



Pattern of Breast Lesions in Ovu Inland, Delta State, South Southern Nigeria

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Abstract

Background: The breast is a site of various pathological changes, encompassing both benign and malignant lesions. Early detection and management of these lesions are essential for improving patient prognosis.

Aim: While studies on breast lesions have been conducted in various parts of Nigeria, data on this subject are scarce in the studied area. Therefore, this study investigated the patterns of breast lesions in Ovu Inland, Delta State, South-South Nigeria.

Materials and Methods: This study was a retrospective histopathological review of 71 breast lesions. Descriptive statistics were used to illustrate the prevalence of breast lesions, while a Chi-square test assessed the association between breast lesions, age, and laterality.

Results: Benign lesions (86.2%) were more common than malignant ones (13.8%) in the studied population. Neoplastic benign fibroadenoma (36.6%) and malignant invasive ductal carcinoma (5.6%) were the most common benign and malignant lesions, respectively. The third decade of life recorded the highest incidence of breast lesions (31%). Right breast lesions (45.1%) were more frequent than left breast lesions (35.2%). No significant association was found between breast lesions, age, and laterality ($p = 0.254$; 0.364).

Conclusion: Neoplastic benign fibroadenoma peaked in the second and third decades, while neoplastic malignant invasive carcinoma was more common in the fourth decade.

Keywords: Breast Lesions; Ovu Inland; Nigeria; Benign; Malignant

Introduction

The human breast is a modified apocrine gland covered by skin and subcutaneous tissue [1]. It rests on the pectoralis major muscle and consists of ducts, lobules, luminal and myoepithelial cells, as well as interlobular and intralobular

stroma. These components are sources of both benign and malignant lesions [2,3]. However, most breast lesions are benign and encompass a heterogeneous array of disorders, including developmental abnormalities, epithelial and stromal proliferations, neoplasms, and inflammatory lesions [4-9]. Several factors contributing to benign breast lesions

have been documented [10,11]. According to Richard and Robert [10], observations in women who used estrogen or anti-estrogen drugs suggest that hormonal factors play a role in the development of benign lesions. This was supported by an earlier study, which noted an increase in these lesions among postmenopausal women who had received estrogen, with or without progestins, for over eight years [11]. Other risk factors include family history, mutations in the BRCA1 or BRCA2 genes [12,13], and loss of heterozygosity caused by DNA deletions [14]. These lesions are often multifocal, with each focal region showing loss of heterozygosity at different DNA sites [10]. The BRCA1 and BRCA2 genes regulate the cell cycle, and mutations in these genes have also been established as risk factors for malignant breast lesions [12]. While benign lesions encompass a variety of histopathological types, only a few have significant premalignant potential [15]. The most important of these are atypical ductal hyperplasia, lobular hyperplasia, and carcinoma in situ [16]. Diagnosis of these lesions presents varying degrees of cancer risk [16]. It is estimated that proliferative breast lesions may become invasive in the same breast within an average period of 11 years [17]. Therefore, distinguishing benign from malignant lesions is crucial for appropriate treatment. The "triple test" used to evaluate breast lesions includes physical examination, radiology, and cytopathology [18]. Although studies on breast lesions have been conducted in various parts of Nigeria [4-6,8,12], there is limited data from the studied area. This study aimed to investigate patterns of breast lesions in Ovu Inland, Delta State, South-South Nigeria.

Methodology

This study was a retrospective histopathological review of 71 breast lesions diagnosed at a pathology laboratory in Ovu Inland, Delta State, Nigeria. Biopsy samples were initially fixed in 10% formal saline and processed using a tissue processor. Embedded sections were stained with Hematoxylin and Eosin (H&E) for histopathological evaluation. One of the authors, a histopathologist, reviewed the slides, and breast lesions were classified into inflammatory, proliferative, neoplastic, and other categories. A Chi-square test was used to determine the association between breast lesions, age, and breast laterality. Ethical approval was obtained from the Faculty of Basic Medical Sciences, Delta State University.

