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Clinical Presentation and Histopathological Pattern of Breast Lesions: A Five Years' Single Center Experience

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Abstract

Background

Breast lesions are very common and vary across the age in both females and males. Breast lesions constitute the commonest indication for breast surgery in women. The clinical presentation mirrors the underlying condition. Understanding local profile of breast lesions is an essential component in patients' management decision making and resource allocation. This study was conducted to determine local clinical and cytohistopathological pattern of breast lesions seen in Dodoma for a period of five years from 2011 to 2015.

Methods

Retrospective descriptive chart review of breast specimens and cytology submitted for cytohistopathological examination for a period of five years. Data extraction sheet was used to collect clinical and cytohistopathological information from the available laboratory master sheet. Information such as demographic factors, clinical presentation, cytological, and histopathological results were obtained. Data analysis was done using IBM SPSS version 23. A p-value of less than 0.005 at confidence interval of 95% was considered significant.

Results

Out of 8758 specimens submitted, 534 (6.1%) were breast lesions; patients' median age was 29 years, with mean age for benign and malignant lesions being 27 and 50 years respectively, female to male ratio was 25:1. The common symptoms were; painless lumps, breast ulceration/skin changes and breast pain in 66.8%, 15.8% and 5.4%, respectively. Fibroadenoma (54.6%), mastitis/ductal ectasia (15.8%), fibrous mastopathy (7.7%) and fibrocystic changes (5.4%) were the commonest benign lesions. Infiltrative ductal carcinoma not specified was the leading malignant histopathology (71.8%), most were poorly differentiated (74.4%) affecting young and middle aged patients (26-50 years). Lobular carcinoma (38.3%) was the leading malignancy in other histological types, followed by comedocarcinoma (10.5%) and aprocrine carcinoma (8.4%).

Conclusion

Benign breast lesions were the most common in this facility, most of which were fibroadenoma. Malignant tumors presented late and were predominantly poor differentiated infiltrative type, preferentially affecting young adults. An effort to enhance early detection for timely management is encouraged, given the aggressive nature of the disease.

Key Words: *Breast Lesions, Clinical Presentation, Pattern, Cytology and Histopathology.*

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Introduction

Breast diseases and conditions are very common among women of all ages, varying from simple and benign to life threatening malignant lesions (1, 2). Breast lesions can be seen early in life as a result of congenital anomalies (3), but more commonly are seen later in life. Benign non proliferative conditions are generally more frequently found in younger, while malignant tumors are increasingly more common as the age advances (4).

Globally, breast cancer is one of the leading causes of cancer related deaths, with an estimated 626,679 deaths in the year 2018, contributing 11.6% of total number of cancer related deaths (5). In the same report, in East Africa, the incidence of breast cancer was estimated to be around 29.9 per 100,000 women, lower than estimated the incidence in Europe (5). In Tanzania, a recent epidemiological study puts breast cancer as the sixth commonest causes of cancer related death (6).

The clinical presentation varies with the underlying pathology, but the most common reported presenting features being; painless lumps, breast pain or painful lumps and nipple discharge (4). Skin changes such as dimpling, ulceration and nodulation are typical of malignant tumors. Infection will usually present dramatically with breast pain, swelling and fever. Breast lesions constitute the commonest causes of surgical intervention in women (7). The diagnosis is by clinical, radiological, and cytohistological evaluation also called triple assessment.

Histopathologically, breast lesions reflect the anatomy and histology of the mammary gland; lesions can originate from epithelial cells of the ducts and glands or from the stromal tissues. The former leads to papilloma, adenoma, and ductal and lobular carcinoma and the latter is the source of phyloides tumors and other non-epithelial soft tissue tumors. Inflammatory conditions can occur at any age, but are more common in lactating mothers (8), unless the cause is systemic in origin as it can be seen in case of mammary tuberculosis.

