

Original Article

Mammographic Findings of Breast Cancer Screening in Patients with Positive Family History in South-East Nigeria

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ABSTRACT

Background: A positive family history of breast cancer is an important risk factor associated with the development of breast cancer in women. Early detection required regular screening in these women. **Objective:** To determine the mammographic findings of breast cancer screening in patients with a positive family history in Iyenu, Southeast Nigeria. **Methodology:** Forty-three consenting females with a positive family history of breast cancer who underwent mammographic screening at Radiology Department, Iyenu Mission Hospital, Anambra State, were enrolled in the study. Mammographic findings were compared with those of females with a negative family history. **Results:** The mean age was 49.6 years with a range of 35–69 years. The mammographic findings were asymmetric density, nipple retraction, tissue retraction, skin thickening, lymphadenopathy, and calcification within a mass with varying frequency for the right and left breasts. **Conclusion:** A significant statistical difference was found in lymphadenopathy and calcification for the right and left breasts, respectively, when compared with those without positive family history.

KEYWORDS: Breast cancer, positive family history, screening mammography

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INTRODUCTION

Breast cancer is the most common cause of death from cancer in women worldwide, with estimated 1,671,149 new cases of breast cancer identified and 521,907 cases of deaths due to breast cancer which occurred in the world in 2012.^[1,2] Breast cancer incidence in developed countries is higher while relative mortality is greatest in less developed countries.^[2] However, increasing life expectancy, urbanization, and adoption of western lifestyles have been found to account for rising incidence in developing countries.^[3]

In developed countries, it tended to occur more commonly at a younger age.^[4-6] In a country like Nigeria, the rising incidence of breast cancer is complicated by late presentation which marks breast cancer diagnosis in Nigeria, with about 70% of cases presenting at advanced stages of the disease.^[7,8] Late breast cancer diagnosis is common in countries with limited resources.^[9,10] However, early diagnosis has been proven to reduce mortality and improve diagnosis.^[11,12] Early detection

requires early diagnosis in symptomatic women and regular screening in asymptomatic women.^[9]

In the recent past, breast cancer screening in Nigeria mainly consisted of self-breast examination and clinical breast examination.^[13] Previous studies have shown lower sensitivity of these approaches for breast cancer.^[13-17]

Mammographic screening is relatively new in the developing world, and the capacity to perform mammography is gradually becoming widespread in Nigeria.^[18] However, the available mammography services are found more in the private centers. Evidence abounds that mammography is an effective screening tool, especially for women aged above 40 years.^[14,15]

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A positive family history of breast cancer is an important risk factor associated with the development of breast cancer in young women.^[19] In general, women with a first-degree family history affected by the disease have more than twice the risk of developing breast cancer as the general population.^[20-23] For women whose mother was diagnosed at or before age 30 years, the relative risk is 9.4 as compared to women without family history.^[24] Having multiple family members affected further increases the risk, risk of 17.1 for a mother and two sisters diagnosed by the age of 50 years compared to no family history of breast cancer.^[24]

Approximately 5%–10% of all newly diagnosed breast cancers in western nations are hereditary, attributable primarily to inherited mutations in the BRCA1 and BRCA2 gene. According to a recent meta-analysis, BRCA1/2 gene mutations are associated with 40%–57% lifetime risk of female breast cancer.^[25] It is also established that BRCA1/2 carriers with breast cancer have elevated risks of contralateral breast cancer of approximately 50% at 25 years postdiagnosis.^[26,27] Nixon *et al.*^[28] reported a significantly higher proportion of high-risk mammographic patterns in associations with family history among women aged 40–49 years.

Duffy *et al.*^[29] also reported that annual mammography in women aged 40–49 years with a significant family history of breast or ovarian cancer is both clinically effective in reducing breast cancer mortality and cost-effective.

Studies on mammography in Nigeria are found in the literature but few on mammographic screening.^[18,30-35] None to the best of our knowledge has been reported on mammographic screening findings in patients with a positive family history of breast cancer in our environment, thus the reason for carrying out this study. This study aimed at determining the mammographic findings of breast cancer screening in patients with positive family history. Further, a significant difference between their findings and the findings in those without a family history was documented.

