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ORIGINAL ARTICLE

PATTERNS OF BREAST FINE NEEEDLE ASPIRATION CYTOOGY RESULT AMONG PATIENTS WITH BREAST COMPLAINTS ATTENDING JIMMA UNIVERSITY SPECIALIZED HOSPITAL, SOUTHWESTERN ETHIOPIA.

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ABSTRACT

Aims/purpose: *Breast cancer is the most common cancer in women worldwide and the incidence of breast cancer has been increasing. In Africa, it is currently the most common cancer in women.*

Objective: *This study has sought to investigate the incidence of breast cancer in Jimma University specialized hospital , which is the sole provider for pathology services in southwestern Ethiopia serving around 20 million people*

Methods: *Results of patients who underwent a diagnostic procedure of fine needle aspiration cytology over a period of five years from September 2013 to July 2018 specifically for a breast complaint were reviewed.. Data was collected using a structured questionnaire, compiled and analyzed using SPSS version 22.*

Results: *A total of 698 patients underwent Fine needle aspiration cytology fine needle aspiration cytology for breast complaints during the study period. Fifteen cases were excluded due to incompleteness of data. From the remaining 683 cases, 598 (89%) and 75 (11%) were females and males respectively. The age of the participants ranged from 8 to 80 years with a mean age of 32 years (standard deviation ± 13 years). Diagnostic outcome was classified into five categories: benign without atypia in 447(65.5%) cases, benign with atypia in 6 (0.9%) cases, inflammatory lesions in 142(20.8%) cases, suspicious for malignancy in 3(0.4 %) of the cases and malignant in 73 (10.7%) cases. The records of the remaining 11(1.6%) cases were deemed to be non-conclusive.*

Conclusion: *We have noted that there was an increasing trend of breast cancer in the study area over subsequent years. The highest prevalence of breast cancer was noted in women who were in their sixth and seventh decade of life. We have also noted that patients with breast cancer wait a significant amount of time before seeking health care and more than half of the cases come with features of locally advanced cancer.*

INTRODUCTION

Breast cancer is the malignant proliferation of epithelial cells lining the ducts or lobules (1) Numerous risk factors have been documented as causes of breast cancer. These include exposure to exogenous hormones as with oral contraceptives, hormone replacement therapy (2) and dietary fat intake (3) result in an increase in the risk of breast cancer. Despite recognition of all these risk factors, about 70% of females who develop breast cancer do not have identifiable risk factors. (4)

Breast cancer is the most common cancer in women worldwide, with nearly 2.1 million new cases diagnosed in 2018 (second most common cancer overall). This represents about 12% of all new cancer cases and 24% of all cancers in women. (5) When compared to the WHO report in 2008 and 2012 breast cancer seems to be on the rise and it is estimated that by 2025 over 19.3 million women, with the majority from sub Saharan African nations will be affected by breast cancer.(6)

Breast cancer still remains among the most lethal cancers in women and accounted for 626,679 deaths in 2018, the majority of deaths having occurred in sub Saharan Africa. The five-year survival rates of women with breast cancer in this region is below 40% compared to women living in the United States who have survival rates approaching 90% (7) Breast cancer is also a growing health problem in sub-Saharan Africa (8,9).

However, breast cancer prevention and control in Africa is relatively limited, owing in part to a lack of reliable epidemiologic risk factor data and information from which evidence-based interventions could be developed (10,-13).

Cytology, the most commonly used diagnostic modality in the diagnosis of breast pathologies, can explore breast lesions in three distinct ways, that is, by fine needle aspiration cytology (FNAC), scraping of skin (SS), and smearing of nipple discharge (ND) (Where is the reference).

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Among the above, FNAC of breast lumps is an important part of a triple assessment of palpable breast lumps (the other two are clinical examination and mammography). FNAC is an accurate, rapid, easy to perform, cost-effective and reproducible diagnostic tool. FNAC has a sensitivity ranging from 84% to 97.5% and specificity of 99% to 100% for breast lesions (14). To design and implement appropriate interventions and care, knowledge on the local prevalence, type and distribution of breast malignancies has a great importance.

