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Original Research Article

Clinico pathological profile of carcinoma breast in Odisha: a mining state of eastern India

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ABSTRACT

Background: Carcinoma of the breast is the commonest malignancy in indian women. It is a serious health issue, producing increased mortality among indian women. Breast carcinoma is a heterogeneous disease with wide difference in clinico pathological presentation in different parts of the world. This study had been undertaken to evaluate the clinico pathological presentation of carcinoma breast in Odisha which is one of the important mining belts of eastern India.
Methods: It was a retrospective analysis of 1000 eligible histopathology proved non metastatic, post-operative carcinoma breast, treated at Acharya Harihar post graduate institute of cancer, a tertiary cancer hospital of Odisha. The data were retrieved with respect to clinical presentation, pathological finding, stage of the disease and receptor status of the cancer breast patients from the hospital records.
Results: Among 1000 patients the mean age of presentation was 47.25 years, among them 99.2% of the patient were female. Upper outer quadrant lesion was 66.6%. 96.5% of patient presented with invasive duct carcinoma (IDC). Multicentricity was 1.9%. 36.5% presented with lympho vascular space invasion and 23% with perineural invasion. Mean tumor size was 4.24±2.07. 59.6% patient had lymph node involvement. Mean number of lymph node positive was 3.67. Extracapsular invasion was 19.9%. Majority of the patient presented with advanced stage of the disease. ER+, PR+, HER-2 neu negative breast cancer was only 21.5%, triple negative 47.9%, ER-, PR- HER-2 neu ± 15.2%, triple positive 9.1%.
Conclusions: The patient of carcinoma breast in this part of world presented at younger age with advanced stage of the disease having triple negativity and HER-2 neu positive in a greater number of patients which are biologically aggressive, needs early detection and aggressive treatment.

Keywords: Breast cancer, Clinico pathological study, Mining state

INTRODUCTION

Carcinoma breast is one of the commonest malignancy among the females worldwide. The incidence of breast cancer constitutes 11.7% of total malignancies in the world and 24.5% of all cancer in women.[1] In India, the incidence of breast cancer is increasing day by day due to change in life style and increasing awareness which is now emerging as one of the serious health issues among indian women. The crude rate of carcinoma breast in India is 29.9.[2] India is a vast country with various culture and having different life style. Simultaneously, breast cancer is a heterogenous disease with varied clinicopathological profile. Odisha with a population of 4.74 crores is one of the largest mining belts in India and people are exposed to several mining products like coal,

iron ore, cadmium, chromium and quartz.[3] So people of Odisha are more prone to develop various malignancies. In Odisha, among the female, now breast cancer is one of the commonest malignancy constitutes 26% of total malignancies.[4] Few publications have high lightened the clinico-pathological profile of breast cancer in India, but till today there is no data on clinico-pathological pattern of breast cancer from the people of mining state like odisha.[5-7] Here is a study to document the various clinicopathological features like age, sex, site, histopathology, BR score, multicentricity, necrosis, tumour calcification, lymphovascular space invasion (LVSI), perineural invasion (PNI), tumour size, number of lymphnode involvement, pathological stage, hormone receptor status, human epidermal growth receptor amplification (HER-2 neu) in patients of carcinoma breast. This study was undertaken due to scarcity of available literature and to document this clinicopathological profiles of carcinoma breast from mining state like Odisha.

METHODS

It is a retrospective study conducted at Acharya Harihar post graduate institute of cancer (AHPGIC) which is a tertiary cancer hospital rendering the services to the people of 30 districts of Odisha, as well as the borders of West Bengal, Jharkhand and Andhra Pradesh. Relevant data of 1000 eligible targeted patients of carcinoma breast who were treated in the hospital during 2015 to 2017 and those patients who were born, brought up and permanently staying in Odisha were analyzed. Histopathology proved carcinoma breast undergone upfront surgery without any prior chemotherapy or radiotherapy for other malignancy were included in this study. Patients having upfront metastatic disease, those who have received neoadjuvant chemotherapy and patient record having missing data were excluded from the study. Out of 1236 patients who were treated during Jan 2015 to Dec 2017 for carcinoma breast, we selected only 1000 eligible patients for this study. The complete data regarding clinicopathological profile of eligible patients were collected from the clinical case records from the medical record section of AHPGIC. After extracting the necessary records, the data were captured and analyzed using SPSS version v23.