The pattern of breast lesions in our setting has not been characterized despite breast surgery being very common. Understanding local profile of breast lesions is an essential package in managing patients with breast lesions, with focus on resource planning and prioritization. Moreover, proper diagnosis allows appropriate counseling for benign non-life threatening conditions, while allowing timely and early surgical intervention when there is malignant lesion, the later resulting in reduction of both morbidity and mortality associated

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with breast cancer (4). The objective of this study was to determine clinical and cytohistopathological pattern of breast lesions submitted at a single pathology center located in Dodoma for a period of five years from 2011 to 2015.

Methodology

Study design

This study was retrospective, descriptive chart review of histological or cytological specimens originating from breast lesions, which were submitted to a pathology laboratory located in Dodoma Municipality, in Central Tanzania.

Study area

This study was conducted in the only existing private histopathological laboratory located in Dodoma City, Central Tanzania. The laboratory received specimens from hospitals in Dodoma and neighboring regions such as Singida, Manyara, and Iringa with a combined population of almost four million.

Data collection and variables

Essential information was obtained from the already existing data base stored in form of Microsoft Access. Relevant information on patients' demographic factors, symptoms, signs, types of tissues submitted, gross description (whenever applicable), cystological results, and histopathological details were extracted and filled in data extraction sheet. Specimens missing necessary information were not included in this study. We also excluded specimens which were reported as poorly fixed and therefore could not be examined. Histological variables considered were grouped into;

Non-cancerous lesions; this included fibroadenoma/adenoma, tuberculous mastitis, bacterial mastitis and ductal ectasis as mastitis, fibrocystic changes included other forms of cysts. Other variables were dermatitis, normal or hyperplasia, fibrous mastopathy, phyloides tumor, inadequate tissue and others less frequent reports such as periductal fibrosis, fat necrosis, epidermal cyst, leiomyoma and dermatofibroma

Cancerous lesions; this included ductal carcinoma not otherwise specified and special histological types such as lobular carcinoma, mucinous, comedocarcinoma, and mixed

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lesions. There were other forms such as pleomorphic, tubular, lymphoma, secretory, granular and papillary in a smaller number of patients.

Data was checked for completeness and cleaning and coding was done and then transferred into IBM SPSS version 23 software for analysis. Continuous variables such as age were summarized into means, median, range and standard deviation, while categorical variables were summarized using pie chart and frequency tables. Where necessary cross tabulation was done to determine significant relationship. A p-value of 0.005 at confidence interval of 95% was considered significant.

Results

Out of 8758 specimens submitted for cytohistopathological examination, there were 534 breast lesions equivalent to 6.1%. The proportion of malignant lesions was 29.2% (N=156). Only 21 (3.9%) lesions were coming from male patients, the Female: Male ratio of 25:1, the median age was 29 years. Mean age of patients with benign lesions was 27 years, and for malignant lesions it was 50 years (p=.000). Majority of patients were in the age group of 11-25 years, followed by 26-50 years.
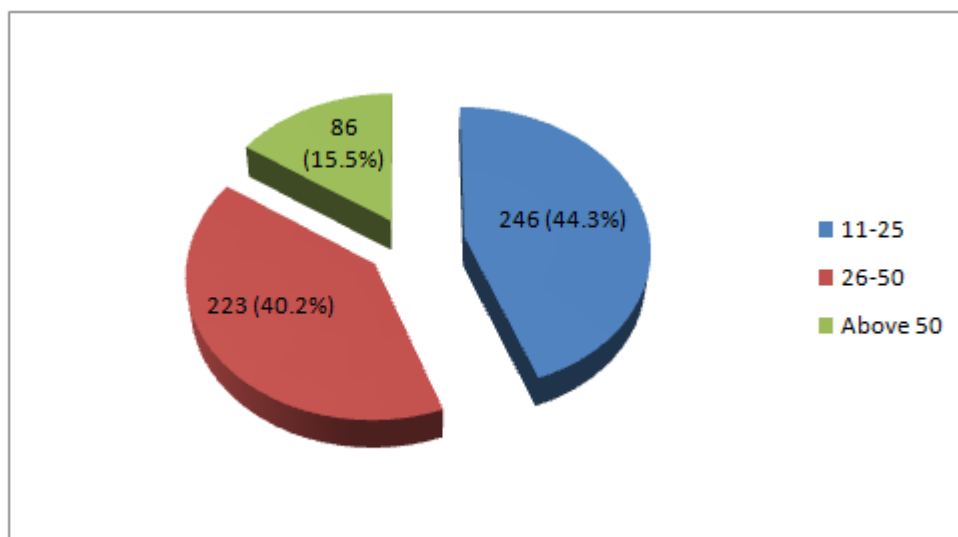

