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ORIGINAL ARTICLE

Comparison of Breast Cancer Aggressiveness in Young and Older Patients

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ABSTRACT

Objective: To compare aggressiveness of breast cancer in young and old patients.
Study Design: Cross-sectional
Place and Duration of Study: Department of Histopathology, King Edward Medical University, Lahore from 1st January 2016 to 31st December 2018.
Methodology: One hundred and fifty women were divided into young (<40 years) and adult (>40 years) group depending upon their age. Women with breast cancer within 20-80 years were enrolled. Modified Radical-Mastectomy specimens as well as lumpectomy having axillary-clearance were sent to pathological laboratory. Biopsies were fixed in formalin in addition to hematoxylin, eosin staining. Data was documented and aggressiveness of breast cancer within both groups was evaluated on the basis of factors as tumor size, tumor type, lymph nodes, metastasis, tumor staging and tumor grading.
Results: A significant variance in young and adult cases tumor grade, lymph node involvement and tumor size. The young patients had 12.90% cases of metastasis than old only having 4.5% ($p<0.05$). Similarly high tumor stage and aggressive tumors were also seen in young patients when compared with old.
Conclusion: Young patients with breast cancer are more prone towards aggressive carcinoma than older patients.
Keywords: Breast cancer. Metastasis, Tumor grade

INTRODUCTION

Breast is a dynamic tissue and its morphology varies throughout lifetime under the influence of hormonal changes of puberty, pregnancy, lactation and post-menopausal involution. The incidence of breast cancer peaks in reproductive years and wanes off after menopause.[1-2]

In addition to age and reproductive history, life style and environmental factors play a significant role in the development of breast cancer. These factors differ widely all around the globe and hence the disease patterns vary. Ethnic background is an important determinant of disease expression and prognosis of patients.[3] In Pakistan, cousin marriage is another element that determines the gene inheritance patterns and incidence of breast cancer.[4] The customs of timely marriages, multiparity, adequate infant nursing and obesity, seen in our country, largelyimpact the breast cancer manifestations as old age pregnancy, over-weight, nulliparity and absent or decreased breast feeding are important risk determinants of breast malignancy seen in the developed countries.[1,5] The normal breast tissue constitutes ductal epithelial and myoepithelial cells and interlobular and intralobular stroma arranged in ducts and lobules. Each element can serve as a source of both benign as well as malignant disease.[6,7]

A cohort study was conducted on female patients diagnosed with breast cancer showed that a high prevalence of breast cancer patients belonged to the younger group such as below 40 years while the stage of cancer was also advanced in young age group.[8,9] The present study was conducted to find an age-related association between young and older age with aggressiveness of breast carcinoma. The results of this study will help in managing breast cancer patients more efficiently and save millions of lives.

MATERIALS AND METHODS

This cross-sectional study performed at Histopathology Department King Edward Medical University, Lahore from 1st January 2016 to 31st December 2018 and 150 patients suffering from breast cancer age between 20-80 years were enrolled. The sample size was calculated with 95% CI keeping prevalence of breast cancer in young women (age <40) as 31.56%. Modified Radical-Mastectomy specimens as well as lumpectomy having axillary-clearance were sent to pathological laboratory KEMU. Women were divided into young and adult group depending upon their age. Biopsies were fixed in formalin in addition to hematoxylin, eosin staining. Data was documented and aggressiveness of breast cancer within both groups was evaluated on the basis of factors as tumor size, tumor type, lymph nodes, metastasis, tumor staging and tumor grading. Specimens from the breast were initially sectioned and then palpated for identification of masses. Lateral determination was done by axillary-fat as lateral. Margins were stained with ink and relation was identified.

Lymph nodes were submitted after isolation. Specimen description including tumor size, 3 D, color consistencies, cyst identification and fibrosis, necrosis as well as scars was noticed. Sections for representation from nipple-areola complex, skin over the tumor and multiple tumor sections as well as 4 quadrant lesions were then taken for histopathological assessment. Tissue blocks were automatically processed. Data was analyzed by SPSS-25 using Chi square test for analysis. P value was less than 0.05 as significant.

RESULTS

A significant variance in young and adult cases tumor grade, lymph node involvement and tumor size. All these characteristics were significantly higher in young patients than old (p value <0.05) [Table 1].

The reproductive status of patients was also obtained. Left sided breast cancer was seen more commonly (64%) than right sided breast cancer. High grade tumors were seen more frequently (57.3%) than grade II tumors. Seventy eight (52%) tumors were categorized as T2 and their sizes ranged between 2 to 5cm. 37 (24.7%) carcinomas were more than 5cm, 5 (3.3%) tumors were less than 2 cm, while 30 (20%) tumors were aggressive enough to cause skin ulceration and were categorized as T4. The metastasis to regional lymph nodes was seen in 96 (64%) cases, while metastasis to other organs was noted in 12 (8%) cases (Fig. 1).

