

## Original Research Article

# Correlation of the expression of estrogen receptor, progesterone receptor and HER2/neu with the clinical features and the tumour histopathology in patients of breast carcinoma at mahavir cancer sansthan

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## ABSTRACT

**Background:** Breast carcinoma is the most common malignant tumor and the leading cause of cancer death in women, with more than 10,00,000 cases occurring worldwide annually. Its incidence varies from one geographical area to the other.

**Methods:** Cases of all breast conservative surgeries and modified radical mastectomy specimen received for routine histopathological evaluation from the department of onco Surgery, Mahavir Cancer Sansthan, Patna, Bihar, form the source of data for the study.

**Results:** Infiltrating duct cell carcinoma (NOS) type was the commonest type of carcinoma breast in our institute with significant group occurring in more than 45 years of age. ER and PR positive expression was seen in grade 2 tumors and negative expression was seen with tumor size more than 2cm, positive lymph nodes and higher stage of disease. HER2/neu negative expression was seen in the post-menopausal age group, tumor size more than 2 cm, positive lymph nodes and higher stage of disease indicating bad prognosis. HER2/neu expression was inversely related to ER and PR expression. HER2/neu expression was seen in 50% of medullary carcinoma which is rare. Triple negative cases were seen in 22.08% cases of infiltrating duct cell carcinoma indicating bad prognosis.

**Conclusions:** A beforehand knowledge of these immunohistochemical markers can help oncotherapists to initiate a correct form of treatment and improve the survival rate in breast carcinoma patients.

**Keywords:** Breast carcinoma, ER, PR, HER2/NEU

## INTRODUCTION

The breast is a very labile tissue and it undergoes marked changes in its structure throughout the reproductive life. It is under the influence of many hormones such as estrogen, progesterone, prolactin, growth hormone, insulin, corticosteroid and thyroid hormones. It undergoes rapid growth during menarche and fluctuates with menstrual cycles throughout the reproductive life. It undergoes physiological hyperplasia and regression during pregnancy, lactation and puerperium. After the menopause

it undergoes gradual atrophy. In the natural history of breast cancer sequential changes in the breast tissue have been observed which finally end up with the development of malignancy.

Breast carcinoma is the most common malignant tumor and the leading cause of cancer death in women, with more than 10,00,000 cases occurring worldwide annually<sup>1</sup>. Its incidence varies from one geographical area to the other. In India, over 100,000 cases are estimated to be diagnosed annually, As per the ICMR-PBCR data, breast cancer is

the commonest cancer among women in urban registries of Delhi, Mumbai, Ahmedabad, Calcutta, and Trivandrum where it constitute >30% of all cancer in females.<sup>2,3</sup> Many intrinsic and extrinsic risk factors are associated with the development of breast cancer. The intrinsic factors include the prior history of cancer in the opposite breast, a family history of breast cancer, late age at first pregnancy, early menarche, late menopause, nulliparity, prior benign breast disease and a lack of breast feeding. Extrinsic factors include a high fat and calorie intake, alcohol consumption, estrogen supplementation, exposure to radiation etc.<sup>4</sup>

The size of the tumour, status of the regional lymph nodes, peritumoral lymphatic involvement, vascular invasion, the receptor status, proliferative index and the morphological grade of the tumour are definitely proven important prognostic factor in breast cancer. With the advent of new techniques and better understanding of pathogenesis, breast cancer has been studied extensively in relation to various other prognostic factors like DNA ploidy, proliferative activity, S-phase fraction analysis, C-erb B-2, epidermal growth factor, angiogenesis, mutant p53 gene and Bcl-2 protein expression.<sup>5</sup>

However, none of these parameters are shown to have independent significance as a single prognostic factor<sup>6</sup>. But various studies in which more than one prognostic factor were considered together showed better significance in relation to prognosis. For example, longer survival in steroid positive breast cancer is noted when the study group is restricted to premenopausal women. Similarly, the predictive value of estrogen receptor together with nuclear grade is greater than that of either alone.<sup>7</sup>

The usual surgical procedure for carcinoma breast is modified radical mastectomy. The outcome after surgery varies widely. Prognostic information is important in counseling patients about the likely outcome of their disease and alerting clinicians in planning further management. Apart from clinical parameters like age, menopausal status and disease presentation, important prognostic indicators in histopathology are tumor size and extent, histological type, histological grade and lymph node status.<sup>8</sup>