At Jimma University Medical Center (JUMC), studies on breast cancer prevalence are limited. This study is important from the point of view of providing a (incidence) estimate for breast cancer, one of the commonest and deadliest cancers afflicting women worldwide.

METHODS AND MATERIALS

Study area, study design, study period*:* The study was conducted in the Department of Pathology of JUMC, Jimma, Ethiopia. JUMC is the only referral hospital in the southwestern part of the country providing service for more than 15 million people with a catchment area of 17,000 square kms. The Department of Pathology of JUMC is within the Faculty of Medicine of the University and is the only department providing pathology services in the southwestern part of the country. A cross sectional retrospective study design was employed by analyzing data from patient records. Data was collected for the nearly five-year period spanning from September 2013 to June 2018. The records of all patients who underwent FNAC for a breast complaint at JUMC pathology department during the study period constituted the study population.

Sample size determination and sampling procedure*:* Convenience non-probability sampling, utilizing inclusion and exclusion criteria were used and FNAC reports of all patients in the study population within the study period were taken. Any incomplete FNAC reports where two or more variables were missing and those reports where the final FNAC diagnosis was not reported were excluded from the study.

Data collection and analysis: Data was collected using a structured data collecting format. The principal investigator and a trained data collector of the pathology department collected all the data. Data was cleared, edited and analyzed using IBM SPSS v22 software. The presence of an association between the variables was investigated using the Chi-square test. Those with a p-value < 0.05 were considered to be statistically significant**.**

Data collection commenced with the permission and cooperation of the pathology department.

RESULTS

There were a total of 698 cases that underwent FNAC at JUMC pathology department for a breast complaint from September 2013 to June 2018. Out of these, 15 cases were excluded from the study because of the incompleteness of the data. From the remaining 683 cases, there were 598 (88.85%) males and 75 (11.14%) females making the female to male ratio 8:1 (10 reports did not specify sex of patients). The age of the participants ranged from 8 - 80 years with a mean age of 32 ± 13 years. The majority of the participants were between the age group of 20-30 with 271 (40.1%) cases followed by the age group 30-39 with 153 (22.7%) cases (the age and sex of 18 individuals were missing from the record) (Table 1).

211(35%) cases were from the study area (Jimma) while 392(65%) cases came from somewhere else. (And in 80 cases, the address of the patients were not found) There were 19 (9.05%) breast cancer cases from Jimma and 43(10.97%) breast cancer cases were reported from people living outside of Jimma. The sex-specific prevalence of breast cancer among patients with breast complaints was 11.39% in females (68 cases) and 5.33% (4 cases) in males.

The following diagnostic categories were used: Benign without atypia in 448(65.8%) cases, benign with atypia in 6 (0.9%) cases, inflammatory lesions in 142 (20.8%) cases, suspicious for malignancy in 3(0.4 %) cases and malignant in 73 (10.7%) cases. The remaining1 1(1.6%) samples were deemed to be indeterminate (Table 2).

Table 1: Age and sex distribution of patients with breast complaints presenting to Jimma University Medical Center, southwest Ethiopia over a five-year period (September 2013 to June 2018).

Age (years)	No.		Total No. (%)
	Male	Female	
<20	7	75	82 (12.33)
20-29	13	258	271 (40.75)
30-39	11	141	152 (22.86)
40-49	17	61	78 (11.73)
50-59	14	31	45 (6.77)
60-69	7	20	27 (4.06)
>70	3	7	10 (1.50)
Total	**72**	**593**	**665 (100)**

Table 2: Distribution of breast lesions according to FNAC result among subjects who underwent breast FNAC at JUMC over a five-year period (September 2013 to June 2018)

FNA result	Frequency	Percentage (%)
Benign without atypia	448	65.6
Benign with atypia	6	0.9
Inflammatory lesions	142	20.8
Suspicious	3	0.43
Malignant	73	10.7
Indeterminate	11	1.6
Total	**683**	**100**

The highest number of cancer cases was observed in 2017/2018 where 27(20.6%) of the reported cases were shown to be cancerous, followed by the year 2016/2017 .where19 (15%) cancer cases were reported (Fig 1). The difference was considered to be statistically significant. (P=0.00001).