Figure 1: Age group distribution

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Clinical presentation and histological types of breast lesions

Majority of patients presented with painless breast lumps (66.8%), breast skin ulceration or skin changes were seen in 15.7% and only 2.9% presented with nipple discharge. Almost three quarters of patients had excisional biopsies (74.1%), and about 12% had mastectomy. The commonest benign breast lesion was fibroadenoma (54.6%), followed by mastitis with or without ductal ectasia (15.7%). Fibrous mastopathy was seen in 7.7% of cases and fibrocystic changes in 5.4%. One case had tuberculous mastitis.

The overall proportion of breast cancer was 29.5%, in females it was 29.2% (156/534) and among males it was 38.1% (8/21). Ductal carcinoma not otherwise specified was the most frequent (71.8%), of which nearly three quarters (74.4%) were poorly differentiated infiltrative or grade III. The other malignancy types constituted about 28.2% of lesions, large proportion of them were lobular carcinoma (41.6%), most of which were well to moderately differentiated or grade II (38.3%). Mucinous, apocrine and comedo types contributed 8.5%, 10.6% and 8.5% respectively. (**Table 1**).

Age and sex distribution of cancerous vs non-cancerous lesions

Table 2 shows the distribution of malignant diagnoses among the 164 patients categorized by age and sex. Breasts from patients who were 25 years of age or younger were significantly less likely to harbor malignancy (p value = 0.00001) as compared to other age groups under review. Proportion of male patients with histological diagnosis of breast cancer was 9% higher than among female, but the difference was not statistical significant` (p value = 0.38). The mean age among patients with benign lesions was 20 and in malignant it was 50 years, the distribution being significant (p=.000).

Age distribution of infiltrative ductal carcinoma not otherwise specified (NOS)

None of the breast lesions from patients aged below 25 years was malignant Three quarters of all ductal carcinoma NOS in both age groups were poorly differentiated infiltrative (73.1% for 26-50 age group and 76% for those above 5oyears). The difference was statistically significant but numbers less than five are noted. Gender distribution was not significant, but all six cases in males were infiltrative ductal carcinoma, which was poorly differentiated or grade III.

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Table 1: Clinical presentation and histological types of breast lesions

Parameter	Frequency	%
Clinical presentation (N = 555)		
Painless breast lump	371	66.8
Painful breast lump	81	14.6
Breast ulceration/skin changes	87	15.7
Nipple discharge	16	2.9
Type of biopsy examined		
Fine needle aspiration	7	1.3
Core needle biopsy	21	3.8
Excisional biopsy	411	74.1
Incisional biopsy	50	9
Mastectomy	66	11.9
Histology of benign lesions (N = 392)		
Fibroadenoma/adenoma	214	54.6
TB mastitis	1	0.3
Mastitis/ductal ectasia	62	15.8
Fibrocystic changes/cysts	21	5.4
Dermatitis	17	4.3
Normal or hyperplasia	10	2.6
Fibrous mastopathy	30	7.7
Phyloides tumor	5	1.3
Inadequate tissue	6	1.5
Others**	26	6.6
Ductal carcinoma types (N = 117)		
Ductal carcinoma infiltrative well to moderately differentiated	28	23.9
Ductal carcinoma infiltrative poorly differentiated	87	74.4
Mixed	2	0.01
Other histological carcinoma (N = 47)		
Lobular carcinoma well to moderate differentiated	18	38.3
Lobular poorly differentiated	2	4.3
Mucinous	4	8.5
Comedo	5	10.6
Apocrine	4	8.5
Mixed form	2	4.3
Others***	12	25.5

