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SCREENING FOR PREGNANCY ASSOCIATED BREAST CANCER AT NATIONAL HOSPITAL, ABUJA

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ABSTRACT

Breast cancer occurring during pregnancy presents a challenging clinical situation since the welfare of both the mother and the fetus must be taken into consideration in any treatment plan. It presents some difficulty in detection because of hormone-influenced tissue engorgement and the tendency to limit attention to the pregnancy itself. The need for early detection therefore is of paramount importance in order to prevent increased morbidity and mortality. Clinical assessment in pregnancy which entails breast and axillary examination might result in low detection rates because of changes in the breast during pregnancy and this may necessitate complimentary breast ultrasound scan for complete evaluation. A longitudinal comparative study involving antenatal clinic attendees at the National Hospital, Abuja was carried out between May 15, 2018 to February 22, 2019. A total of sixty four pregnant women participated in the study group. Sixty two (97%) of patients were aware of breast cancer. Three breast masses (4.7%) (two solid and one cystic) were detected in the antenatal period and two solid masses (3.1%) during post natal period. All solid masses detected in both ante natal and postnatal periods were detected by both clinical breast examination and breast ultrasound scan while the cystic mass was detected by breast ultrasound during the antenatal period only. Although more masses were detected with breast ultrasound scan than by clinical breast examination, there was no statistically significant difference between them, 3 versus 2; P=0.604. The histology report of the lesions showed fibroadenoma in all cases with masses, no breast malignancy was detected. We conclude that with increasing rates of breast cancer and late ages of childbearing, we will likely be faced with more cases of pregnancy associated breast cancer. Therefore, awareness and screening of breast cancer in pregnancy is of paramount importance so as to avoid late detection with its associated morbidity and mortality.

KEYWORDS: *Gestational breast cancer, breast cancer, Nigeria.*

INTRODUCTION

Breast cancer in pregnancy is the second most common cancer to occur in pregnancy after cervical cancer. Gestational breast cancer is defined as carcinoma that is diagnosed during pregnancy or within one year postpartum. The incidence of pregnancy associated breast cancer is approximately between 1.3 and 2.4 per 10,000 live births, which equates to 2-3% of total breast cancer.[1] The incidence is expected to increase as more women delay childbearing for socioeconomic reasons.[2] The increased vascularity and lymphatic drainage from the breast during pregnancy potentiate the metastatic spread of the cancer to the regional lymph nodes. Therefore, early detection and prompt management is the best method of reducing morbidity and mortality from it.[3] Pregnant women with breast cancer usually present similarly to non pregnant women, with a mass or thickening in the breast. Rarely, a milk rejection sign in the breast feeding mothers.[4]

The objective of the study was to screen for pregnancy associated breast cancer using clinical breast examination and breast ultrasonography.

METHODS

This was a longitudinal comparative study involving antenatal clinic attendees at the National Hospital, Abuja. After approval by the institutional review board of National Hospital Abuja, consecutive patients who meet the inclusion criteria were counselled on the purpose of the study, verbal and written informed consent was obtained. A structured questionnaire was administered and clinical based examination and breast ultrasonography were done at the antenatal booking clinic between 16-26 weeks gestational age (based on LMP) in the consenting pregnant women and same repeated at six weeks postpartum. Fine needle aspiration cytology was done in women with breast mass on clinical breast examination, breast ultrasonography or both to determine the characteristics of the mass.

The breast examination was done in the presence of a female chaperone. The patients were asked to sit up with their dress striped to the waist for adequate exposure, arms by the sides, and the shape, color, and skin characteristics of the breasts were observed. The skin was inspected for any retraction, ulceration, erythema, or crusting of the nipples. The nipples were noted if inverted, everted, or flat. Next, the patients were asked to raise their arms over the head. The movement of the breast tissue was noted as they do that. Tethering of breast tissue to the chest wall was checked for.