The most common presenting complaint for the patients diagnosed with breast cancer was breast lump (83.5%) followed by ulceration of the breast (8.2%), breast pain (5.4%), axillary mass (2.7%) and nipple discharge (1.3%).

The average duration of complaints prior to diagnosis of breast cancer was approximately 15 months and than half had features of locally advanced disease such as clinically palpable axillary lymph nodes, invasion of the overlying skin and fixation to the chest wall. (Table 3).

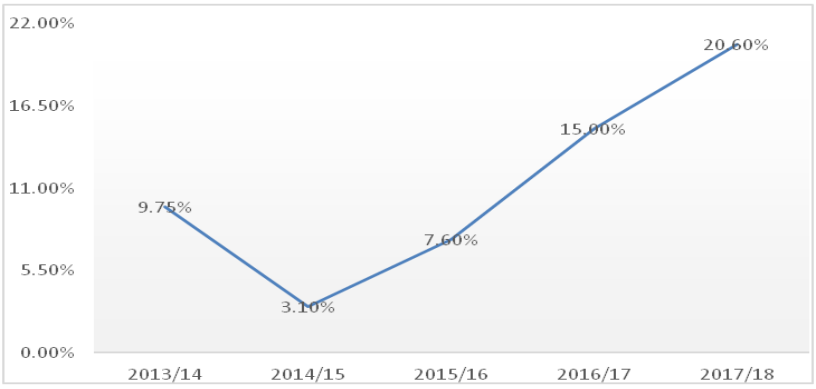

Figure 1: The trend of breast cancer among patients with breast complaints visiting the Pathology Department of Jimma University Medical Center, southwest Ethiopia over a five-year period (September 2013 to June 2018).

Table 3: Frequencies of clinical features in locally advanced malignancies of patients diagnosed with breast cancer at JUMC, southwest Ethiopia over a five-year period (September 2013-June 2018).

Locally advanced breast cancer features	Yes (%)	No (%)	Total
Lymph node involvement	33(45.83)	39(54.17)	72(100)
Skin ulcerations	11(15.28)	61(84.72)	72(100)
Skin retraction (including peau d' orange)	3(4.17)	69(95.83)	72(100)
Chest wall fixation	6(8.33%)	66(91.67%)	72(100%)

The age-specific prevalence of breast cancer among patients with breast complaints was highest in the age group 60-69 years where 12(42.86%) of the cases were diagnosed with breast cancer (Table 4).

The difference was found to be statistically significant. (P =0.000)

Table 4: Overall prevalence of breast cancer by age among patients with breast complaints who underwent FNAC at JUMC, over a five-year period (September 2013 to June 2018).

Age (years)	Breast cancer status		Total (%)	X2= 76.784
	Yes (%)	No (%)		
<20	0(0)	81(100)	81(100)	
20-29	15(5.54)	256(94.46)	271(100)	
30-39	13(8.55)	139(91.45)	152(100)	P =0.000
40-49	11(14.10)	67(85.90)	78(100)	
50-59	15(32.61)	31(67.39)	46(100)	
60-69	12(42.86)	16(57.14)	28(100)	
>70	4(22.2)	14(77.7)	18(100)	
Total	70(10.39)	604(89.61)	674(100)	

DISCUSSION

FNAC is a reliable diagnostic tool in the preoperative evaluation of patients with breast complaints and it has been used in the JUMC pathology department since 1989. The method is among the initial investigative modalities offered to patients with such complaints at JUMC as it is has the advantage of being of low cost, simple, easy and accurate.(15)

Breast cancer is the most common malignancy seen in women worldwide and its incidence has been increasing over the past years, especially in low and middle income countries (4, 16). In this study the prevalence of breast cancer among patients coming to JUMC was 10.39%, lower than the incidence found in a similar study conducted in Sudan (14) which showed 32.67% breast lesions examined were malignant. However the prevalence reported in this study was comparable to what has been reported from a study conducted in Nigeria were around 13% of the cases were found to be malignant (17).

