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Non-Neoplastic Breast Lesions in an Adult Female Population in Niger Delta Region of Nigeria

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Abstract

Introduction: Non-neoplastic breast lesions are common in adult females, causing significant anxiety and concern. These lesions can be radiologic and clinical mimics of breast cancer, therefore making accurate histological diagnosis crucial to exclude malignancy and inform management decisions. The aim of this study was to analyse the spectrum of non-neoplastic breast lesions in female adults, exploring age-related patterns and diagnostic methods.

Methods: A retrospective descriptive study of 378 adult female patients with non-neoplastic breast lesions who underwent histopathological evaluation at the University of Port Harcourt Teaching Hospital between 2013 and 2022.

Results: Fibrocystic change was the most prevalent diagnosis (69.6%), which was more prevalent in women aged 20-50 years. Chronic non-specific mastitis (5.4%) and breast abscesses (3.1%) were also seen. Atypical ductal hyperplasia (1.3%) was also seen and was more prevalent in women aged 40-59 years. Excisional biopsies were the preferred diagnostic method (91.5%).

Conclusion: This study highlights the importance of recognizing non-neoplastic breast lesions, particularly fibrocystic changes, and optimizing diagnostic approaches. Targeted surveillance for atypical ductal hyperplasia and prompt treatment of inflammatory conditions can improve patient outcomes.

Keywords: Non-neoplastic, fibrocystic changes, mastitis, hyperplasia

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Background

The breast is composed of ductal, glandular, fibrous, and adipose tissue.¹ Breast tissue is highly responsive to hormonal fluctuations, particularly estrogen and progesterone, which vary during the menstrual cycle and may contribute to the development of breast disorders.² Non-neoplastic breast lesions are common causes of symptomatic breast diseases in adult females and are caused by physiological alterations in breast tissue, inflammatory diseases and traumatic events affecting most women at some point in their lives.^{3,4} Notably, some of these non-neoplastic lesions can exhibit clinical and radiological features that mimic breast cancer, thereby necessitating thorough evaluation.⁵ These lesions can provoke considerable anxiety and concern in patients, underscoring the importance of accurate diagnosis to exclude malignancy and inform management decisions.⁶ In contrast to malignant breast tumors, non-neoplastic breast conditions are usually not life-threatening; however, certain benign conditions, like atypical hyperplasia, are associated with an increased risk of developing breast cancer in the future.⁶ Non-neoplastic breast lesions comprise a diverse group of conditions, broadly categorized into inflammatory, fibrocystic, and benign proliferative lesions.³ Fibrocystic changes, also referred to as fibrocystic breasts or fibrocystic breast condition,⁷ are among the most prevalent types of non-neoplastic breast lesions, affecting up to 90% of women during their lifetime.⁸ These changes are characterized by fibrosis, cyst formation, and epithelial hyperplasia, leading to symptoms such as lumpiness of the breast, tenderness, and cyst formation.³ Inflammatory breast lesions, including chronic mastitis and breast abscesses, are prevalent among adult females.⁹ These conditions typically present with localized symptoms such as breast pain, swelling, and erythema, and may be accompanied by systemic symptoms like fever. Accurate diagnosis is crucial for guiding antimicrobial

therapy and preventing potential complications. Mammary tuberculosis can mimic malignancies both clinically and radiologically, causing symptoms like palpable breast masses, destruction of surrounding bones and mammographic abnormalities.¹⁰

Method

Study Design

This was retrospective descriptive study.

Study Population

The study was carried out on 378 adult female patients who visited the University of Port Harcourt Teaching Hospital between January 2013 and December 2022 and were histologically diagnosed with non-neoplastic breast lesions following either an excision biopsy or incision biopsy for symptomatic breast lesions. The biopsies were submitted at the Department of Anatomical Pathology, where they were histologically evaluated.

Study Instrument

The clinical and demographic data were extracted from the departmental registers, patient request forms, and duplicate copies of histology reports of all cases. The data extracted include age, sex, type of biopsy performed, histology diagnosis, cell type, and other necessary information retrieved from departmental archives and generated test results.

Data Analysis

Data were analyzed using predictive analytical software (SPSS). Simple frequencies were calculated for categorical variables, and the mean was computed for continuous variables.

Ethical Consideration

Ethical approval was obtained from the Ethical Committee of the University of Port Harcourt Teaching Hospital to carry out this study.

Results

The study analyzed a total of 378 cases, encompassing an age range of 20 to 89 years. The mean age of the participants was 38.78

years (± 11.97 years), with a median age of 37 years and a mode of 34 years (Table 1). The highest concentration of cases occurred within the 20–29 age group, accounting for 28.5% of the total cases (Table 2). This was followed by the 30–39 age group, which accounted for 26.9% of cases, and the 40–49 age group, which accounted for 22.5%. Collectively, these three age groups represent 78.2% of the study population.