**Include: Periductal fibrosis, fat necrosis, epidermal cyst, leiomyoma and dermatofibroma
*** Include: Medullary, secretory, papillary, pleomorphic carcinoma and Paget's disease

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Table 2: Age and sex distribution of cancerous vs non-cancerous lesions

Variable	Frequency of Cancerous lesions	Frequency of Non-cancerous (%)	P - value
Age			
<25	3 (3.5)	83 (96.5)	0.00001
25 - 50	94 (38.2)	152 (61.8)	
>50	67 (30)	156 (70)	
Sex			
Male	8 (38.1)	13 (61.9)	0.381566
Female	156 (29.2)	378 (70.8)	

Table 3: Histological pattern of infiltrative ductal malignant tumors according to age and sex

Age in Groups	Histological pattern of NOS malignant tumors			Total	
	Ductal carcinoma infiltrative well to moderately differentiated	Ductal carcinoma infiltrative poorly differentiated	Mixed		
11-25	0	0	0	0	p=.000
26-50	16 (23.9)	49 (73.1)	2(3)	67 (57.3)	
Above 50	12 (24)	38 (76)	0	50 (42.7)	
Total	**28 (25.6)**	**87 (74.4)**	**2 (1.7)**	**117**	
Sex					
Female	28 (25.2)	81(73)	2(1.8)	111 (94.9)	p=.3
Male	0	6(100)	0	6 (5.1)	
Total	**28 (25.6)**	**87 (74.4)**	**2 (1.7)**	**117**	

Note: Numbers in brackets are in percentage

Age and sex distribution for other malignant breast lesions

For other malignant tumors; 3 cases were aged below 25 years, majority were in the 26-50 years' age group, lobular carcinoma was the most common histological tumor in all age groups. Only two male cases had specified breast cancer.

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Table 4: Age and sex distribution for other malignant breast lesions

Age groups	Distribution of other breast malignant tumors by age and sex							Total
	Lobular carcinoma well to moderate differentiated	Lobular poorly differentiated	Mucinous	Comedo	Apocrine	Mixed form	Others	
11-25	1	1	0	0	0	0	1	3
26-50	12	0	3	2	2	2	6	27
Above 50	5	1	1	3	2	0	5	17
Total	**18**	**2**	**4**	**5**	**4**	**2**	**12**	**47**
Sex distribution								
Female	18	2	3	5	3	2	12	42
Male	0	0	1	0	1	0	0	2
Total	**18**	**2**	**4**	**5**	**4**	**2**	**12**	**47**

**Pleomorphic carcinoma, tubular carcinoma, lymphoma, secretory carcinoma, recurrent, granular cell tumor and papillary carcinoma

Discussion

The sex distribution of patients in this study is similar to other studies (7, 9, 10), however, the median age of 29 years is lower than most of reports (7, 9, 10). The predominance of younger patients in this study is different from that of Raza (4), although the age range was almost similar. It is known that benign lesions of the breast particularly fibroadenoma are predominantly common in young age (11), and in this study the mean age for benign lesions of 27 years possibly reflects higher rate of fibroadenoma excision which is often done in young age. It is therefore empirical that a study which mainly evaluated malignant breast lesions like that of Forae and colleagues (10) would have older mean age than ours. The higher proportion of the age group 26 to 50 years is not different from other studies (9).

