caudal view of the left breast following screening mammography. This is a fatty breast with a normal mammographic finding (BIRADS-1); this shows a normal mammographic anatomy. Left blue arrow: Nipple. Left yellow arrow: The mammary dome.Left black arrow: Pectoralis muscle shadow. Left red arrow: The skin

Diagnostic Mammographic Breast Density

The most predominant breast density category was BIRADS-1 category; entirely fatty breast and found in 54 subjects (43.9%).

Screening Mammographic Breast Density

The most predominant breast densities category were BIRADS-1 category; entirely fatty breast found in 32 subjects (41.6%) and BIRADS-2 category; heterogeneous breast density found in 32 subjects (41.6%) also.

Statistical Associations

Diagnostic mammography

The relationship between age and mammographic breast density: In this study, it was found that age had a statistically significant association with breast a p-value of 0.00.

Screening mammography

The relationship between age and mammographic breast density: In this study, it was found that age had a statistically significant association with breast a $P = 0.03$.

DISCUSSION

The prevalence of diagnostic mammography was found to be 61.5%. This agrees with the study of Awosanya.[2] The most frequent presenting complaint for those who had diagnostic mammography were breast lumps and pain in either or both breasts which were in conformity to the aforementioned studies.[2,8] This is probably due to the same geographical location, race, and almost similar cultural practices.

In this study, it was found that most of the subjects came for diagnostic mammography rather than screening. Seventy-seven subjects had screening while 123 subjects had diagnostic mammography. Similar findings were also observed by Awosanya[2] and Akinola *et al*.[8] in Lagos, Nigeria. This is most likely from anxiety, lack of awareness of the benefits of mammographic screening, and cost implication.

The diagnostic mammographic findings were normal in 62 (50.4%) subjects while abnormal in 62 (49.6%) subjects. These similar mammographic outcomes were also reported by Awosanya[2] and Akinola *et al*.[8] most likely from same racial, geographical location, and cultural practices.

The preponderant BIRADS classification of mammographic findings in this study is BIRADS-1 and is in agreement with the study of Awosanya.[2] This varies from what Akinola *et al*.[8] reported from Lagos with their most frequent BIRADS classification of mammographic findings being BIRADS-2.

The prevalence rate of screening mammography was found to be 38.5% in Sokoto within the study period; this is similar to that reported by Rachael *et al*.[9] in Lagos Nigeria. This is lower when compared to that reported by Awosanya[2] and Akinola *et al*.[9] both in Lagos, Nigeria. This is probably due to availability of the facility before Sokoto and increased awareness of the benefits of breast screening in Lagos.

The awareness of mammography was observed to be very low in this environment; this is similar to that reported by Rachael *et al*.[9] in Lagos Nigeria, Obajimi *et al*.[10] in Ibadan, and Kiguli *et al*.[11] in Uganda probably due to inadequate mammographic facilities. This is in variance to that observed by many researchers in the Western countries where established mammographic practices exist.

The mammographic outcome from screening mammography was mostly normal and conformed to that reported by Awosanya[2] in Lagos Nigeria most likely because of same social, geographical location, and cultural practices. Mammographic breast density following screening was found to have a significant association with age; this conformed to the study of Obajimi *et al*.[12] in Ibadan Nigeria.

The preponderant BIRADS classification of screening mammographic findings in this study is BIRADS-1 and is in agreement with the study of Awosanya.[2] This varies from what Akinola *et al*.[8] reported from Lagos with their most frequent BIRADS classification of mammographic findings being BIRADS-2.

CONCLUSION

The prevalence of screening and diagnostic mammography in Sokoto is 38.5% and 61.5%, respectively, both screening and diagnostic mammography can detect various forms of breast pathologies which were mostly breast masses, calcifications, and architectural distortions

RECOMMENDATION

It is highly recommended that public awareness of the benefits of mammographic practices should be encouraged by non-hospital-based avenues like the media (TV and radio adverts), public lectures and seminars, fliers, and places of worships.

An established mammographic practice and awareness centers for the prevention on breast cancers, especially among women, should be established throughout the country to reduce the burden of cancer and its mortality which is on the increase in Nigeria.

Adequate training of health-care providers on the benefits of mammography as a screening technique for the prevention of breast cancers and other breast pathologies is highly recommended in Sokoto and across the country.

The government should subsidize the fee for mammographic examination or even make it free so as to encourage more patronage and effective utilization of the already available mammographic facilities nationwide.

Finally, it is also recommended that mammographic examination should be encouraged for females from the age of 30 years for diagnosis and 40 years onward for screening.

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