METHODOLOGY

This study was carried out among 43 consecutive females with a positive family history of breast cancer out of 544 women who underwent mammographic screening in the Radiology Department of Iyenu Mission Hospital, Anambra State, Nigeria, between March 2014 and March 2017. Detailed history and risk assessment as well as clinical examinations were done by a clinician (surgeon) before referring for screening mammography. Inclusion criteria for mammographic breast screening were asymptomatic women aged 40 years and above and asymptomatic younger women

with a family history of breast cancer. Exclusion criteria were women with breast discharge, breast pain, breast skin discoloration, or axillary swelling. History of breast or gynecological cancer in mother, sister, or maternal aunt was also obtained from the women and this aided their recruitment for the study. Surgical history as well as hospital admissions was obtained. History of breast cancer in the relatives mentioned above was confirmed from accompanying relatives. Furthermore, women were examined by the clinician (consultant surgeon). Clinical information was recorded in a predesigned data sheet. Radiologists were blinded to the clinical history. Imaging findings with equivalent Breast Imaging Reporting and Data System (BIRADS) category were documented. Data generated were analyzed using Statistical Package for the Social Sciences (SPSS) Software, IBM corp., Released 2012, IBM SPSS Statistics for Windows, Version 21.0 Armonk NY: IBM Corp. Intra-observer variability was symptoms and known cases of breast cancer. Mammographic examination was done with two standard views (craniocaudal and mediolateral oblique) and additional views such as spot compression, magnification view, cleavage view, and exaggerated craniocaudal view where necessary. The mammograms were reported by two radiologists with special interest in breast radiology. Age was retrieved from the request forms or directly from the patients. Any previous history of breast lump, nipple discharge, breast pain, breast skin discoloration or axillary swelling were obtained. History of breast or gynaecological cancer in mother, sister or maternal aunt were also obtained from the subjects and this aided their recruitment for the study. Past surgical history as well as past hospital admissions were obtained. Past history of breast cancer in relatives mentioned above were confirmed from accompanying relatives. Furthermore, subjects were examined by the clinician (surgeon). Clinical information was collected by the clinician and recorded in a pre-designed data sheet. To check intra-observer variability, each radiologist had a double reading of each mammogram. Thereafter independent interpretation and exchange of mammograms for reporting by two radiologists to check inter-observer variability was done.

RESULTS

The study population had a mean age of

Table 1: Age distribution

Age group (years)	Frequency (%)
31-40	10 (23.3)
41-50	16 (37.2)
51-60	12 (27.9)
61-70	5 (11.6)
Total	43 (100.0)

Table 2: Mammographic findings of the left breast

Mammographic findings in the left breast	No family history (n=501), n (%)	Positive family history (n=43), n (%)	χ^2	P
Asymmetric density	52 (10.4)	6 (14.0)	0.531	0.441
Nipple retraction	10 (2.0)	-	0.874	1.000*
Architectural distortion	7 (1.4)	0	0.609	1.00*
Calcification	94 (18.8)	14 (32.6)	4.737	0.03
Tissue retraction	4 (0.8)	-	0.346	1.000*
Skin thickening	9 (1.8)	2 (4.7)	1.629	0.213*
Lymphadenopathy	168 (33.5)	19 (44.2)	1.992	0.158
Calcification within a mass	6 (1.2)	-	0.521	1.000*

*Fisher's exact test otherwise Pearson's Chi-square test

Table 3: Mammographic findings of the right breast

Mammographic findings on the right breast	No family history (n=501), n (%)	Positive family history (n=43), n (%)	χ^2	P
Asymmetric density	53 (10.6)	2 (4.7)	1.531	0.295
Nipple retraction	10 (2.0)	1 (2.3)	0.022	0.599
Architectural distortion	5 (1.0)	0	0.433	1.000
Calcification	100 (20.0)	10 (23.3)	0.267	0.559
Tissue retraction	6 (1.2)	-	0.521	1.000*
Skin thickening	6 (1.2)	-	0.521	1.000*
Lymphadenopathy	159 (31.7)	21 (48.8)	5.231	0.022
Calcification within a mass	8 (1.6)	-	0.697	1.000

*Fisher's exact test otherwise Pearson's Chi-square test. $P \leq 0.05$

Table 4: Final Breast Imaging Reporting and Data System category

Final BIRADS assessment	Frequency (%)
0	5 (11.6)
1	5 (11.6)
2	22 (51.2)
3	7 (16.3)
4	4 (9.3)
Total	43 (100.0)