The clinical presentation of breast lumps in this study is also similar to other studies (4, 12); presence of skin ulceration or other changes parallels the prevalence of breast cancer (4, 10). It is known that painless mass is typical for both benign and early breast cancer lesions (12). Generally, there are fewer conditions or diseases of breast which may lead to painful breast lesions, usually caused by inflammatory conditions such as breast abscesses or mastitis and fibrocystic changes, both of which have occurred in smaller proportion in this study.

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The higher frequency of fibroadenoma (54.6%) in this study has been reported elsewhere (7, 11, 13); this is not surprising because fibroadenoma is a condition of youth, however, the proportion of cases with mastitis/ectasia (18%) was higher than that reported by Olu-Eddo and Ugiagbe (9) and Rioki and Regena (2019) (14), who reported prevalence of 8% and 9.7%, respectively. However, it is similar to a report from Saudi Arabia by Raza and colleagues (4). Higher prevalence in this study possibly reflects differences in classification of inflammatory lesions, in our case for example, we included all types of inflammatory lesions, including abscesses, interstitial mastitis and ductal ectasia in the same category.

The proportion of fibrous mastopathy of 7.7% is significantly higher than the known prevalence of less than 1% (15); fibrous mastopathy has been linked to Type 1 diabetes mellitus although it can occur in healthy individuals (16). Higher proportion may indicate higher prevalence of patients with diabetes mellitus which was beyond the scope of this study, but may also reflect selection bias and hence requiring an additional and separate investigation. The prevalence of fibrocystic changes of 5.4% is lower than what has been reported from other studies (9), possibly mirroring the true prevalence in our society or as discussed above it may be caused by selection bias; as in proper settings fewer of them would require biopsy.

The breast cancer proportion of 29.5% among the cytological and histopathological specimens in this study is similar to other reports (10, 14), but higher than a study from India, Bangladesh and Saudi Arabia (4, 7, 11). It should well be stressed, however, that is not the true prevalence of breast cancer in the population, but rather reflects hospital prevalence which is subject to referral bias. Furthermore, the proportion of breast cancer among women of 29.2% is almost similar to the overall proportion (29.5%), but the same is higher in men (38.1%), which remind readers that breast lumps in men should be considered malignant until proven otherwise (17).

Just like in most studies (4, 13-14, 17-18), ductal carcinoma NOS was the most frequent cytohistopathological type (71.8%), of which about three quarters were poorly differentiated infiltrative type or grade III (74.4%), this was followed by lobular carcinoma, majority of the later were moderately differentiated or grade II, indicating tendency to better prognosis. Moreover, it is known that patients with breast cancer in developing countries present late to the hospital, which is often compounded by lack of resources to appropriately diagnose and treat breast cancer (19).

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As discussed above, the age and sex distribution of malignant lesions in this study compares with findings reported in other studies (7, 9). Malignant lesions were more common with increasing age, while benign conditions were common in younger age group (p = <.000). We have noted that, sex distribution is not significantly differently in our study, but in men all cases of ductal carcinoma were poorly differentiated or grade III and were infiltrative; this is in agreement with the fact that breast cancer in men carries a poor prognosis (17).

Conclusion

Benign breast lesions were the most common in this facility, most of which were fibroadenoma. Malignant tumors presented late and were predominantly poorly differentiated infiltrative type preferentially affecting young adults. An effort to enhance early detection for timely management is encouraged, given the aggressive nature of the disease.

Ethical consideration

The permission to undertake this study was obtained from the University of Dodoma ethical committee through the College of Health Sciences ethical subcommittee. Key ethical issues were; use of patients' information, privacy and confidentiality. Because of nature of this study, it was not possible to inform patients so as to obtain their consent. To ensure privacy and confidentiality, codes instead of actual names were used during data handling and entry into the data extraction sheet. Both the computer and data was kept secured and only the principal researcher could access the data and patients' information.

Conflict of interest

Authors declare no conflict of interest.

Authors' contribution

MYM Organized the research, supervised data collection, wrote the report and prepared the manuscript. AMK Collected the data, participated in report writing and manuscript review. MM Cytological and histopathological analysis and data collection.

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