Breast palpation was started with the patient still sitting up using the flats of the finger, not the tips, for enhanced sensitivity and cognizant of the patient's nipple to avoid incidental contact with the hand was ensured. The palpation was done from superficial to deep, paying attention to the tissue at each level starting at the medial portion of the chest wall below the clavicle and progressing down and up in a "vertical strips" pattern and same was repeated on the opposite breast. Examination of associated structures were performed including supraclavicular and axillary nodal groups. The axilla was examined with the patient sitting upright. With the palm facing forward, the fingers were inserted into the axilla, just posterior to the pectoralis major and parallel to the plane of the muscle. The patient lowers her arm with the hand in place, and the palm was rotated perpendicular to the plane and sweeps downward.

The ultrasound evaluation was done by a Radiologist. The Philips HD 11 XE Ultrasound scanning machine, (Netherlands, 2006), with a linear probe with frequency Hertz of 12 was used for the breast sonography. The power Doppler was used to check the vascularity of the breast masses. The Grid scanning pattern entailed scanning up and down the breast in rows, making sure one overlap each row slightly to ensure no breast tissue is overlooked. Beginning in the upper outer quadrant, scanning in transverse direction. Sliding inferiorly from top to bottom, moving across and repeating the sweep inferior to superior. This was repeated across the breast. Then rotation into a sagittal plane and pattern repeated. In patients with larger or mobile breasts, the grid pattern quadrant by quadrant was applied. For Radial scanning pattern (clock-face), the breast was scanned and described as a clock-face. Beginning at 12'o clock position in a sagittal plane with the toe of the probe at the nipple. Depending on the breast size, a second pass further from the nipple may be required. Where breast pathology was identified, the probe was rotated 90^0 in the "anti-radial" pulse and images captured in two planes. The procedure was completed with the evaluation of the Axilla.

Those clinically suspicious breast masses were subjected to fine needle aspiration cytology (FNAC) for definitive diagnosis. This was carried out together with the pathologist in the pathology laboratory. After adequate patient counselling, the FNAC was performed by inserting a 21 to 27 G needle (attached to a 5, 10 or 20ml syringe) without ultrasound guidance, in the lump. The sample was then aspirated and then ejected into a slide and immediately smeared to obtain a more or less uniform film. The slide was then air dried and fixed in absolute alcohol before staining with Giemsa stain and Periodic Acid Schiff (PAF). Other smeared slides were fixed in absolute alcohol and stained with Haematoxylin and Eosin (H&E) and Pappanicolaou (Pap) stains. The slide was reviewed and reported together with the pathologist. Diagnosis was based on cellular architecture, cellular arrangement, smear background and nuclear appearances (size, shape, number and chromatin pattern).

The result was collated and data analyzed with the aid of Statistical Package for Social Sciences (SPSS) version 22. P value <0.05 at 95% confidence interval, was regarded as statistically significant between the two groups. Categorical variables were analyzed using Chi square test. Hypothesis testing was done to determine the statistically significant difference in cumulative incidence of breast masses detected by clinical breast examination and breast ultrasonography.

RESULTS

A total of 64 pregnant women who met the inclusion criteria for the study and gave informed consent were recruited for the study. They had breast examination and breast ultrasound scan done at booking and repeated at six weeks post partum. The age of the patients ranged from 20-42 years with a mean Age of 32.1 ± 5.34 standard deviation (SD). The mean gestational age at recruitment was 21 weeks and 4 days. 81.3% have tertiary level of education, 17.2% have secondary level of education and only 1.6% had primary education. Nineteen (29.7%) were of Igbo ethnic group, ten (15.6%) were Hausa, nine (14.1%) Yoruba, and twenty six (40.6%) were of other ethnic groups which included; Ebira, Kanuri, Igala and Edo. In terms of the occupational status of the study population, business women and Full time Housewives accounted for nineteen women (29.7%) each, civil servants accounted for eighteen women (28.1%) while professionals were eight in number (12.5%) which were the minority. Thirty patients (46.9%) were multiparous (2-4), Ten (15.6%) were primigravidae and only one (1.6%) was a grand-multiparous woman. This is shown in Table I.