In addition, there are immunohistochemical markers which predict the outcome and they include- (a) estrogen and progesterone receptors (ER, PR)- estrogen and progesterone receptor are transcription factors which when combined with estradiol binds DNA and regulates expression of estrogen responsive genes. The presence of these nuclear hormone receptors is correlated with a better outcome and is an important predictor of response to hormonal (anti-estrogen) therapy. About 80% of carcinomas that are ER and PR positive respond to hormonal manipulation, whereas only about 40% of those with either ER or PR alone respond. ER positive cancers are less likely to respond to chemotherapy. Conversely cancers that fail to express ER or PR have a less than 10%

likelihood of responding to hormonal therapy but are more likely to respond to chemotherapy; and (2) HER2/neu(c-erbB2)- HER2/neu is a monoclonal antigen overexpression of which is associated with poorer survival, but its main importance is as a predictor of response to agents that target this transmembrane protein (eg.; trastuzumab or herceptin).<sup>9,10</sup>

Thus, current therapeutic approaches for breast carcinoma consist of combinations of surgery, postoperative radiation, hormonal treatment, chemotherapy and trastuzumab. The choice between hormonal therapy which has minimal side effects and chemotherapy with well-known morbidity and risks is a major responsibility of the clinician.<sup>11</sup> Accurate and reliable assessment of the ER, PR and HER2/neu status of breast cancers by the pathologist is therefore crucial. Hence the present study was being undertaken to establish a correlation between ER and PR status, HER2/neu overexpression, clinical features and tumor histopathology, and to effectively use these parameters to prognosticate and treat breast cancer.

## METHODS

### Study type

The study type was a prospective, cross-sectional and observational study.

### Study place

The study was carried out at department of pathology, Mahavir Cancer Sansthan, Patna.

### Study period

The study period was from June 2018 to May 2019.

### Inclusion criteria

Modified radical mastectomy and all breast conservative surgery specimens from female patients of all ages, with breast carcinoma.

### Exclusion criteria

Cases where there is extensive tumor necrosis without sufficient viable tumor cells for accurate evaluation of the immunohistochemical results

### Sample size determination

To calculate the sample size for single arm prospective study is as follow:

$$N = \frac{f(\alpha,\beta) \times 2(SD)^2}{d^2}$$

N=number of patients, power of study was 90%, where  $f(\alpha, \beta)$ =10.5 for 90% power; significance level is  $p=0.05$  (5%), the cut off below which we will reject null

hypothesis; effective size=d, was smallest difference in mean that would be clinically meaningful to detect=2.5; and standard deviation (SD)=5.

Therefore, minimum patients were,

$$N = \frac{10.5 \times 2(5)^2}{(2.5)^2} = 84$$

Therefore, in our study minimum number of cases is 84.

The detailed clinical history and results of relevant investigations done will be collected from the patient's case files. For prospective cases, the mastectomy and lymph node dissection specimen will be received at the Pathology department in 10% formalin. In every case the standard protocol for surgical grossing of specimens will be followed. After a detailed specimen description, multiple sections will be taken from the tumour, surgical margins, nipple and areola, non-neoplastic breast, and all the lymph nodes. After conventional processing, paraffin sections of 3-micron to 4-micron thickness, will be stained by haematoxylin and eosin (H and E) for histopathological study. In addition, 4 µm sections will be cut from a paraffin block of tumour tissue and taken on 4 glass slides coated with adhesive (egg albumin), for immunohistochemistry (IHC) to detect ER, PR and HER2/neu overexpression. Immunostaining for all IHC markers were carried out on separate tissue sections for each individual case. Interpretation for each marker was done separately.

#### **Method of evaluation of ER and PR immunostaining**

The respective sections from all 84 cases were studied by selecting the areas showing good cellularity. A minimum of 200 cells per sections were counted for ER positivity and result expressed as positive or negative based on Allred scoring. Percentage of cells showing distinctive brown staining of the nuclei along with intensity of staining were taken into account.

#### **Method of evaluation of HER2/neu immunostaining**

The respective sections from all 84 cases were studied by selecting the areas showing good cellularity. A minimum of 200 cells per section were counted for strong complete membranous staining and result was expressed as positive if 60 or more cells had complete strong membranous staining.

#### **Ethical clearance**

The ethical board clearance was taken before starting of the study.

