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# Therapeutic Decision Making in a Case of Carcinoma Breast

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ABSTRACT

Carcinoma Breast is a clinically and pathologically heterogeneous disease. Carcinoma Breast is the most prevalent aggressive cancer in females and second major reason of mortality rate in after lung cancer of women. Parity compared to ER & PR status is found to be more ER/ PR negative as parity increases. This study is a prospective study conducted on 110 women with carcinoma breast done over a period from December 2016 to June 2018. Prognostic factors such as age, parity, menopausal status and histomorphological factors such as size of the tumor, tumor grade, histological type, axillary lymph node metastasis status was correlated with ER and PR status.

**Keywords:** Breast, Cancer, Carcinoma, Estrogen Receptor, Progesterone Receptor

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## INTRODUCTION

Carcinoma breast is the most common cancer in women in developed countries. In India, breast cancer is second in women after cervical cancer[1]. It is roughly estimated that about 80,000 cases occur annually; differently adjusted age rates between 16 and 25 / 100,000 population[2]. The average age for breast malignancy in Asian countries is between 40 and 50 years, although the maximum age in western countries is between 60 and 70 years. In India, a significant percentage of patients have higher tumor grades and more negative tumor hormone receptors than in the western polulace[3]. In addition to being a reliable predictor, hormone receptors have a function to play in identifying patients for selective therapy and may even be used as a positive prognostic marker.

### Aim of the study

The study aim is to determine the histomorphological prognostic and hormonal receptor status (ER and PR) and their role in therapeutic decision making in carcinoma breast

### Objectives of the study

To study the histomorpholological prognostic factors (tumor size, tumor type, histological grade, and axillary lymph node status) in carcinoma breast. To study the hormone receptor (Estrogen and Progesterone Receptor) status and their correlation with histomorphological factors. To evaluate their role in therapeutic decision making in cases of carcinoma breast.

## REVIEW OF LITERATURE

The earliest known documentation of carcinoma breast was in about 3000-2500 B.C by Smith Surgical Sapyrus[4].The malignancy was diagnosed in a male, but the description included the commonest clinical features. The author in reference to this disease concluded that there is no cure for this disease. The value of surgeries in treatments for early carcinoma breast was first commented in 1st century A.D by De Medicina, Celsus[5].

Moore[6], in 9th century A.D of Middlesex hospital in London stressed on complete excision of breast for malignancy and mentioned that axillary lymph nodes has to be dissected and excised[7-10].

Halsted and Meyer[11] in 1894 coated the term radical mastectomy for surgeries for the treatment for carcinoma breast.

Estrogen receptors were important for prognosis of patients with carcinoma breast were found out by Beatson[10], in 19th century.

A study done by Dutta et al [12] in 75 carcinoma breast patients to analyse hormone receptors, HER2/neu and chromosomal abbreations found increasing trend of ER and PR positivity as the age increases. 25 % of tumors were ER positive in age group 21-30 years which increased to 75% in the age group 71-80. Majority of cases (59%) in their study were postmenopausal. Study found a clear association between ER and PR receptor with menopausal age done in 600 breast cancer cases. ER positivity was significantly related to increasing age and menopausal status. The percentage of premenopausal and postmenopausal women with PR positivity was similar[13]. PR positivity was significantly associated with postmenopausal status (age > 50 years) in an isolated study done by Mohsin et al [14].

Department of Pathology, SKIMS, Srinagar conducted a study on 132 newly diagnosed cases of invasive breast carcinoma found ER and PR positivity rising with increasing age of the patient[15].

The content of ER and PR of primary breast tumors was significantly influenced by the tumor's histological grade. Increased proportion of ER negativity was seen in grade III tumors as compared to Grade I and Grade II. Same pattern was seen with PR receptor status. They concluded that, as the tumor becomes more anaplastic, there was an increase in proportion of ER and PR negative tumors[16]. In a study performed on 500 primary breast cancer specimens, 80 tumors (16%) were classified as histological grade I, 89 (17.8%) were grade II and 331 (66.2%) were grade III. Increased ER and PR receptor positivity was found more towards in grade I than grade III which lacked measurable

ER and PR. The relationship of receptor content and histological grade was enhanced by considering ER and PR simultaneously.[17]

In a study done on 960 patients with breast cancer ER and PR prognostic value was analyzed along with other prognostic factors. They found that for node negative patients, age, tumor size and degree of anaplasia are independent prognostic parameters whereas among node positive patients Progesterone receptor (PR), degree of anaplasia and number of metastatic lymph node are the independent prognostic factors. They concluded that PR is the better and more independent factor for prognosis than ER[18]. In a prospective study of 793 breast cancer cases by Zafrani et al[19] found no correlation between receptor status and axillary lymph node metastases in their study. In a study done by Pinder et al[20] on 465 breast cancer patients found significant associations between lymph node negative disease and ER and PR status. They found that for both lymph node positive and negative tumors, higher grade lesions were more often larger and poor prognosis was associated with ER negative tumors. In lymph node negative tumors, high grade was associated with PR negativity.