Sixty two (97%) patients were aware of breast cancer as shown in Figure 1. Amongst the fifty four patients that have delivered before, twenty one patients (38.9%) had their first child between 25-29 years, fifteen (27.8%) between 30-34years and one (1.9%) had her first child at >35 years. Mean age at first childbirth was 26.35 ± 4.4 years. Age range from 19 to 37 years. This is shown in Table 2.

Fifteen patients (23%) used hormonal contraceptives which included oral contraceptive pills, medroxyprogesterone acetate and hormonal implants

while fourty nine (77%) have not used any form of hormonal contraceptive. Sixty three (98%) had no family history of breast cancer, colorectal or ovarian cancer and only one (2%) had a positive family history of breast cancer in maternal aunt. Sixty three (98%) patients do not smoke cigarette in any form while one (2%) did. Sixty women in the study group (94%) do not take alcohol but the remaining do take alcohol.

The association between risk factors and the detection of breast masses amongst the study population was assessed. There was a statistical association (P=0.031) in women with positive Family history of Breast, Ovarian, or Colorectal cancer and presence of breast mass. However, no statistically significant association was found amongst patients using hormonal contraceptives, with positive history of smoking tobacco or consumption of Alcohol and the presence of breast masses. This is as shown in Table 3.

Screening for breast masses was done using clinical breast examination and breast ultrasound scan. A total of three masses (4.7%) (two solid and one cystic) were detected in the antenatal period and two solid masses (3.1%) during post natal period. All solid masses detected in both ante natal and postnatal periods were detected by both clinical breast examination and breast ultrasound scan while the cystic mass was detected by breast ultrasound during the antenatal period only as shown in Table 4.

Table 5 shows the dimension of the masses. During the antenatal period, two women were found to have solid masses on clinical breast examination. The first woman had bilateral solid breast masses. The mass on the right breast measured 3x4cm and that on the left breast measured 1x2cm. Both masses were firm, freely mobile with no attachment to underlying or overlying structures. The second woman had a left solid mass that measured 1x2cm. It was also firm, freely mobile, with no attachment to the surrounding structures.

On breast ultrasonography, three lesions were detected in three patients. A cystic mass was found which was a left simple retroareolar cyst at 6'oclock position. It measured 0.57 x 0.47cm. The ultrasound scan also confirmed the presence of the two solid masses detected by clinical breast examination. The first patient with bilateral solid masses had a right and left breast masses, well-circumscribed, round to ovoid in shape with uniform hypoechogenicity measuring 3.5x4.8cm and 1.5x2.8cm respectively. The right and left breast masses were at 9'0clock and 1'0clock respectively. The second patient had a left breast mass, well circumscribed, round with uniform hypoechogenicity at 9'0clock position measuring 1.2x 2.5cm.

During the postpartum period, clinical breast examination still detected the two solid masses. The first woman still had bilateral solid breast masses that measured 3x4cm on the right and 1x2cm on the left breast. Both masses were firm, freely mobile with no attachment to underlying or overlying structures. The second woman also had a left solid mass that measured 1x2cm. On repeat breast ultrasonography, only the solid masses were seen. In the first woman with bilateral breast masses it measures 3.2x4.3cm and 1.1x2.5cm on the right and left breast respectively. They all had the same location and ultrasound scan features like during the antenatal period.

Fine Needle Aspiration Cytology (FNAC) was used for histological diagnosis of the masses detected and they were all found to be fibroadenoma histologically, with a frequency of 100% as shown in Table 6.

Table 1: Sociodemographic Characteristics.

AGE (YEARS)	FREQUENCY	PERCENTAGES
20-24	5	7.8
25-29	19	29.7
30-34	15	23.4
35-39	21	32.8
>40	4	6.3
Educational status		
Primary	1	1.6
Secondary	11	17.2
Tertiary	52	81.3
Tribe		
Igbo	19	29.7
Yoruba	9	14.1
Hausa	10	15.6
Others	26	40.6
Occupation		
House wife	19	29.7
Business woman	19	29.7
Civil servant	18	28.1
Professional	8	12.5