Results

Table 1 showed a total of 71 breast lesions observed, of which 1.4% each were degenerative changes, dysplastic squamous tissue, epithelial cyst, fibroma, galactoceles, and gynecomastia. A total of 1.4%, 4.2%, 1.4%, and 2.8% were observed for inflammatory fat necrosis, granulomatous mastitis, intralobular mastitis, and periductal mastitis,

respectively. Further findings showed that neoplastic benign fibroadenoma and tubular adenoma accounted for 36.6% and 5.6% of the breast lesions.

We also reported 12.7% and 1.4% neoplastic malignant invasive ductal carcinoma and lobular carcinoma lesions, respectively. Pregnancy-like changes and unremarkable tissue each accounted for 1.4% of the breast lesions. Proliferative duct ectasia and fibrocystic change had 14.1% and 1.4%, respectively. Comparing benign and malignant lesions, we observed that 13.8% were malignant while 86.2% were benign.

Table 2 illustrates the frequency of age groups observed from this study. The highest percentages were found within the 3rd, 4th and 5th decades. The least age observed for breast lesions were individuals with unspecified age. Table 3 shows that participants with lesions in the second decade had 1.4% each for inflammatory fat necrosis, proliferative ductal hyperplasia, proliferative duct ectasia, neoplastic benign lesions, galactocoele, and degenerative changes. Neoplastic benign fibroadenoma (12.7%) was also observed in this decade. Findings also indicate that the third decade had the highest number of lesions (31%) in the population studied. Further findings revealed that the fourth and fifth decades recorded 5.6% each for proliferative fibrocystic changes and neoplastic malignant invasive ductal carcinoma as the most predominant lesions. A total of 1.4% each for neoplastic malignant lobular carcinoma, inflammatory periductal mastitis, and fat necrosis was observed in participants within the sixth decade. The sixth and seventh decades recorded 2.8% and 4.2%, respectively, for proliferative fibrocystic changes and neoplastic malignant invasive ductal carcinoma as the common lesions. The Chi-square test showed no significant association between breast lesions and age.

Findings from Table 4 show that 45.1% of breast lesions were observed on the right side, while 35.2% were on the left side. The Chi-square test indicated no significant association between breast lesions and the side on which they occurred.

Table 5 shows unilateral and bilateral breast lesions among the respective age groups in the studied population. Findings indicated that neoplastic benign fibroadenoma and tubular adenoma occurred bilaterally in individuals aged 21-30 years. Proliferative fibrocystic changes were also observed bilaterally in individuals aged 31-40, 41-50, and 51-60 years. Further findings revealed that neoplastic malignant ductal carcinoma occurred bilaterally in individuals aged 41-50 and 61-70 years. Breast lesions that occurred unilaterally include inflammatory chronic mastitis and intralobular mastitis, observed in individuals aged 31-40. Proliferative ductal hyperplasia, duct ectasia, galactocoele, and epithelial cyst occurred unilaterally in individuals aged 11-20 years.

Figure 1 illustrates the occurrence of breast lesions across different decades. A peak was observed in the 2nd and 3rd decades for neoplastic benign fibroadenoma, compared to the 4th decade, where neoplastic malignant invasive

carcinoma was predominant. There was a decline in the occurrence of neoplastic malignant invasive carcinoma in the 6th decade.

Pattern of Breast Lesions	Frequency	Percent
Degenerative Changes	1	1.4
Dysplastic Squamous Tissue	1	1.4
Epithelial Cyst	1	1.4
Fibroma	1	1.4
Galactoceles	3	4.2
Gynaecomastia	2	2.8
Inflammatory Chronic Mastitis	1	1.4
Inflammatory Fat Necrosis	3	4.2
Inflammatory Granulomatous mastitis	1	1.4
Inflammatory Intralobular Mastitis	1	1.4
Inflammatory Periductal Mastitis	2	2.8
Neoplastic Benign Fibroadenoma	26	36.6
Neoplastic Benign Tubular Adenoma	4	5.6
Neoplastic Malignant Invasive Ductal Carcinoma	9	12.7
Neoplastic Malignant Lobular Carcinoma	1	1.4
Pregnancy like Changes	1	1.4
Proliferative Duct Ectasia	1	1.4
Proliferative Ductal Hyperplasia	1	1.4
Proliferative Fibrocystic Change	10	14.1
Unremarkable tissue	1	1.4
Total	71	100

Table 1: Distribution of breast lesion patterns in the studied population.