## MATERIAL AND METHODS

The present study was prospective analytical study carried out with the number of 110 patients on diagnosed as carcinoma breast admitted in all surgical wards of Krishna Institute of Medical Sciences. The study duration was from December 2016 to June 2018. Relevant Clinical information such as Age, Menopausal status, Parity. Histomorphological factors such as size of the tumor, number of metastised axillary lymph nodes.

## OBSERVATION & RESULTS

The study was done on patients coming to the Breast Clinic of Surgery Department and Krishna Hospital from December 2016 to June 2018. Around 110 patients with breast carcinoma detected by either FNAC/True cut biopsy not treated with neoadjuvant therapy.

**Table 1: Age distribution of breast carcinomas patients**

| Age | No. of patients |
|---|---|
| 30- 35 yrs | 10 |
| 36-40 yrs | 12 |
| 41-45yrs | 16 |
| 46-50yrs | 19 |
| 51-55yrs | 14 |
| 56-60yrs | 15 |
| 61-65yrs | 10 |
| 66-70yrs | 10 |
| >70 | 4 |
| Total | 110 |

Table 1 indicated that the maximum number of patients was between 46-50 years i.e, 19 (17.27%), other age groups were 41-45 years (14.55%), 56-60 years (13.64%), 51-55 years (12.73%), 36-40 years (10.91%), then 9.09% from age groups 30-35 years, 61 – 65 years and 66 – 70 years each. More than 70 years patients were 3.64%.

**Table 2: Age of the patient and ER status when compared**

| Age of patients | Estrogen receptor Positive | Estrogen receptor negative | Total |
|---|---|---|---|
| 30- 35 yrs | 2 | 8 | 10 |
| 36-40 yrs | 1 | 11 | 12 |
| 41-45yrs | 5 | 11 | 16 |
| 46-50yrs | 8 | 11 | 19 |
| 51-55yrs | 12 | 2 | 14 |
| 56-60yrs | 14 | 1 | 15 |
| 61-65yrs | 10 | 0 | 10 |
| 66-70yrs | 9 | 1 | 10 |
| >70 | 4 | 0 | 4 |
| Total | 65 | 45 | 110 |

Table 2 presented, When we compared age groups of the patients and estrogen receptor status which is highly significant ($p < 0.0001$). The patients in younger age group had HIGHER ER NEGATIVE status compared to older age patients.

**Table 3: Tumor Type**

| Tumor type | Number | Percentage |
|---|---|---|
| IBC-NST | 86 | 78.18% |
| Medullary Carcinoma | 15 | 13.64% |
| Mucinous carcinoma | 7 | 6.36% |

| | | |
|---|---|---|
| Neuroendocrine carcinoma | 2 | 1.82% |
| Total | 110 | 100% |

In Table 3, most common type of tumor was IBC-NST (78.18%), followed by medullary carcinoma (13.64%).

## DISCUSSION

Carcinoma Breast is a clinically and pathologically heterogeneous disease. various prognostic factors partake in breast carcinoma. These include age, stage, tumor size, type of tumor, nuclear and histological grade, axillary lymph node metastasis, hormone receptor status such as ER, PR[21,22]. IHC helps to determine the receptor status at the individual cell level, accommodating the problem of tissue heterogeneity within the tumor[23]. IHC technique is relatively simple, inexpensive, and familiar to most laboratories, and results in a permanent glass slide.[24]

The study of Estrogen receptor (ER), Progesterone receptor (PR) expressions in cases of breast cancer was done in our institute. Total 110 cases of breast cancer were obtained within a period of December 2016 to June 2018, which was hospital based, cross sectional study.

## CONCLUSION

ER & PR status relate well with the established prognostic markers like age of the patient, tumor size, parity, histological grade; axillary lymph node metastasis and these factors help is selecting the patients for target therapy. 1) Patients with ER and PR receptor positive status have, Grade I (well differentiated), less aggressive tumors, lower incidence of axillary lymph node metastasis, smaller tumor size, Post menopausal status and lesser parity, 2) Patients with ER and PR negative status have, Grade II and III (moderately to poorly differentiated), highly aggressive tumors, Higher incidence of axillary lymph node metastasis, bigger tumor size, pre-menopausal women and higher parity. 3) The status of ER and PR, Grade of tumor and stating helps with adjuvant therapy decision making.

The women with ER and PR positive status with stage IA, IB, IA with grade I or II would benefit from HORMONAL THERAPY. The women with ER and PR POSITIVE status with stage IIB and IIIA and grade I or II would need a combination of HORMONAL AND CHEMOTHERAPY. CHEMOTHERAPY alone will be beneficial in cases of ER and PR NEGATIVE and grade III patients.

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