#### **Statistical analysis**

All statistical analysis, wherever applicable, will be done by using the IBM SPSS Statistics software (version

20.0.0.0). The data will be tabulated and quantitative parameters such as age of patient, menopausal status, etc will be summarised in the terms of mean and median. Standard deviation will be computed to understand the variation present in the data. Percentage expression for positivity of ER, PR and HER2/neu will be estimated along with 95% confidence interval. The differences in the positivity rate between different age groups of women both with pre and post-menopausal status, etc will be tested through Chi square test/Fisher's exact test of significance. McNemar's test of significance; will be employed to evaluate the co-association of the various parameters.

## **RESULTS**

The present study was carried out in the department of pathology, Mahavir Cancer Sansthan, Patna

During the study period a total of 84 cases of Breast carcinoma were subjected to immunohistochemistry.

**Table 1: Age and gender distribution.**

Age (years)	No. of female patients	Percentage (%)
≤30	4	4.76
31-40	17	20.24
41-50	32	38.11
51-60	22	26.19
61-70	8	9.52
>70	1	1.19

The maximum number of patients was in the age group of 41-50 years of age. That comprises 38.11%. The least were above 70 which comprises 1.19%.

Histologically, 77 cases (91.67%) were invasive ductal carcinoma nos. In the present study, the various clinico-pathological parameters in 77 cases of infiltrating ductal carcinoma were analyzed. 44/77 (57.14%) cases were seen in perimenopausal and menopausal age group with 33/77 (42.86%) of cases occurred below 45 years of age.

The size of tumor was more than 2 cm in 71/77 (92.41%) of cases. The grade was well differentiated (grade 1) in 10/77 (12.99%), grade 2 in 51 (66.23%) and of grade 3 in 17/77 (22.08%) of cases.

Metastasis lymph node was seen in 56/77 (72.73%) with less than 4 lymph nodes involved in 30/56 (53.57%) of cases. Out of 56 cases of positive lymph nodes 37.57% cases shows vascular invasion (Table 3). Out of 77 cases of infiltrating ductal carcinoma positive expression of both ER and PR was seen in 44/77 (57.14%) of cases. In 26/77 (33.77%) showed negative expression of both ER and PR. 4 cases showed ER positive and PR negative and 3 cases shows ER negative and PR positive expression. 46/77 (59.74%) showed negative expression for HER2/neu, 10 cases showed HER2/neu membrane positivity with score 2+ meaning equivocal reaction, which was advised for fish

but cannot be done as patients can't afford that due to cost, HER2/neu membrane positivity with score 3 is shown in

21 cases, so in total 21/77 (27.27%) cases were HER2/neu positive (Table 4).

**Table 2: Histological subtype of breast carcinoma.**

Histological subtype	No. of female patients	Percentage (%)
Invasive ductal carcinoma NOS	77	91.67
Lobular carcinoma	2	2.38
Metaplastic carcinoma	2	2.38
Medullary carcinoma	2	2.38
Mucinous carcinoma	1	1.19

**Table 3: Clinicopathological parameters in infiltrating ductal carcinoma (N=77).**

Characteristics	No. of cases	Percentage (%)
<b>Age (years)</b>		
≤45	33	42.86
>45	44	57.14
<b>Tumor size (cm)</b>		
≤2	6	7.79
>2	71	92.21
<b>Histological grade</b>		
Grade 1	10	12.99
Grade 2	50	66.23
Grade 3	17	22.08
<b>Vascular invasion</b>	21	37.50
<b>Necrosis</b>	35	45.45
<b>Lymph node metastasis</b>		
Negative	21	27.27
Positive	56	72.73
<b>Number of lymph nodes involved</b>		
≤4	30	53.57
>4	26	46.43

**Table 4: Expression of ER, PR and HER2/neu in cases of ductal carcinoma (N=77).**

Variables	Number of cases	Percentage (%)
<b>ER and PR expression</b>		
ER+/PR+	44	57.14
ER+/PR-	4	5.19
ER-/PR+	3	3.90
ER-/PR-	26	33.77
<b>HER 2/neu</b>		
Positive	21	27.27
Negative	46	59.74
Equivocal	10	12.99

On correlating ER and PR expression of infiltrating ductal carcinoma with various clinico-pathological parameters, the observation in present study was that ER, PR positive expression has no association with age and size of tumor, their expression was higher in grade 2 tumors 33/44 (75%). The ER, PR negative expression was more in size of tumor being greater than 2 cm 24/26 (92.31%) and positive lymph nodes 15/26 (57.69%) (Table 5).

