ORIGINAL RESEARCH

Immunohistochemistry status and clinicomorphological features in breast cancer patients at a Peripheral Cancer Centre

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ABSTRACT
Breast cancer has many clinical and morphological parameters which change the prognosis of these patients like tumor size, lymph node involvement, histological grade of tumor. Oestrogen is a mitogen which shows its effect by binding to its receptor (ER) and is positive seen in 50-80% of breast cancer. A total of 51 consecutive cases done between October 2020 to March 2023 were included in the study. Available data on age, immunohistochemistry, size, grade, lymph node status were retrieved from available records. Grading was done by Nottingham grading system. In this study which included 51 breast cancer cases, 50 were females and 1 male case. Mean age was 48 yrs. Left side breast cancer was slightly more common in our study (54.9%). Infiltrating duct carcinoma was most common histological variant (92.1%) followed by lobular, papillary and medullary variants. Grade 2 was most common (74.5%)-Nottingham grading system. 28 cases (50.9%) belonged to stage II followed by 23 cases of stage III. 32 cases (62.7%) presented with axillary lymph node metastases. In our group of patients we dint find any significant correlation between age of patient and hormonal status on IHC. Also we dint find any association between HER2/neu status and age of the patient. However the incidence of triple negative receptor breast cancer was more in younger age group.
Key words: Immunohistochemistry, clinicomorphological features,breast cancer

INTRODUCTION
Breast cancer is most common cancer among women worldwide.
In India, one in nine people are likely to develop cancer in his/her lifetime [1].
Breast cancer has many clinical and morphological parameters which change the prognosis of these patients like tumor size, lymph node involvement, histological grade of tumor [2].
Oestrogen is a mitogen which shows its effect by binding to its receptor (ER) and is positive seen in 50-80% of breast cancer [3].
HER 2neu is a proto-oncogene and is overexpressed in 15-25% cases [4] Endocrine therapies are targeted to these receptors.

Present study aims to evaluate and correlate the clinical parameters, morphology and hormone receptor status in our patients.

MATERIALS AND METHODS
This retrospective study was done at VTSM Kidwai Peripheral cancer center, Kalaburagi, Karnataka.

INCLUSION CRITERIA
- Modified radical mastectomy.
- Breast conserving surgery.

EXCLUSION CRITERIA
- Lumpectomy, previous neoadjuvant therapy, recurrent tumours, benign lesions, sarcomas,

metastatic tumours were excluded from the study.

A total of 51 consecutive casesdone between October 2020 to March 2023 were included in the study. Available data on age, immunohistochemistry, size, grade, lymph node status were retrieved from available records.

Grading was done by Nottingham grading system [5].

Immunohistochemistry (IHC) was applied to preserved areas of tissue blocks fixed with 10% formalin. Estrogen receptor(ER), Progesterone receptor(PR) were taken as positive if atleast 1% pf tumour cells showed nuclear staining as per allred scoring [6].

Human epidermal growth factor receptor-2/neu(HER2/neu) scoring was done as per American Soceity of Clinical Oncology College of American Pathologists guidelines [7].

3+ on IHC was taken as positive. Equivocal HER2/neu positivity required Fluoroscent*in situ* Hybridization(FISH). Statistical analysis was done using SPSS version 23. Chi-square test was performed and p-values were calculated. P-value less than 0.05 were considered statistically significant.

RESULTS

In this study which included 51 breast cancer cases, 50 were females and 1 male case. Mean age was 48 yrs. Left side breast cancer was slightly more common in our study (54.9%). Infiltrating duct carcinoma was most common histological variant (92.1%) followed by lobular, papillary and medullary variants. Grade 2 was most common (74.5%)-Nottingham grading system. 28 cases (50.9%) belonged to stage II followed by 23 cases of stage III. 32 cases (62.7%) presented with axillary lymph node metastases.(Table 1)

Table1: Clinical & morphological characteristics of study population

Age Interval	Frequency	Percent
Less than or equal to 40 years	19	37.3
More than 40 years	32	62.7
Total	51	100.0
Sex	**Frequency**	**Percent**
Female	50	98.0
Male	1	2.0
Total	51	100.0
Tumor Size	**Frequency**	**Percent**
Less than or equal to 4cms	31	60.8
More than 4cms	20	39.2
Total	51	100.0
Histology	**Frequency**	**Percent**
IDC	47	92.2
ILC	2	3.9
Medullary	1	2.0
Papillary	1	2.0
Total	51	100.0
Grade	**Frequency**	**Percent**
1	3	5.9
2	38	74.5
3	10	19.6
Total	51	100.0
LN status	**Frequency**	**Percent**
Negative	15	29.4
Positive	36	70.6
Total	51	100.0
ER	**Frequency**	**Percent**
Negative	22	43.1
Positive	29	56.9
Total	51	100.0
PR	**Frequency**	**Percent**
Negative	24	47.1
Positive	27	52.9
Total	51	100.0
ER/PR	**Frequency**	**Percent**
ER-positive	5	9.8

PR-positive	3	5.9
ER & PR positive	24	47.1
ER & PR negative	19	37.3
Total	51	100.0
Her2/neu	**Frequency**	**Percent**
Negative	37	72.5
Positive	14	27.5
Total	51	100.0
Side	**Frequency**	**Percent**
left	28	54.9
right	23	45.1
Total	51	100.0
Stage	**Frequency**	**Percent**
II	28	54.9
III	23	45.1
Total	51	100.0

On IHC, 29 and 27 patients expressed ER and PR respectively. HER2/neu was positive in 14(27.5%) patients. On Correlating variables we found statistically significant correlation between triple negative and age of the patient (<40yrs) (Table 2). Also, we found significant association between size of tumour (>4cms) and incidence of axillary lymph node metastasis (Table 3).