Stage of the tumors is calculated using the parameters of tumor size, lymph nodes involvement and metastasis. Five cases were stage I, 61 cases were stage II, 72 cases were stage III while 12 cases were stage IV. Taking into account the grade and stage of tumors, 72.2 % tumors were aggressive, accounting for 109 cases. The most common tumor was ductal carcinoma (96%). These tumors showed sheets and cords of pleomorphic malignant cells with variable tubule formation and prominent mitotic figures on microscopy. The mucinous carcinoma was the 2nd most

common tumor (2%). In these tumors, malignant cells were seen floating in extracellular mucin. Two cases of Lobular carcinoma having single file growth pattern and dense lymphocytic infiltrate was also seen (1.3%). Metaplastic carcinoma, a rare malignant tumor of breast was (0.7%) [Fig. 2].

The present study showed that young patients had 12.90% cases of metastasis than old only having 4.5% ($p<0.05$). Similarly high tumor stage and aggressive tumors were also seen in young patients when compared with old (Table 2).

Table 1: Comparison of tumor grade, lymph node involvement and tumor size within young and old patients

Population	Tumor Grade		Lymph Node Involvement				Tumor Size			
	Grade II	Grade III	N0	N1	N2	N3	T1, <2cm	T2, 2 to 5 cm	T3, >5cm	T4, skin ulceration
Young n = 62	15 (24.2%)	47 (75.8%)	16 (25.8%)	12 (19.4%)	25 (40.3%)	9 (14.5%)	-	26 (41.9%)	13 (21%)	23 (37.1%)
Old n = 88	49 (55.7%)	39 (44.3%)	38 (43.2%)	25 (28.4%)	17 (19.3%)	8 (9.1%)	5 (5.7%)	52 (59.1%)	24 (27.3%)	7 (8%)

Table 2: Comparison of metastasis, tumor stage and aggressiveness of tumor in young and old patients

Population	Metastasis		Tumor stage Low	Tumor stage High	Aggressive tumor	
	M0	M1	(Stage I + Stage II)	(Stage III+ Stage IV)	No	Yes
Young	87.10%	12.90%	16.10%	83.90%	4(6.5%)	58 (93.5%)
Old	95.5	4.50%	63.6%)	36.4	37(42%)	51(58%)

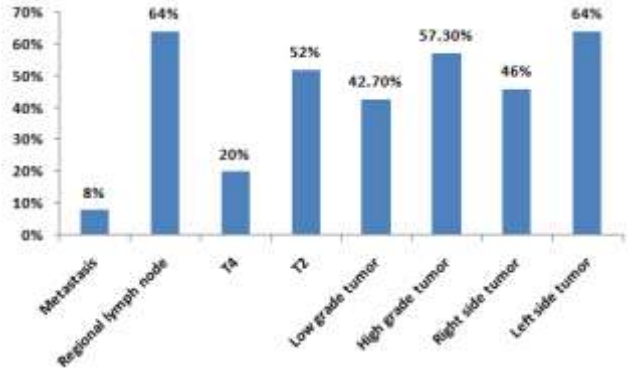

Fig 1: Frequency of various clinical characteristics of breast carcinoma patients

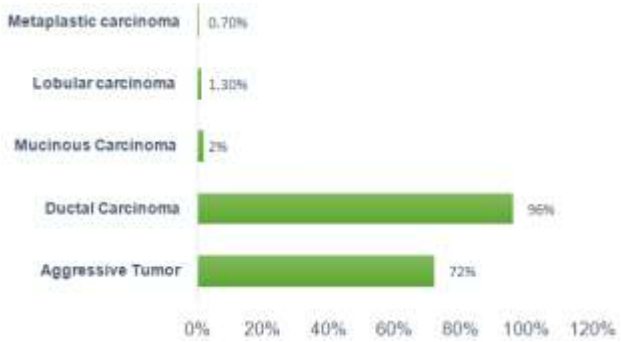

Fig 2: Aggressiveness and types of breast carcinoma in enrolled patients

DISCUSSION

In older patients T1 and T2 tumor size are more frequent (64.8%). This study also demonstrated that greater nodal involvement is seen in breast tumors of young patients, indicating a worst prognosis.[1] The young patients in our study were diagnosed with high grade tumors and greater nodal involvement. Grade III tumors were seen in 75.8% young patients while only 24.2% had grade II tumors. These results are in accordance with a previous study that emphasizes the aggressiveness and mortality associated with young breast cancers. Higher tumor grades and significant nodal involvement ($p<0.001$) is seen in women less than 40 years of age.[6,10]

Global studies reveal that the breast cancer in young patients also differs genetically from tumors of older patients, as it is seen that the risk of familial breast cancer with a positive family history is pronounced in younger age and declines as the age increases.[11,12] Molecular phenotyping studies are emerging exponentially in multidisciplinary setups for assessment of breast cancer in young patients as their disease differ noticeably in prognosis and treatments.[13,14]

Lack of health literacy contributes critically in late presentation of patients to health facilities. Unavailability of health commodities, substandard screening programs, inadequate patient education and poor understanding of disease by masses adversely affects the prognosis.[15] The situation necessitates far-reaching studies to be conducted in our population, including genetic testing and use of immune-markers for better detection and tailored management plans for females of various age groups, presenting with breast lumps.

CONCLUSION

Young patients with breast cancer are more prone towards aggressive carcinoma than older patients with higher metastasis incidence.

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