RESULTS

Retrospective analysis of 1000 eligible patients of carcinoma breast, who were treated during 2015 to 2017 were analyzed. It was observed that the mean age of presentation was 47.25 years. 4.1% of the patient were in age group of 21-30 years, 26% in age group 31-40 years, 34.8% patient in age group 41-50 years, 25.6% patient in age group 51-60 years, 8.4% patient in 61-70 years, 1% in age group 71-80 years and 0.1% in 81-90 years (Table 1). 99.2% of the patient were female and only 0.8% patient were male. 67.2% of patients were premenopausal and 32.8% were postmenopausal. Mean age of menarche was 11.82 yrs. 0.004% patient had family history of breast cancer. 50.9% of the patient had lesion at left side, 48.7% right side and only 0.4% of the patient had bilateral breast malignancy. The upper outer quadrant lesion was very common constituting 66.6% followed by upper inner quadrant 8% followed by lower outer quadrant 4.4% and lower inner quadrant 3.3%. In this analysis central lesion was 10.2% and whole breast involvement was 7.5%. Mean size of the primary tumor was 4.24±2.07 cm. On analysis of histopathology, 96.5% patient had IDC, 0.9% had metaplastic carcinoma. 1.5% patient had invasive lobular carcinoma, 0.5% medullary carcinoma, 0.4% with ductal carcinoma in situ. On analysis, 0.6% of patient had grade-I tubule formation, 16.4% had grade-II tubule formation and 83% had grade-III tubule formation. Similarly, 1.7% patient had nuclear atypia grade-I, 60.4% patients had nuclear atypia grade-II and 37.9% had nuclear atypia grade-III. In this study grade-I mitotic activity was seen in 13.3% of patients, grade-II and grade-III mitotic activity seen in 61.4% and 25.3% respectively. The mean BR score was 7.30. In this series, 41.2% patient had grade-III disease, 54.3% has grade-II disease and 4.5% had grade-I disease.

Multicentricity was observed in 1.9% of patient. Tumour necrosis was observed in 45.9% of the patient, tumour calcification was seen in 13.3% of the patients, 12.9% of the patient had extensive intraductal component. Stromal desmoplasia was observed in 15.8% of patients in this series.

LVSI was present in 36.5% of the patients. 23% of the patient had PNI. Nipple areolar complex involvement was 7.8%. Only 1.4% of the patient had margin positive.

The mean number of lymph node retrieved was 15.28. 59.6% patient had lymph node involvement, having mean number of lymph node positivity 3.67. Extracapsular extension was observed in 19.9% patient. Mean NPI score was 4.86.

Majority of the patient had pT2 lesion 66.9%, followed by pT3 20.4%. pN0 was 40.4%, pN1 29.9%, pN2 14.2% and pN3 15.5%. On analysis of stage wise distribution, 3.2% patient were found to be in stage-I, 33.1% patients in stage-IIA group, 26.5% in stage-IIB, 16.5% in stage-IIIA and 4.5% in stage-IIIB, 15.7% patient in stage-IIIC and 0.5% were in stage-IV.

On analysis of receptor status, triple negative subset was 47.9%, ER/PR positive subset 21.5%, HER-2 neu and triple positive subset were 15.2% and 9.1% respectively. Only ER positive was 4.7% and only PR positive was 1.6%.

Table 1: Summary of clinicopathological profile of carcinoma breast.