Parity		
0	10	15.6
1	23	35.9
2-4	30	46.9
>4	1	1.6

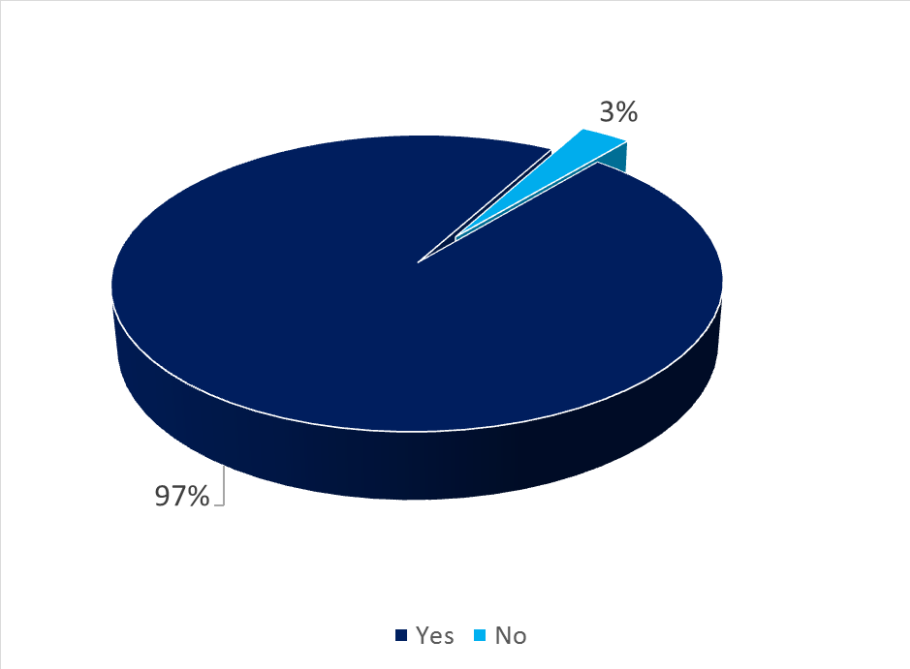

Figure 1: Awareness of breast cancer.

Table 2: Age at first birth.

Age at first childbirth (n=54)	Frequency	Percentage
<20	4	7.4
20-24	13	24.1
25-29	21	38.9
30-34	15	27.8
>35	1	1.9
TOTAL	54	100%

Table 3: Risk factors and presence of breast masses.

Risk Factors	Present	Absent	Test Statistics	P-Value
Family History of Breast, Ovarian or Colorectal Cancer Yes **No**	1(50%) **1(50%)**	0 **62(100%)**	Fishers exact Test	0.031
Total	2(100%)	62(100%)		64(100%)
History of hormonal contraceptives use Yes **No**	1 (50%) **1 (50%)**	14 (22.6%) **48 (77.4%)**		**0.417**
Total	2 (100%)	62 (100%)		64 (100%)
History of Tobacco Use Yes **No**	0 **2 (100%)**	1 (1.6%) **61 (98.4%)**		**0.969**
Total	2 (100%)	62 (100%)		64 (100%)
History of Alcohol Use Yes **No**	0 **2 (100%)**	4 (6.5%) **58 (93.5%)**		**0.878**
Total	2 (100%)	62 (100%)		64 (100%)

Table 4: Detection of breast masses using clinical breast examination and breast ultrasonography.

Method of Breast Exam	SOLID	CYSTIC	NORMAL	TOTAL
Clinical Exam: Antenatal	**2 (3.1%)**	**0**	**62 (96.9%)**	**64 (100%)**
Postpartum	**2 (3.1%)**	**0**	**62 (96.9%)**	**64 (100%)**
Breast USS				
Antenatal	**2 (3.1%)**	**1 (1.6%)**	**61 (95.3%)**	**64 (100%)**
Postpartum	**2 (3.1%)**	**0**	**62 (96.9%)**	**64 (100%)**

Table 5: The Dimension of the Detected Breast Masses.