Age Groups	Frequency	Percent
11-20years	15	21.1
21-30years	22	31
31-40years	17	23.9
41-50years	8	11.3
51-60years	5	7
61-70years	3	4.2
Unspecified age	1	1.4
Total	71	100

Table 2: Age distribution in the studied population.

Pattern of Breast Lesions	Age group							Chi-square
	11_20	21-30	31-40	41-50	51-60	61-70	Unspecified Age	
Inflammatory Chronic Mastitis			1 (1.4)					
Inflammatory Periductal Mastitis		1(1.4)			1(1.4)			
Inflammatory Fat Necrosis	1(1.4)	1(1.4)			1(1.4)			
Inflammatory Granulomatous mastitis			1(1.4)					
Inflammatory Intralobular Mastitis			1(1.4)					
Proliferative Fibrocystic Change		1(1.4)	4 (5.6)	3(4.2)	2 (2.8)			0.254
Proliferative Ductal Hyperplasia	1(1.4)							
Proliferative Duct Ectasia	1(1.4)							
Neoplastic Benign Fibroadenoma	9 (12.7)	13 (18.3)	2 (2.8)	1(1.4)			1(1.4)	
Neoplastic Benign Tubular Adenoma	1(1.4)	3 (4.2)						
Neoplastic Malignant Invasive Ductal Carcinoma			2 (2.8)	4 (5.6)		3 (4.2)		
Neoplastic Malignant Lobular Carcinoma;					1(1.4)			
Galactocele	1(1.4)	1(1.4)	1(1.4)					
Pregnancy like Changes			1(1.4)					
Degenerative Changes	1(1.4)							
Epithelial Cyst		1(1.4)						
Fibroma'			1(1.4)					
Unremarkable tissue			1(1.4)					
Dysplastic Squamous Tissue			1(1.4)					
Gynaecomastia		1(1.4)	1(1.4)					
Total	15 (21.1)	22(31.0)	17 (23.9)	8 (11.3)	5 (7.0)	3 (4.2)	1 (1.4)	

Table 3: Chi-square test of association between Pattern of breast lesions and Age group in the studied population.

Pattern of Breast Lesions	Right	Left	Unspecified Side	Chi-square
Inflammatory Chronic Mastitis		1 (1.4)		
Inflammatory Periductal Mastitis	2 (2.8)			
Inflammatory Fat Necrosis	2 (2.8)	1 (1.4)		
Inflammatory Granulomatous mastitis	1 (1.4)			
Inflammatory Intralobular Mastitis		1 (1.4)		
Proliferative Fibrocystic Change	5 (7.0)	5 (7.0)		0.364
Proliferative Ductal Hyperplasia	1 (1.4)			
Proliferative Duct Ectasia	1 (1.4)			
Neoplastic Benign Fibroadenoma	10 (14.1)	11 (15.5)	5 (7.0)	
Neoplastic Benign Tubular Adenoma	2 (2.8)	1 (1.4)	1 (1.4)	
Neoplastic Malignant Invasive Ductal Carcinoma	2 (2.8)	3 (4.2)	4 (5.6)	