All parameters	Mean±SD, median (IQR), minimum-maximum, frequency (%)
Age	47.25±10.22 , 46.00 (40.00-55.00), 22.00-81.00
Age group (in years)	
21-30	41 (4.1)
31-40	260 (26.0)
41-50	348 (34.8)
51-60	256 (25.6)
61-70	84 (8.4)
71-80	10 (1.0)
81-90	1 (0.1)
Gender	
Male	8 (0.8)
Female	992 (99.2)
Size	4.24±2.07, 3.80 (3.00-5.00), 0.60-19.00
Site	
Left	509 (50.9)
Right	487 (48.7)
Bilateral	4 (0.4)
Quadrant: UOQ (involved)	666 (66.6)
Quadrant: UIQ (involved)	80 (8.0)
Quadrant: LOQ (involved)	44 (4.4)
Quadrant: LIQ (involved)	33 (3.3)
Quadrant: central (nvolved)	102 (10.2)
Quadrant: whole breast (involved)	75 (7.5)
Histological type	
IDC NOS	965 (96.5)
Metaplastic carcinoma of breast	9 (0.9)
IDC and invasive lobular carcinoma	15 (1.5)
IDC, medullary type	5 (0.5)
IDC NOS with DCIS component	4 (0.4)
IDC NOS, squamous carcinoma	4 (0.4)
Invasive lobular carcinoma	3 (0.3)
IDC NOS, mucinous	2 (0.2)
IDC, focal sebaceous differentiation	1 (0.1)
Medullary carcinoma breast	1 (0.1)
Poorly differentiated carcinoma	1 (0.1)
BR score	7.30±1.09, 7.00 (7.00-8.00), 2.00-9.00
Multicentricity (present)	19 (1.9)
Necrosis (present)	459 (45.9)
Calcification (present)	133 (13.3)
EIC (present)	129 (12.9)
Stromal desmoplasia (present)	158 (15.8)
LVSI (present)	365 (36.5)
PNI (present)	230 (23.0)
Nipple areola involvement (present)	78 (7.8)
Number of lymph node retrieved	15.28±7.65, 14.00 (10.00-19.75), 0.00-48.00
Lymphnode involvement (present)	596 (59.6)
Number of nodes positive	3.67±6.05, 1.00 (0.00-4.00), 0.00-45.00
Exracapsular extension (present)	199 (19.9)
NPI score	4.86±1.22, 4.88 (3.76-5.68), 0.00-7.70
PT stage	
PT1	51 (5.1)
PT2	669 (66.9)

Continued.

All parameters	Mean±SD, median (IQR), minimum-maximum, frequency (%)
PT3	204 (20.4)
PT4	79 (7.9)
N stage	
N0	404 (40.4)
N1	292 (29.9)
N2	142 (14.2)
N3	155 (15.5)
Tumor stage	
I	32 (3.2)
IIA	331 (33.1)
IIB	265 (26.5)
IIIA	165 (16.5)
IIIB	45 (4.5)
IIIC	157 (15.7)
Receptor status	
ER-, PR-, HER-2 neu negative (triple positive)	479 (47.9)
ER+, PR+, HER-2 neu negative	215 (21.5)
ER-, PR-, HER-2 neu positive	152 (15.2)
ER+, PR+, HER-2 neu positive triple positive)	91 (9.1)
ER+, PR-, HER-2 neu negative	47 (4.7)
ER-, PR+, HER-2 neu negative	16 (1.6)

DISCUSSION

The mean age of the presentation was 47.25±10.22 years with majority (34.8%) of the patients presented at age group of 41-50 years, followed by 25.6% at age group of 51-60 years. The above age of presentation in Indian women was approximately 10 years earlier than the western population as per the present study.[8,9] According to Chopra B et al the breast cancer in India mostly peaks at the age of 40-50 years of age.[8] The incidence of male breast cancer was 0.8% in this series which is comparable with the western literature (1%).