Table 1: Age Distribution in the Study Population

AGE	
n	378
Mean	38.78 years
Std. Error of Mean	0.609
Median	37.00 years
Mode	34.00 years
Std. Deviation	11.97
Range	62 years
Minimum	20.00 years
Maximum	82.00 years

Table 2: Number of Samples Received By 10-Year Age Group

Age range (years)	Frequency (n)	Percent (%)
20-29	108	28.5
30-39	102	26.9
40-49	85	22.5
50-59	47	12.4
60-69	23	6.0
70-79	8	2.1
80-89	5	1.3
Total	378	100.0

Over the 10-year period from 2013 to 2022, the distribution of cases remained relatively stable. The highest number of cases was seen in 2018

(47 patients, 12.2%), while 2021 had the fewest (18 patients, 5.2%).

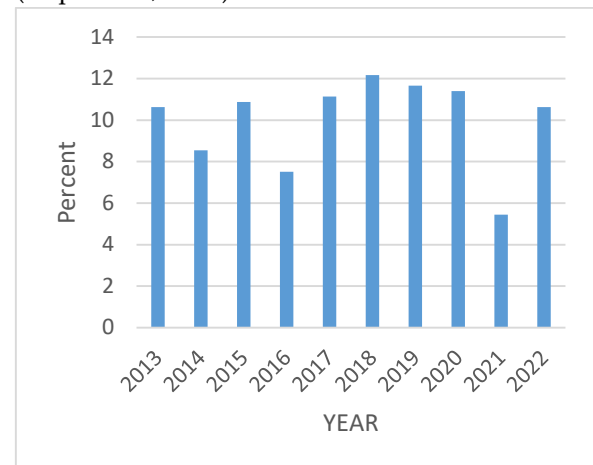


Figure 1: Number of Samples Received Yearly in the 10-Year Review Period

Most specimens were excised breast lumps, constituting 91.5% (346 out of 378 cases). Trucut biopsies represented 8.5% (n=32).

The most prevalent histological diagnosis was fibrocystic change, identified in 69.6% (n=263) of cases (Table 3). Chronic non-specific mastitis was the second most frequent diagnosis, seen in 5.4% (n=21) of cases, followed by breast abscesses, which were identified in 3.1% (n=12) of cases. Other less common histological findings included atypical ductal hyperplasia (1.3%),

Fibrocystic change was consistently the most frequent diagnosis across all age groups, with a particularly high prevalence in the 20–39 age group (70.1%) and the 40–59 age group (63.3%) (Table 6). Chronic non-specific mastitis was more frequently observed in the 20–39 and 40–59 age groups, whereas breast abscesses were distributed relatively evenly across younger and middle-aged individuals. Atypical ductal hyperplasia and chronic granulomatous mastitis were predominantly seen in individuals aged 40–59 years.

Table 3: Diagnosis Based on Age Groups

	20 Year Age Categories				Total n (%)
	20-39 years (%)	40-59 years (%)	60-79 years (%)	>= 80 years (%)	
Abscess	6 (2.7)	6 (4.3)	0 (0.0)	0 (0.0)	12 (3.1)
Atypical Ductal Hyperplasia	2 (0.9)	3 (2.2)	0 (0.0)	0 (0.0)	5 (1.3)
B1	8 (0.9)	3 (2.2)	0 (0.0)	0 (0.0)	16 (4.1)
B2 (Benign)	2 (0.9)	2 (1.4)	0 (0.0)	0 (0.0)	4 (1.0)
B3 (Atypical Ductal Hyperplasia)	0 (0.0)	4 (2.9)	0 (0.0)	0 (0.0)	4 (1.0)
Chronic Dermatitis	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	1 (0.3)
Chronic Granulomatous Mastitis	4 (1.8)	3 (2.2)	1 (4.0)	0 (0.0)	8 (2.1)
Chronic Non-Specific Mastitis	15 (6.8)	5 (3.6)	1 (4.0)	0 (0.0)	21 (5.4)
Duct Ectasia	2 (0.9)	1 (0.7)	0 (0.0)	0 (0.0)	3 (0.8)
Epidermal Inclusion Cyst	3 (1.4)	2 (1.4)	0 (0.0)	0 (0.0)	5 (1.3)
Fat Necrosis	5 (2.3)	1 (0.7)	0 (0.0)	0 (0.0)	6 (1.6)
Fibrocystic Change	155 (70.1)	88 (63.3)	19 (76.0)	1 (100.0)	263 (68.1)
Fibroepithelial Polyp	1 (0.5)	0 (0.0)	1 (4.0)	0 (0.0)	2 (0.5)
Galactocele	2 (0.9)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.5)
Harmatoma	2 (0.9)	1 (0.7)	0 (0.0)	0 (0.0)	3 (0.8)
Inadequate For Pathology Diagnosis	1 (0.5)	2 (1.4)	0 (0.0)	0 (0.0)	3 (0.8)
Intramammary Lymph node With Reactive Lymphoid Hyperplasia	0 (0.0)	1 (0.7)	0 (0.0)	0 (0.0)	1 (0.3)
Keloid	2 (0.9)	3 (2.2)	1 (4.0)	0 (0.0)	6 (1.6)
Non-Specific Dermatitis	0 (0.0)	1 (0.7)	0 (0.0)	0 (0.0)	1 (0.3)
Pseudoangiomatous Stromal Hyperplasia	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)
Usual Ductal Hyperplasia	5 (2.3)	6 (4.3)	0 (0.0)	0 (0.0)	11 (2.8)
Total	216 (100.0)	137 (100.0)	24 (100.0)	1 (100.0)	378 (100.0)