Table 2: Triple negative and age of patient

Triple Negative	Age Interval		Total	Chi-square statistic
	Less than or equal to 40 years	**More than 40 years**		
No	11	27	38	4.401 p-value= 0.036**
	28.9%	71.1%	100.0%	
Yes	8	5	13	
	61.5%	38.5%	100.0%	
Total	19	32	51	
	37.3%	62.7%	100.0%	

Table 3:Size of tumour and lymph node status

Tumor Size	LN status		Total	Chi-square Statistic	p-value
	Negative	**Positive**			
Less than or equal to 4cms	13	18	31	5.972	0.015**
	41.9%	58.1%	100.0%		
More than 4cms	2	18	20		
	10.0%	90.0%	100.0%		
Total	15	36	51		
	29.4%	70.6%	100.0%		

In our group of patients we dint find any significant correlation between age of patient and hormonal status on IHC (Table 4a, 4b). Also we dint find any association between HER2/neu status and age of the patient(Table5).

Table 4a

Age Interval	ER		Total	Chi-square	PR		Total	Chi-square
	Negative	**Positive**			**Negative**	**Positive**		
Less than or equal to 40 years	8	11	19	0.013 p-value= 0.909	10	9	19	0.377 p-value = 0.535
	42.1%	57.9%	100.0%		52.6%	47.4%	100.0%	
More than 40 years	14	18	32		14	18	32	
	43.8%	56.3%	100.0%		43.8%	56.3%	100.0%	
Total	22	29	51		24	27	51	
	43.1%	56.9%	100.0%		47.1%	52.9%	100.0%	

Table 4b

Age Interval	ER/PR				Total	Chi-square
	ER-positive	PR-positive	ER & PR positive	ER & PR negative		
Less than or equal to 40 years	2	0	9	8	19	1.989 p-value= 0.575
	10.5%	0.0%	47.4%	42.1%	100.0%	
More than 40 years	3	3	15	11	32	
	9.4%	9.4%	46.9%	34.4%	100.0%	
Total	5	3	24	19	51	
	9.8%	5.9%	47.1%	37.3%	100.0%	

Table 5

Age Interval	Her2/neu		Total	Chi-square statistic
	Negative	Positive		
Less than or equal to 40 years	16	3	19	2.068 p-value=0.150
	84.2%	15.8%	100.0%	
More than40 years	21	11	32	
	65.6%	34.4%	100.0%	
Total	37	14	51	
	72.5%	27.5%	100.0%	

We correlated triple negative status and incidence of lymph node metastasis and found no significant association (Table 6).

Table 6

LN status	Triple Negative		Total	Chi-square statistic
	No	Yes		
Negative	11	4	15	0.015 p-value=0.901
	73.3%	26.7%	100.0%	
Positive	27	9	36	
	75.0%	25.0%	100.0%	
Total	38	13	51	
	74.5%	25.5%	100.0%	

DISCUSSION

Breast cancer is leading cause of death due to cancer in women. It is more common in developed countries [8, 9, 10, 11]. Due to lack of effective screening and awareness, patients present with advanced disease with big tumour size and nodal burden at presentation [12].

The most common histology subtype was Invasive ductal carcinoma [13]. In our study also IDC comprised majority of cases (92%).

Mean age in our study was 48 yrs which was in accordance with Ayadi*et al.*,[14].

A higher incidence of axillary lymph node metastases was observed when tumour size was more than 4 cms, with a statistically significant value <0.05. This is in accordance with study conducted by Xie*et al.*,[15].

Our study also found a statistically significant association between younger age of onset and triple negative cases. This is in accordance with study conducted by Ma *et al.*,[16].

Triple negative cases were associated with increased incidence of axillary lymph node metastases (not significant). This is in accordance with a study conducted by Zubair *et al.*,[17].

In our study no significant association was found between age and ER, PR, hormone receptor positivity status.This is in discordance with sofi*et al.*,which showed hormone receptor positivity in elderly patients [18].

Most of our patients presented with lymph node metastases (70%). This is in accordance with Indian studies conducted by Tacher*et al.*,Rao *et al.*,[19, 20].

Strength of the study is that it was conducted at a peripheral cancer center.This study will provide epideomological data and help compare with national and international studies. Drawbacks are this study being a retrospective study and limited number of study subjects.

CONCLUSION

In conclusion, this study proved increased incidence of axillary node metastases with increasing size of the tumour. Also increased incidence of triple negative cases in young population.

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