67.2% patients were premenopausal and 32.8% patients were postmenopausal at the time of presentation, but in the western literature majority of the patients presents at postmenopausal age group.[10]

Laterality of the breast cancer is an important aspect in western literature which suggests that due to handedness as well as breast hemispheric laterality, breast cancer is common at left side.[11-13] Study also revealed that, the onset of breast cancer was 2 years earlier in left handed patients as compared to right handed patients.[12] But in this study, 50.9% patient presented at left side breast carcinoma and 48.1% at right side which was not statistically significant.

Upper outer aspect of the breast was the commonest site of primary which was also observed in western literature. Tumour location within the breast has been proposed as an independent prognostic factor. Tumour in upper outer quadrant which is most frequent site of tumour location having been associated with improved survival compared to other quadrant.[14,15] In present study, 66.6% of the patients presented with the lesion at the upper outer quadrant which was the commonest site of the primary comparable to other literatures. Besides 10.2% of the patients in this series presented with centrally located tumour which had higher frequency of late stage disease compared to other quadrants. The central quadrant tumours have poor prognosis because of the difficulty in diagnosis in imaging which is responsible for delayed detection and poor outcome. Most common histopathological type was infiltrating duct carcinoma-not otherwise specified which was 96.5%, similar to that found in other literatures.[16] In this study, 41.2% patient had grade-III disease, 54.3% grade-II and 4.5% had grade-I disease. Ghosh et al in their study observed that majority of tumours were grade-III whereas majority of the patients in present study was grade-II disease (54.3%).[17]

The mean tumour size was 4.24±2.07 and 66.9% patient had T2 lesion, 20.4% patient had T3 lesion. Besides, in present study 59.6% patient had node positivity and 19.9% patient had extra capsular extension. Review of Indian literatures also established that Indian women present with advanced primary as well as nodal burden in contrast to western countries.[18-21] Primary tumor size predicts the 15 years mortality in node positive and node negative patients of carcinoma breast. A decline of 1 centimeter primary tumor size was associated with a reduction in 15 years mortality of 10.3% in node positive

and 2.5% in node negative patients. Further in case of decline in primary tumor size of 1.5 cm reduces the 15 years mortality, 23% in node positive and 10.8% in node negative patients.[22] Even though LVSI and PNI not well studied in carcinoma breast, still then these factors represent the aggressiveness of the disease and they have been analyzed in this study. Patient having LVSI positivity had incidence of increased number of lymph node involvement (5.90±7.12 versus 2.43±4.90) in LVSI negative patients. Besides LVSI positive patients had more incidence of extracapsular extension (35.2% in LVSI positive versus 11.10% in LVSI negative), more incidence of PNI (41.5% in LVSI positive versus 12.3% in LVSI negative) which were all statistically significant. Patient having increased tumour necrosis had more incidence of Lymph node involvement (4.06±6.01 versus 3.34±6.08%).

Identification of receptor status is an important prognostic marker that guides the therapeutic management. In the present study the incidence of triple negative breast cancer was 47.9%, ER/PR negative HER-2 neu positive 15.2%, ER/PR positive HER-2 neu negative 21.5%, ER/PR positive HER-2 neu positive was 9.1%. In our study triple negative and HER-2 neu positive patients were higher in comparison to western literature.[23]

In the present series, majority of the patients presented with large primary tumour, extensive nodal burden with advanced stage of the disease, which was contradicting the western literature where majority of the patient presented with early breast cancer. The above advanced stage of presentation is due to lack of effective screening programme, poor access to the health system, younger age of presentation and large number of patients having TNBC and HER-2 neu positive breast cancer which were biologically aggressive.

Limitation of the study

The main limitation of this study is that the present study was a hospital based retrospective observational study. Therefore, this study may not represent the underlying general population.

CONCLUSION

In a mining state like Odisha, patients of carcinoma breast clinicopathologically presented at younger age, advanced stage of the disease and more incidence of triple negative, HER-2 neu positive disease. This facts were not analyzed earlier.

Such group of patients needs active screening and awareness to detect the disease early and biologically aggressive treatment to reduce the breast cancer mortality.

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