BIRADS=Breast Imaging Reporting and Data System

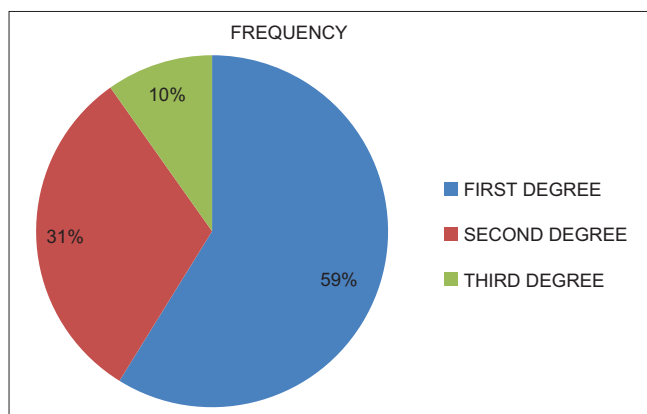


Figure 1: Degrees of family history

49.6 ± 9.1 years with an age range of 35–69 years. Women aged 41–50 years, i.e., 16 (37.2%), were of the highest frequency, followed by 51–60 years,

i.e., 12 (27.9%); the least fell within 61–70 years of age group, i.e., 5 (11.6%) [Table 1]. Women with the first-degree family history were of the highest frequency, i.e., 30 (58.8%), followed by second degree, i.e., 16 (31.4%) [Figure 1].

Mammographic findings were seen in both right and left breasts and compared with the findings of those who underwent screening but without a positive family history of breast cancer. Table 2 shows the statistically significant difference of left breast calcification for the two groups of participants ($P < 0.03$). Table 3 shows the significant statistical difference of right breast lymphadenopathy for the two groups of participants ($P < 0.022$). The most prevalent final BIRADS category was BIRADS 2 (benign), i.e., 22 (51.2%), followed by BIRADS 3 (probably benign), i.e., 7 (16.3%) [Table 4].

DISCUSSION

Mammography represents the cornerstone of breast cancer screening in the general population, especially in the age group of 50–70 years.^[36] It is the only breast screening modality that has been shown in large randomized trials.^[36,37]

A positive family history of breast cancer is an important risk factor associated with the development of breast cancer in young women as it can be related to the presence of a familial syndrome.^[19] About 7.9%

had a positive family history of breast cancer following the breast cancer screening performed. This is a little higher than 6.2% reported in a study done in Ibadan, Nigeria,¹⁸ but lower than reports among Caucasians with a prevalence rate of 26.4%.^[38] This may be due to higher awareness of breast cancer screening among Caucasians as well as resultant increased participation. The age distribution showed the greater percentage of women falling within the age group of >40 years with about one-fifth of the patients within age group of <40 years (23.3%). The presentation of these females earlier than 40 years for screening can be attributed to increasing level of awareness of breast cancer in our environment.

Early screening mammography ideally should be performed on women aged 40 years and above; however, according to the American College of Radiology, women with a positive family history of breast cancer are supposed to begin screening 10 years earlier than their family members who have/had breast cancer.^[39-41] A positive family history among first-degree relatives was found in 58.8% of women in our study which is higher than reported in the previous studies though this could not be attributed to any particular reason.^[42-46]

In the left breast, higher frequency in the three most predominant mammographic findings (asymmetric density, calcification, and lymphadenopathy) was found in patients with a positive family history when compared to those without family history. Likewise in the right breast, findings were almost similar though the particular finding with statistical significance varied. Statistical significant difference was found in calcification and lymphadenopathy for the patients with and without positive family history on the left and right breast, respectively.

This agrees with the findings of previous literature which reveals that women aged 40 years and above with a family history of breast cancer and abnormal mammograms actually have underlying pathology when compared with women without a family history of breast disease.^[47] This is contrary to the previous studies which revealed that despite the benefits associated with screening mammography, women who report a family history of breast cancer do not appear to have substantially different screening histories than women in the general population.^[48,49] However, there is a paucity of studies showing the screening mammographic findings in patients with a positive family history of breast cancer.

The most prevalent final BIRADS category was BIRADS 2 (benign), i.e., 51.2%, followed by BIRADS 3 (probably benign), i.e., 16.3%. The higher proportion

of BIRADS 2 and 3 follow the trend of higher incidence of benign breast lesions generally.^[46]

Although this is still less than the documented, over 70% of breast parenchymal lesions generally reported to be benign.^[50] The relative lower prevalence may be due to the fact that women recruited for this study were asymptomatic. Furthermore, the small sample size may have contributed to this. The limitation of this study was small sample size which is likely due to low acceptance for mammographic screening being the first of its kind in this environment despite widespread awareness created. In addition, the presence of other health institutions in this region may have contributed to the low response.

CONCLUSION

Despite the small sample size, this study revealed a statistical significant difference in right axillary lymphadenopathy and left breast calcification among those with a positive family history and those without. No statistically significant difference was seen among the other breast findings.

Recommendation

Following the findings of this study, screening for family-linked genes in relatives of those with breast cancer is still recommended though the nature of the calcification and lymphadenopathy was not included. Further studies involving details on the nature of calcification and axillary lymphadenopathy are also recommended.

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Conflicts of interest

There are no conflicts of interest.

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