ANTENATAL	CBE			Ultrasound SCAN		
	<1cm	1-2cm	3-4cm	<1cm	1-2cm	3-4cm
Cystic mass	0	0	0	1	0	0
Solid mass	0	1	1	0	1	1
POSTPARTUM						
Cystic mass	0	0	0	0	0	0
Solid mass	0	1	1	1	1	0

Table 6: Histologic diagnosis of the breast masses detected on clinical breast examination and ultrasound scan.

Tumours	Frequency	Percentage
Fibroadenoma	2	100%
Fibrocystic disease	0	0
Lipoma	0	0
Breast abscess	0	0
Galactocele	0	0
Normal	0	0
Invasive ductal carcinoma	0	0

DISCUSSION

In this study the age range is 20-42 years with mean age of 32.1 ± 5.34 years. This is also similar to 16-46 years reported by Odedina et al[5] at Ibadan with a mean age of 29.7 ± 5.2 years.

Their educational status was tertiary level of education in the majority of cases (81.3%) which is similar to what was found by Ezeonu et al at Abakaliki.[6] This is because the study centre was in central Federal Capital Territory (FCT) where majority of the participants were urban dwellers, civil servants with high literacy rate. This contrast sharply to what was found in Ibadan,[5] where majority had secondary level of education probably because their study area included primary health care centre where majority of the patients were rural dwellers.

Nineteen (29.7%) were of Igbo ethnic group, ten (15.6%) were Hausa, nine (14.1%) Yoruba, and twenty six (40.6%) were of other ethnic groups which included; Ebira, Kanuri, Igala and Edo. This can reflect the cosmopolitan nature of the study centre compared to other studies by Odedina et al[5] and Ezeonu et al[6] where all study participants were of African heritage with majority from Yoruba (92.4%) and Igbo (80.1%) ethic groups respectively. This is because these were the main tribes in those areas.

Similarly, most of the patients are full time housewives and business women. Same was obtained in the study at Abakaliki,[6] and this is similar to other studies in Nigeria. The study also showed majority of the participants were multiparous women. Similar studies in Nigeria,[5,6] also showed comparative results likely because procreation is given so much importance in this part of the world as a childless woman is considered a social outcast.

In Nigeria, majority of breast cancers are known to occur among women of reproductive age group and the cancer tends to be very aggressive.[7,8] A rise in the incidence of breast disease in Nigeria has also been reported[7] and the incidence is likely to increase due to increase in breast cancer awareness. In this study, 97% of the antenatal clinic attendees were aware of breast cancer. This is similar to 83.4% in Abakaliki[6] and 80% reported in Pakistan.[9] The increase awareness among these participants may have been due to high educational status of the majority.

Risk factors for breast cancer were analyzed in this study. It was found that the age range at first birth was between 25-29 years which is not the same when compared to the study by Ezeonu et al[6] that reported age at first birth as <24 years. This is also not in the same range as found in Nepal,[10] where their age range at first birth was between 15-19 years. This could be as a result of high literacy level of the participants reported in that study. The absence of malignant tumours of the breast in this study could be attributed to the small sample size or due to young age of participants (<42 years), younger

age at first birth as well as high parity. It could also be due to reduced number of participants with family history of breast, colorectal and ovarian malignancy, and the low prevalence of hormonal contraception and tobacco use among the participants. These protective factors have been reported by Okobia & Bunker.[11]

A slight left laterality of breast disorders was found in this study. This is similar to the study in Ibadan by Odedina S. O et al.[5]

In this study, Fibroadenoma was the commonest breast mass found at recruitment. This is similar to what is found by Odedina SO et al[5], Ezeonu et al[6], and Spain.[12] According to Bell et al,[13] fibroadenoma was the most common benign solid lesion that grows during pregnancy and breastfeeding due to increase hormones, however, galactocele was found to be the commonest during lactation.

CONCLUSION

With increasing rates of breast cancer and late ages of childbearing, we will likely be faced with more cases of pregnancy associated breast cancer. Therefore, awareness and screening of breast cancer in pregnancy is of paramount importance so as to avoid late detection with its associated morbidity and mortality.

DISCLOSURE

The authors report no conflicts of interest in this work.

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