Out of 77 cases with diagnosis of infiltrating ductal cell carcinoma and correlating the HER2/neu negative expression with clinico-pathological parameters, negative

expression was seen in age groups more than 45 years, in tumor size more than 2 cm 43/46 (93.48%), grade 2 tumors 34/46 (73.91%), positive lymph nodes in 35/46 (76.09%) of cases, with 25/35 (71.43%) more than 4 lymph node positive (Table 6). Out of 77 cases 17 were triple negative for ER/PR/HER2/neu and correlating those cases with clinico-pathological parameters, the number of cases were in age more than 45 years 10/17 (58.82%), all the triple negative cases were of size more than 2 cm, grade 2 is 9/17 (52.94%) and with positive lymph nodes in 10/17 (58.82%) cases, number of lymph nodes more than 4 is 2/17 (11.76%) (Table 7).

Luminal type A tumor is ER and PR positive with moderate tumor grade; these were being commonest HER2/neu negative expression associated with low or molecular subtype (Table 8).

**Table 5: Correlation of ER, PR expression with clinico-pathological parameters in infiltrating ductal carcinoma.**

Clinicopathological parameters	ER+/PR+	ER-/PR-
<b>Age (years)</b>		
≤45	19	10
>45	25	16
<b>Tumor size (cm)</b>		
≤2	3	2
>2	41	24
<b>Histological grade</b>		
Grade 1	2	8
Grade 2	33	12
Grade 3	9	6
<b>Lymph node metastasis</b>		
Negative	8	11
Positive	36	15
<b>No. of lymph node positive</b>		
≤4	19	9
>4	18	6

**Table 6: Correlation of HER2/neu expression with clinico-pathological parameters in infiltrating ductal carcinoma (N=77).**

Clinicopathological parameters	HER2/neu positive (N=21)	HER2/neu negative (N=21)
<b>Age (years)</b>		
≤45	5	10
>45	16	16
<b>Tumor size (cm)</b>		
≤2	1	4
>2	20	43
<b>Histological grade</b>		
Grade 1	5	4
Grade 2	10	35
Grade 3	6	7
<b>Lymph node metastasis</b>		
Negative	9	11
Positive	12	35
<b>No. of lymph node positive</b>		
≤4	4	10
>4	8	25

**Table 7: Clinico-pathological parameters in triple negative cases.**

Clinicopathological parameters	Triple negative cases
<b>Age (years)</b>	
≤45	07
>45	10
<b>Tumor size (cm)</b>	
≤2	0
>2	17
<b>Histological grade</b>	
Grade 1	3
Grade 2	9
Grade 3	4
<b>Lymph node metastasis</b>	

Continued.



Clinicopathological parameters	Triple negative cases
Negative	7
Positive	10
<b>No. of lymph node positive</b>	
≤4	8
>4	2

Table 8: Molecular subtypes.

Molecular subtype	No. of patients	Percentage (%)
<b>Luminal A</b>	30	38.96
<b>Luminal B</b>	16	20.78
<b>Her2 enriched</b>	14	18.18
<b>Basal like</b>	17	20.08

## DISCUSSION

The aim in modern medicine is to identify patients who have an unfavorable prognosis- or even better, to identify patients who may benefit from an improved prognosis resulting from a specific form of treatment. Similar to other carcinomas of various anatomic sites, the development of invasive breast carcinoma also involves multiple genetic alterations-and this has long been exploited for prognostication. Prognostic factors may significantly influence the choice of treatment. There are various well established clinical, cytological and histological prognostic parameters. Lymph node status is the most important independent prognostic factor, and if the tumor involves the lymph nodes, systemic chemotherapy becomes mandatory. Improved breast cancer treatment requires integration of clinical pathology and cancer biology which could affect patient outcome. ER, PR and HER2/neu are well-established procedures in routine breast cancer management mainly as prognostic factors for adjuvant hormone therapy. Our results reveal the significant association of different clinicopathological factors.

In the present study 84 mastectomy cases were assessed for clinico-pathological parameters and for expression of estrogen, progesterone receptors and over expression of human epidermal growth factor receptor 2. Out of 84 cases of carcinoma breast 77 (91.67%) were infiltrating duct cell carcinoma and other variants were 7 (8.33%).

