

ORIGINAL ARTICLE

RETROSPECTIVE STUDY OF HORMONE RECEPTOR STATUS IN BREAST CANCER PATIENTS IN CENTRAL INDIA

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ABSTRACT

Background: Breast cancer, in India, is the second most cancer in females. Hormone receptor status with ER/PR is now routinely done in patients with invasive carcinoma. We have done single institutional retrospective study with the aim to evaluate the ER, PR receptors in invasive breast carcinomas patients in central India.

Methodology: This retrospective study was done on breast carcinoma patients coming to Sri Aurobindo institute of medical sciences, Indore. Data were collective from medical records of breast carcinoma patients from January 2013 to may 2016. Total 149 cases of histopathologically diagnosed carcinoma breast were registered out of which 144 patients with different histology's were evaluated taking into account various parameters like age, sex, histology, stage, background, menstrual status, hormone receptor status.

Results: Out of 149 patients registered 144 patient's data were available for hormone receptors status. The age range was 25-85 years with a median of 53 years. Out of 144 patients, 78 percent were of invasive ductal carcinoma and 16 percent were of invasive lobular carcinoma. Our data showed total 39 percent patients were positive with both ER and PR (ER+PR+) and 44% patients were negative for both ER and PR (ER-PR-). Overall ER+ was 54% and PR+ was 44%. Out of total 80 hormone positive patients 28 % were only ER positive and 2.5% were only PR positive.

Conclusion: Hormone receptor positive status is low compared to western population and comparable with other Indian population studies.

Keyword- Hormone receptors, Breast cancer

INTRODUCTION

Breast cancer is the second most common cancer among women in India after carcinoma cervix. Where as in western countries breast cancer is the most common malignancy.¹ Breast carcinoma remains as a leading cause of death worldwide. The most important determinant in the treatment and outcome is early and accurate diagnosis.

Beaton's showed the role of estrogen in breast cancer by showing regression of breast cancer following oophorectomy over 100 year's ago.² Estrogen has a role of regulation of epithelial cells differentiation and proliferation. Estrogen works by interacting with estrogen receptor (ER) in the nucleus. Estrogen and progesterone has an important role in the promotion and progression of hormone receptor-positive breast cancer so endocrine therapy is the primary component in the treatment of hormone-sensitive breast cancer in the adjuvant and metastatic settings. Exposure of estrogen for prolonged period is an im-

portant risk factor for breast cancer. Progesterone receptor (PR) expression in normal breast epithelium is regulated by ER.³ Hormone receptor status is considered to be important prognostic factors.⁴ ER and PR status is routinely done nowadays to determine the need of hormonal therapy. We have done single institutional retrospective study with the aim to evaluate the ER, PR receptors in invasive breast carcinomas patients in central India.

METHODOLOGY

Breast cancer patients coming to Sri Aurobindo institute of medical sciences, Indore, from January 2013 to may 2016, were included in this retrospective study after approval from ethics committee of the institute. The histopathology reports and hormonal receptors status were accessed from medical records. We have taken into account the age, histology, stage, menstrual status, hormone receptors. There were to-

tal 149 cases of invasive breast carcinomas were registered. These 149 cases of breast carcinoma patients underwent primary surgery at the center during this period. In the present study, 144 cases of breast carcinoma with different histology were evaluated prior to any Radiotherapy, chemotherapy and hormone therapy. Breast carcinoma cases with unknown hormone receptor status were excluded. Patients with incomplete information were also excluded. Immunostaining was done on thin sections of formalin-fixed, paraffin-embedded tissue, or on sectioned frozen specimens. Initially, 4 to 5 micron sections were cut and mounted on protein-coated glass slides. Sections were heated to uncover hidden protein epitopes and exposed to a primary anti-ER and/or anti-PR antibody. A secondary antibody that recognizes the first, which is attached to an enzyme such as horseradish peroxidase, was then added. This linked enzyme converts substrates like diaminobenzidine into colored molecules upon exposure to a developer. Tissue sections were then counterstained, and the amount of ER or PR protein present was semi-quantitated according to the presence of nuclear staining. If 10% of tumor nuclei stained positive were interpreted as positive for hormone receptor. A semi-quantitative method based on intensity of nuclear staining and distribution of positive nuclei was used for Scoring. A scoring scale was used scoring 1–3 for each of these two components. Weak, moderate and strong staining was shown by 1, 2, 3 respectively. Score 1 referred to < 33%, 2 for 33–66% and 3 for > 66% of positive nuclei for the percentage of stained cells.

RESULTS

The age range (Table.1) was wide (25-85 years) with a median age of 53 years. Out of 144 cases included in our study 142 (98.61%) were females and only 2(1.4%) was male. Maximum numbers of patients were over 50 years. Infiltrating duct cell carcinoma (NOS) was the most common type (78%) followed by infiltrating lobular carcinoma (16%). Other variants were 6% including colloidal, papillary, mucinous carcinoma. Out of total patient population urban population was 68% compared to 32% of rural population. Total 56 % patients were hormone receptor positive either ER or PR. Postmenopausal patients were 57% whereas premenopausal patients were 43%.