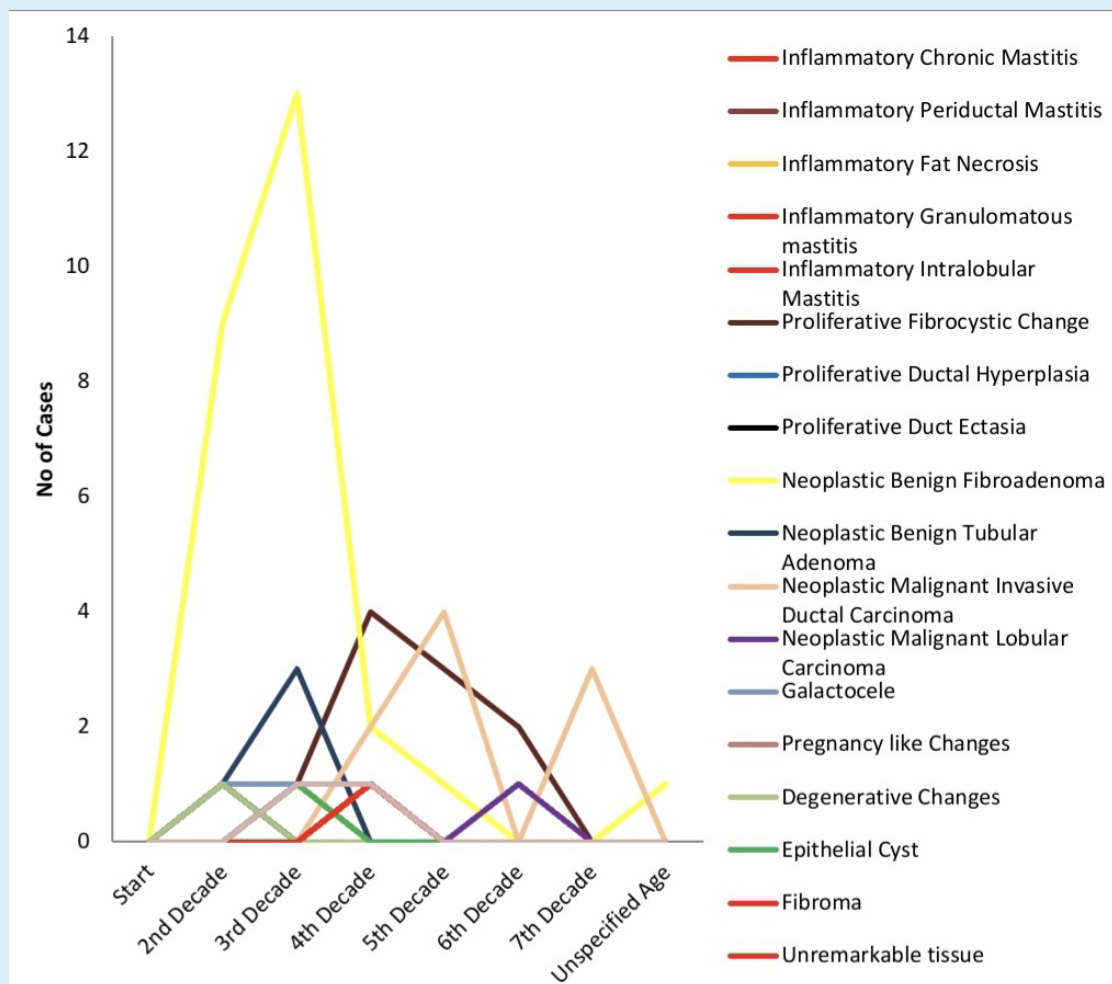
Neoplastic Malignant Lobular Carcinoma	1 (1.4)			
Galactoceles	2 (2.8)		1 (1.4)	
Pregnancy like Changes			1 (1.4)	
Degenerative Changes			1 (1.4)	
Epithelial Cyst	1 (1.4)			
Fibroma	1 (1.4)			
Unremarkable tissue	1 (1.4)			
Dysplastic Squamous Tissue			1 (1.4)	
Gynaecomastia		2 (2.8)		
Total	32 (45.1)	25 (35.2)	14 (19.7)	

Table 4: Chi-square test of association between Pattern of breast lesions and laterality in the studied population.

Type of lesion	Side/Age of Lesion																								Total
	Right								Left								Unspecified Side								
	11-20	21-30	31-40	41-50	51-60	61-70	U	Total	11-20	21-30	31-40	41-50	51-60	61-70	U	Total	11-20	21-30	31-40	41-50	51-60	61-70			
Inflammatory																									
Chronic Mastitis											1					1									1
Periductal Mastitis		1			1			2																	2
Fat Necrosis	1				1			2		1						1									3
Granulo-matous mastitis			1					1																	1
Intralobular Mastitis											1					1									1
Proliferative																									
Fibrocystic Change			3	1	1			5		1	1	2	1			5									10
Ductal Hyperplasia	1							1																	1
Duct Ectasia	1							1																	1
Neoplastic																									
Benign																									
Fibroa-denoma	4	4	1				1	10	3	8						11	2	1	1	1					26
Tubular Adenoma		2						2		1						1	1								4
Malignant																									
IDC				1		1		2			1								1	2			1		9
Lobular Ca					1			1			1		1			3									1
Others																									
Galactocele	1	1						2											1						3

Pregnancy like Changes																		1					1
Degenerative Changes																	1						1
Epithelial Cyst		1						1															1
Fibroma			1					1															
Un-remarkable tissue			1					1															1
Dysplastic Squamous Tissue																							1
Gynae-comastia									1	1					2								1
Total	8	9	7	2	3	1	1	32	3	12	6	3	1	1		26	4	1	5	3		1	71

Table 5: Laterality and age of lesions in the studied population.