### *Clinico-pathological parameters in infiltrating ductal carcinoma*

In the present study, the various clinico-pathological parameters in 77 cases of infiltrating ductal carcinoma were analyzed. 57.14% cases were seen in perimenopausal and menopausal age group with 42.86% of cases occurred below 45 years of age. In the study by Devi et al 54% cases occurred in the post-menopausal age group.<sup>12</sup>In the study by Ayadi et al 51.6% of cases occurred in less than 50 years of age with median age of 51 years and 46% of cases occurred in less than 45 years.<sup>13</sup> In the study by Raina et al 49.7% of cases occurred in less than 45 years and 48.5% cases in greater than 45 years.<sup>14</sup> In the study by Saxena et

al of New Delhi reported that the median age of occurrence of carcinoma breast was 47.8 years.<sup>15</sup>

The size of the tumor greater than 2 cm in the present study was 92.21% and less than 2 cm was 7.79%. In the study by Devi et al the tumor size greater than 2cm was 90%. In the study done by Lokuhetty et al 58% cases had size of tumor more than 2 cm.<sup>16</sup> Ayadi et al documented in their study that in 12.9% the size of tumor was less than 2 cm and in 87% greater than 2 cm. Mudduwa et al in their study reported that 14.5% of tumors was less than 2 cm and in 85.5% the tumor was more than 2 cm.<sup>17</sup> In the study by Ahmed et al the tumor size was less than 2 cm in 7.5% of cases and 92.4% of cases with tumor size more than 2 cm.<sup>18</sup>

The commonest histological type was infiltrating duct cell carcinoma (NOS) type constituting 91.67% of cases in the present study. In the studies by Devi et al, Raina et al, Lokuhetty et al, Ayadi et al were 78.8%, 92.8%, 86.3% and 83.8% respectively. Infiltrating duct cell carcinoma is graded using modified Bloom Richardson grading system into three grades. In the present study grade 1 tumors were 12.99%, grade 2 tumors were 66.23% and 22.08% tumors were grade 3. In the study by Ahmed et al of Karachi Pakistan documented 4.17% as grade 1 tumors, grade 2 were 75.83% and grade 3 tumors as 20%. Mudduwa et al reported 14.6% as grade 1 tumors, 36.4% as grade 2 tumors and 49% as grade 3 tumors. The grade 1, grade 2 and grade 3 tumors in the study by Ayadi et al was 10.9%, 63.2% and 25.8%.

In the present study lymph node metastasis in infiltrating duct cell carcinoma was seen in 72.73% of cases and negative for metastasis in 27.27% of tumors. The number of lymph nodes positive for metastasis, less than 4 in number was 53.57% and those more than 4 were 46.43%.

In the study done by Devi et al lymph node metastasis in infiltrating duct cell carcinoma was seen in 53.6% of cases and negative for metastasis in 46.3% of tumors and the number of lymph nodes positive for metastasis, less than 4 in number was 55% and those more than 4 were 45%. In the other studies by various authors like Ahmed et al, Mudduwa et al, Park et al, Ayadi et al and Lokuhetty et al

documented lymph nodes positive for metastasis as 74.77%, 57.7%, and 27.8%, 65% and 41% respectively. Vascular invasion was seen in 37.50% of cases in the present study. In the study by Ahmed et al vascular invasion was seen in 35.8% of cases. Tumor necrosis was seen in 45.45% of cases in the present study and commonly associated with moderate and high-grade tumors. In the study by Ahmed et al tumor necrosis was seen in 63.33 % of cases.

### ***Hormonal receptor status and HER2/neu overexpression in infiltrating duct cell carcinoma and other variants of carcinoma breast***

The ER and PR expression in the present study is as follows; ER+/PR+ tumors were 57.14%, ER+/PR- were 5.19%, ER-/PR+ were 3.9% and ER-/PR- were 33.77%. Significant association of ER, PR expression was not seen with size of the tumor and age of presentation. ER and PR positive expression was seen in grade 2 tumors and negative expression was seen with tumor size more than 2 cm, positive lymph nodes and higher stage of disease. In the study done by Devi et al ER+/PR+ tumors were 29.2%, ER+/PR- were 2.4%, ER-/PR+ were 2.4% and ER-/PR- were 65.8% and the expression of both ER and PR receptors was seen in 83.3% of grade 1 tumors, which is contrast from our studies. In the study done by Devi et al, there were no significant association of ER, PR expression with size of tumor and age at presentation. ER+/PR+ expression documented in the other studies by Raina et al, Lokuhetty et al and Ayadi et al was 53.7%, 31.7%, 55.8% respectively.