In these study, women in the 60-69 years age group had the highest prevalence of breast cancer. The next highest prevalence was in the age group 50-59 years. This is comparatively older than the distribution seen in a study from Black Lion hospital in Addis Ababa (2) and at United Vision Medical Center, Addis Ababa 16) as well as other African countries such as Zimbabwe and Uganda (10) where the majority of breast cancer patients were in their fourth and fifth decade of life. The exact reason for this disproportion in age distribution is not clear and further study is needed to identify any traits which may have protective role against breast cancer in young women. And in this study there was also a statistically significant association between increment in age and incidence of breast cancer as is reported in most of the literature. (20)

Regarding distribution of breast cancer cases by gender, the female to male ratio was 17:1 which is comparable to other studies conducted in Ethiopia (2). However the rate of male breast cancer was lower compared to studies from other countries such as Finland, Norway, and Philippines.(19)

It was observed that the highest incidence of cancer was noted in 2017/18. The overall trend over the five -year period of the study shows that the prevalence of breast cancer has been increasing except for the decrement seen in the year 2014/2015 and this increment of breast cancer can't be attributed to improvement in the diagnostic capabilities of the center because A similar rising trend in breast cancer cases has been observed in other sub-Saharan African countries such as Zimbabwe, South Africa, Uganda, and Mozambique and also in western countries, but the exact reasons for the increment is unknown (10)

In this study, it was shown that patients who were diagnosed with breast cancer waited for an average of 15 months before seeking healthcare, and more than half of the patients diagnosed with breast cancer already had developed features of locally advanced disease such as lymph node involvement and invasion of the overlying skin, or underlying the chest wall. This finding is unfortunately common in breast cancer patients all over Africa as studies have suggested that around 70% of women in Africa present with a lymph node positive cancer at the time of initial evaluation (20). This may be due to a lack of awareness about the seriousness of the disease and poor healthcare seeking behavior among patients in the study area. It also points to the lack of organized breast cancer screening and detection programs in southwest Ethiopia.

Limitations of the study

Because the data was collected retrospectively from a logbook, the authors were not able to determine certain variables such as pattern of growth and associated risk factors, as well as other clinical and laboratory findings associated with breast cancer. Due to the incompleteness of some of the charts and the fact that the data was only of FNAC outcomes which were not supported by histologic diagnosis, this may further affect the result of the study.

Conclusion and Recommendation

Breast cancer is a common finding among patients in patients coming to the Pathology Department of JUMC for breast complaints. Older females in their fifth and sixth decade of life were the most commonly affected age group. The study has further shown that incidence of breast cancer has shown an increasing trend over the five-year period for which a record review was carried out. Further studies are warranted to determine the specific reasons for why the prevalence of breast cancer has been increasing in the study area in the specified five-year period of the study and why the affected demographics are different.

There should be major educational interventions in the study area to increase the awareness of breast cancer in the population so as to increase the health-seeking behavior in the community and get patients to seek treatment early on.

All stakeholders in the community should work together to establish organized breast cancer screening and detection programs for women living in southwest Ethiopia.

Finally, the authors recommend that JUMC pathology department keep updated records which can be easily accessible for future research. Updating the FNAC request form to include additional information will enable the collection of more data which can lead to making more informed decision. An organized cancer registry should be instituted to give an idea about the magnitude of the problem.

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