Discussion

Findings from this study showed that benign breast lesions occurred more frequently than malignant tumors. This is consistent with studies conducted in Zaria, Enugu, Kano, Benin, and Ibadan, Nigeria [4-8]. Similar studies from other parts of Africa and the world, such as Kenya, Ethiopia, Jamaica, and India, also align with our findings [18-21]. Among benign lesions, neoplastic benign fibroadenoma was the most prevalent in the studied population, consistent with previous studies [4,5,8,18-26]. The etiology, epidemiology, and pathophysiology of fibroadenoma could explain its predominance across various populations. Fibroadenomas are described as painless, non-cancerous tumors [27], typically occurring in women of reproductive age and are prone to atrophy after menopause. Therefore, they are less commonly observed in post-menopausal women [27]. These tumors arise from stromal, epithelial, and connective tissues, which are functionally important in the breast. They contain receptors for estrogen and progesterone, leading to increased proliferation during pregnancy due to the excessive secretion of female reproductive hormones, which further stimulates connective tissue proliferation in the breast [27]. In this study, fibroadenoma was followed by proliferative fibrocystic changes in the studied population. This finding is consistent with Ezike, et al. [25] and Akinapally, et al. [21], who found that fibrocystic changes were the second most common benign breast disease (BBD) observed in Abuja, Nigeria, and Telangana, India, accounting for 29.3% and 21.8% of their studied populations, respectively. However, this differs from the study by Begum, et al. [28], which found that lactating adenoma was the second most common BBD. These differences may result from variations in the genetic makeup of different populations. Neoplastic malignant invasive ductal carcinoma was the most prevalent malignant breast lesion, a finding that aligns with previous studies [4,8,12,21,26]. Invasive ductal carcinoma is the major type of breast cancer, characterized by the infiltration and malignant proliferation of neoplastic cells within breast tissue [29].

The third decade of life recorded the highest number of lesions in the studied population, a finding that differs from Mayun, et al. study in Gombe, Nigeria [12], where the fourth decade showed predominance. We also found that neoplastic benign fibroadenoma was most common in the second and third decades, which is consistent with Yerakly and Tadele's study in Ethiopia [19]. It has been documented that fibroadenoma typically occurs in women between 14 and 35 years of age [27]. The fourth decade had proliferative fibrocystic changes as the most frequent breast lesion, differing from Yerakly and Tadele [19], who found more cases of this lesion in the third decade. Our study showed no association between breast lesions and age. Neoplastic malignant ductal carcinoma was most prevalent in the fifth

and seventh decades, consistent with Bhatnagar, et al. [30], who found ductal carcinoma in women aged 41-50, and Bukhari [31], who noted that this cancer is typically detected in women in their fourth to sixth decades of life. However, this differs from Josephine, et al. [18], who observed this lesion in women aged 20-34. Breast lesions occurred more frequently on the right side than on the left in our studied population, a finding that differs from Yerakly and Tadele's [19] study of Ethiopian women, where lesions were more common on the left side. We also found no association between breast lesions and laterality in the studied population.

We investigated both bilateral and unilateral breast lesions, observing that neoplastic benign fibroadenoma and tubular adenoma occurred bilaterally in the second decade, while proliferative fibrocystic changes were seen in the fourth to sixth decades. Malignant invasive ductal carcinoma also occurred bilaterally in the fourth and sixth decade. Other breast lesions occurred unilaterally across different age groups. Additionally, no association was found between age and breast lesions in the studied population.

Conclusion

Benign breast lesions were more prevalent than malignant ones in the studied population. A peak in the second and third decades was observed for neoplastic benign fibroadenoma, while neoplastic malignant invasive carcinoma was more common in the fourth decade. There was no association between breast lesions, age, and laterality.

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