In the present study out of 77 cases of infiltrating duct cell carcinoma 21 cases (27.27%) showed HER2/neu over expression. Forty-six cases (59.74%) showed negative expression. HER2/neu negative expression was seen in age greater than 45 years 16/46 (34.78%), tumor size greater than 2 cm; 43/46 (93.48%), grade 2 tumors 35/46 (76.09%), positive lymph nodes 35/46 (76.09%), and more than 4 lymph node positives in 25/35 (71.43%) of cases. The study done by Devi et al showed 12.1% of HER2/neu overexpression and 63.4% of negative expression. In that study HER2/neu negative expression was seen in age greater than 45 years 68.75%, tumor size greater than 2 cm 93.75%, grade 1 tumors 75%, positive lymph nodes 50), number of lymph nodes more than 4 was 25%. The HER2/neu over expression in various studies was Lokuhetty et al (84) was 14.5%, Ayadi et al was 18% and Mudduwa et al was 19.1%.

The expression of ER/PR-/HER2-ve (triple negative) tumor in our studies is 17/77 (22.08%). In the study done by Devi et al the triple negative tumors was 29%. In the other study by Moona et al (85) triple negative were in 15% of cases. In the study by Ayadi et al triple negative were in 21.9% of cases. Thike et al reported triple negative cases as 13% in their study. On analyzing these triple negative cases 58.82% were seen in age greater than 45 years, 100% with tumor size greater than 2 cm, 58.82%

cases showing lymph node metastasis. In 11.76% of cases with positive nodes more than 4 lymph nodes involved. In the study done by Devi et al these triple negative cases were 38.7% and was seen in age greater than 45 years, 51.6% with tumor size greater than 2 cm, 29% cases showing lymph node metastasis and in 55.5% of cases with positive nodes more than 4 lymph nodes involved.

The molecular subtypes in the present study were luminal type A constituted 38.96%, basal like 20.08% and HER2/neu type was 18.18%. The similar study was done by Yadav et al in 2016 on 150 patients on hormonal status study and their relation with clinic-pathological factors in breast carcinoma patients.<sup>19</sup> The results in that study was documented as 42.3%, 37.6% and 56.2% expression rate of estrogen receptor, progesterone receptor and HER2/neu respectively. An inverse correlation of HER2/neu expression with ER and PR expression was observed. A significant association of tumor size was observed with ER and PR expression. However, no significant association of lymph node status and histological types was found with receptor expression. In the study 64 done by Devi et al, molecular subtypes as luminal A constitute 26.8%, basal like were 41.4% and HER2/neu was 12.1%.

Estrogen receptor negative and triple negative breast carcinoma carry poor prognosis and are not amenable to hormone therapy. It is observed in literature that Indian patients with carcinoma breast have a higher tendency to have these with negative expression, which is also observed in the present study. Manjunath et al in his study has documented the probable reasons for occurrence of such tumors with variable biological behavior.<sup>20</sup> He suggested that the patients in India are about one decade younger than that of the west, which contributes to high ER negativity as younger patients tend to have more ER negative and more triple negative tumors. In India the patients often present at advanced stage of breast carcinoma, in which ER negativity is likely to be higher.

### ***Limitations***

Limitation of the study was tumor heterogeneity, molecular evolution, cost and loss of follow up for some cases.

### **CONCLUSION**

Breast carcinoma is the most common cancer among Indian females and rising at alarming pace in our population. Infiltrating duct cell carcinoma (NOS) type was the commonest type of carcinoma breast in our institute with significant group occurring in more than 45 years of age. ER and PR positive expression was seen in grade 2 tumors and negative expression was seen with tumor size more than 2cm, positive lymph nodes and higher stage of disease. HER2/neu negative expression was seen in the post-menopausal age group, tumor size more than 2 cm, positive lymph nodes and higher stage of disease indicating bad prognosis. HER2/neu expression was inversely related to ER and PR expression. HER2/neu

expression was seen in 50% of medullary carcinoma which is rare. Triple negative cases were seen in 22.08% cases of infiltrating duct cell carcinoma indicating bad prognosis. A beforehand knowledge of these immunohistochemical markers can help oncotherapists to initiate a correct form of treatment and improve the survival rate in breast carcinoma patients.

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