Out of 144 patients, 18 % were metastatic, 40% locally advanced and 42% patients were early stage. In our analysis ,hormone receptor status was stratified to assess separately the rates of ER+,ER-,PR-positive (PR+),PR-, ER+/PR+, ER+/PR-, ER-/PR+, and ER-/PR- tumors.

Table 1: Clinical, histological, pathological characteristics of cases

Characteristics	Cases (%)
Age	
<30	7(5.0)
30-50	65(45.0)
>50	72(50.0)
Sex	
Female	142(98.6)
Male	2(1.4)
Hormone receptor	
Positive	80(56.0)
Negative	64(44.0)
Histology	
Invasive ductal carcinoma	112(78.0)
Invasive lobular carcinoma	23(16.0)
Others	9(6.0)
Disease stage	
Early stage	57(40.0)
Locally advanced	60(42.0)
Metastatic	26(18.0)
Background	
Urban	98(68.0)
Rural	46(32.0)
Menstrual status	
Premenopausal	61 (43.0)
Postmenopausal	81(57.0)

Table 2: Hormone receptor status

Hormone receptor status	No. (%)
ER+PR+	56(39.0)
ER+PR-	22(28.0)
ER-PR+	2(2.5)
ER-PR-	64(44.0)
ER+	78(54.0)
PR+	57(40.0)
Strong staining	60(75.0)
Weak staining	20(25.0)

Our data showed (Table.2) total 39% patients were with both ER and PR (ER+/PR+) and 44% were negative for ER&PR(ER-/PR-) receptors. Overall ER positive were 54% and PR positive were 44%. Out of total 80 hormone positive patients 28 % were only ER positive and 2.5% were only PR positive. Strong staining was present in 75% patients compare to 25% weak staining.

DISCUSSION

American Society of Clinical Oncology (ASCO) and the College of American Pathologists (CAP) recommend that both estrogen receptor (ER) and progesterone receptor (PR) analysis should be performed routinely in all invasive breast cancers, and the information be used to select patients for endocrine therapy since there is evidence of potential benefit of PR testing to predict response of ER-negative, PR-positive patients⁵⁻⁷, usually because such tumors may be falsely ER negative.

The responsiveness of a tumor to endocrine therapy is an important parameter in breast cancer management. However, not all patients with breast cancer benefit from endocrine therapy. Tumor showing ER and/or PR can best identify those women who are most likely to benefit from endocrine therapy. Tumors that are negative for ER and PR are unlikely to respond to endocrine therapy and are better served by cytotoxic chemotherapy. Largely due to their predictive value, measurement of these receptors has become a routine part of the evaluation of breast cancers. Our study analyzed 144 patients of breast cancer from central Indian state Madhya Pradesh. The estrogen and progesterone status, clinical characteristics histological subtype, and immunohistochemical staining for receptors were studied. Infiltrating duct carcinoma was found in 78% of patients and was the major histological type of breast cancer, remaining 16 % with lobular carcinoma.

On immunohistochemical (IHC)staining estrogen receptor positivity was found in 54% and progesterone receptor positivity in 44%.The frequency of combined positive estrogen(ER+PR+) and progesterone receptor cases were 39 % and combined negative estrogen and progesterone (ER-PR-)receptor cases were 44%. Overall ER+ were 54% and PR+ were 44%.Overall ER and PR positivity rate is lower in our study then western studies but consistent with other studies done on Indian patients.⁸ In two studies done from India by Desai et al and Vaidyanathan et al showed ER to be 32% and 50 % respectively.⁹⁻¹⁰ Out of total 80 hormone positive patients 28 % were only ER positive and 2.5% were only PR positive in our analysis.

Combined negative estrogen and progesterone receptor status with high frequency have also been reported in several Indian studies.⁹The relationships between menstrual status and hormone receptor status in our study shows higher positivity of ER and PR in postmenopausal patients compared to premenopausal patients. Our study analysis shows that hormone receptor positivity increases with age, which has been proved in many studies. A variation in steroid receptor positivity variation has also been reported in certain Asian population with the lower rates of ER and PR reactivity.⁹ Overall our study shows low hormone receptor positivity compared to western countries population.Environmental, lifestyle, socio-demographic and ethnicity and genetic factors variation are the reasons behind the differ-

ence in hormonal receptor positivity among all populations.¹²

CONCLUSION

Hormone receptor positive status is low compared to western population and comparable with other Indian population studies.

ACKNOWLEDGEMENT

Our sincere thanks to Dr.Sarjana Dutt chief Molecular Pathology at Oncoquest Laboratories New Delhi.

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