Non-neoplastic breast lesions were more common in the younger and middle-aged populations in this study. A noticeable decline in case frequency was observed among individuals aged 50 years and older, underscoring the predominance of such lesions in premenopausal women, consistent with the findings of Bhakti and Edegbe.^{11,12} The declining frequency of benign breast conditions in older age groups reflects the postmenopausal decrease in hormonal activity, which reduces the susceptibility to certain benign breast lesions. Fibrocystic change is the most common non-neoplastic lesion seen in this study. It was, however, more prevalent in women in the reproductive age group, with the highest number seen in women between 20 and 39 years, which aligns with about 5 notable studies.^{12-15, 3} The age-related trend may be attributed to increased breast changes following cyclical hormonal fluctuations in younger women. Hormonal alterations, with estrogen dominance over progesterone, lead to proliferation of epithelium in terminal duct lobular units, which may induce stromal fibrosis.¹⁶ The epithelial proliferation and stromal fibrosis may, in turn, lead to obstruction of ducts and acini, leading to involution or cyst formation.¹⁷ Certain factors have been linked to the development of fibrocystic diseases, like high socioeconomic class, estrogen replacement hormonal therapy, late onset of menopause, and nulliparity.¹⁸ The high prevalence of fibrocystic changes highlights the importance of prioritizing patient education and reassurance, as these changes are benign and non-life-threatening.¹⁹ Inflammatory breast lesions were the second most common diagnosis in our study, reflecting the inflammatory aspect of benign breast diseases. These include chronic non-specific mastitis, breast abscess and chronic granulomatous inflammation. Studies have shown that inflammatory breast conditions like mastitis and breast abscesses are often linked to factors such as poor breastfeeding techniques,

ruptured breast cysts, poor hygiene, trauma, and bacterial infections.^{9,20} In areas with limited healthcare access, these conditions can worsen and lead to increased morbidity.²¹ Patients with breast abscesses need prompt treatment to prevent complications like fistula formation. Atypical ductal hyperplasia (1.3%) is a significant but rare condition and can potentially develop into cancer. It affects the lining of the breast ducts or lobules.²² Myers, in one of his studies with other authors, suggests that a significant amount of breast biopsies contain ducts with atypical hyperplasia of the lining epithelial cells.²³ This lesion was seen more in women between 40 and 59 years, suggesting that breast lumps in these women should be carefully evaluated, and such women with atypical hyperplasia should not be lost to follow-up. We also found rare conditions like keloids and fat necrosis, which highlight the variety of non-cancerous breast conditions and the need for thorough examination. Excisional biopsies accounted for 91.5% of diagnostic procedures, significantly outnumbering Tru-Cut biopsies at 8.5%. The high rate of excisional biopsies (91.5%) indicates that surgeons using their clinical judgments are more inclined to excise lumps they think are non-neoplastic than to do incisional biopsies, consistent with previous research.³ Excisional biopsies provide definitive tissue diagnoses, which are essential for accurate diagnosis and treatment planning.²⁴ However, the relatively low use of Tru-Cut biopsies (8.5%) in this study raises concerns about potential limitations in technological availability or expertise. Minimally invasive biopsies, such as core needle biopsies, are widely recognized for their effectiveness and reliability in diagnosing breast lesions.²⁵ Despite their limited use, Tru-cut biopsies offer several benefits, including reduced morbidity, faster recovery, and lower costs compared to surgical biopsies.²⁶ The underutilization of Tru-cut biopsies may be due to factors such as limited access to advanced diagnostic

equipment, lack of trained personnel, or institutional preferences for surgical biopsies.²⁷ The stable case numbers over the 10-year period indicate consistent diagnostic activity and healthcare-seeking behavior in the study population. The notable peaks in case numbers in 2017-2020 may be linked to enhanced public awareness initiatives or improved diagnostic capabilities during those years. In contrast, the significant decline in cases in 2021 (5.2%) likely resulted from the COVID-19 pandemic's disruption of global healthcare services. Factors such as fear of infection, mobility restrictions, and the reallocation of healthcare resources to pandemic response likely limited access to diagnostic services during this time.

Conclusion

This study offers a detailed understanding of the spectrum of non-neoplastic breast lesions in female adults, highlighting the relationship between hormonal influences, age-related patterns, and diagnostic methods. Fibrocystic changes were the most common finding, especially in women aged 20-50 years. The study also highlights the importance of recognising and addressing inflammatory and infectious breast conditions such as chronic non-specific mastitis and breast abscesses, which can have a profound impact on a woman's quality of life. Furthermore, the study reveals a preference for excisional biopsies over minimally invasive Tru-cut biopsies, suggesting a need for re-evaluating diagnostic protocols and investing in advanced technologies.

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