Estrogen and Progesterone Receptor Status and Her-2/Neu Over expression in Breast Carcinoma with Relation to Age

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ABSTRACT

Introduction: Carcinoma of the breast is the common malignancy in Pakistani females. The study was conducted to assess estrogen receptor (ER), progesterone receptor (PR) and Her-2/neu over-expression in females with relation to age.

Study Design: Institution based prospective study

Place and Duration of Study: This study was carried out at the Histopathology section in the Department of Pathology, LUMHS, Jamshoro from March 2010 to December 2011.

Materials and Methods: Fifty cases of breast carcinoma were selected to evaluate ER, PR and Her-2/neu over-expression by Immunohistochemistry (IHC).

Results: The predominant histologic morphology was Infiltrating duct cell carcinoma. Majority of the cases presented with grade-II (78.7%) with a mean age of 46.5 years. IHC performed on 50 cases revealed ER +ve in 34 (68%) cases with a mean age of 47.5 years and ER -ve in 16 (32%) cases with a mean age of 44.5 years while PR +ve in 30 (60%) cases with mean age of 44.1 years and PR -ve in 20 (40%) cases with a mean age of 50.1 years. Her-2/neu over-expression was found in 15 (30%) cases with a mean age of 41.6 years and Her-2/neu -ve in 35 (70%) cases with a mean age of 48.6 years.

Conclusion: ER and PR expression was found at a significant level reflecting a good therapeutic and prognostic value but the frequency of Her-2/neu over-expression was high reflecting a bad prognosis.

Key Words: ER, PR, Her-2/neu, breast carcinoma, immunohistochemistry.

INTRODUCTION

Breast cancer is not only a major health concern but it has also psychological and financial effect to the patient and to her family[1]. Despite the fact that breast is an exposed part and readily accessible to self examination and clinical diagnosis but it exerts a great death toll[2]. Globally, breast cancer is the second most common type of cancer after lung[3] and the fifth most common cause of cancer death in women[4]. It affects women of all ages and races[5]. Each year among a million new cases about 45% are diagnosed as breast cancer which cause more than 55% breast cancer related deaths in low and middle income countries[6]. It is estimated that by the year 2020 70% new cancer cases will occur in developing countries and majority of these cancers in females will be of breast[7]. According to report by Pink Ribbion campaign Pakistan in 2008, 90,000 new breast cancer cases are diagnosed annually which cause 40,000 deaths[1]. Pakistan has the highest rate of breast cancer in Asia. In Pakistan about 1 in 9 women get breast cancer while in India it is 1 in 22. Determination of estrogen receptor (ER) and progesterone receptor (PR) receptor status and Her-2/neu over-expression is the most valuable and important primary assessment at the time of a breast cancer diagnosis. Patients with ER and PR positive tumors mostly likely get benefit from endocrine therapy. Her-2/neu is a proto-oncogene associated with tumor aggressive and poor prognosis[8].

MATERIALS AND METHODS

The study was carried out for the first time at the Histopathology section in the Department of Pathology, LUMHS, Jamshoro. This was an institution based prospective study extending from March 2010 to December 2011. Paraffin embedded blocks of fifty cases of breast carcinoma diagnosed on H&E staining were included in the study. The kits were supplied by DAKO and staining was performed by Labelled Streptavidin-Biotin technique (LSAB). Cases were performed in batches. In each batch, five cases were stained with positive and negative controls. A quick score method was used for reporting ER, PR and Her-2/neu receptor status[9,10].

Inclusion Criteria: Cases of all age groups diagnosed as breast carcinoma on H&E staining where included in the study.

Exclusion Criteria: Non malignant lesions of breast and autolyzed tissue were excluded from study.

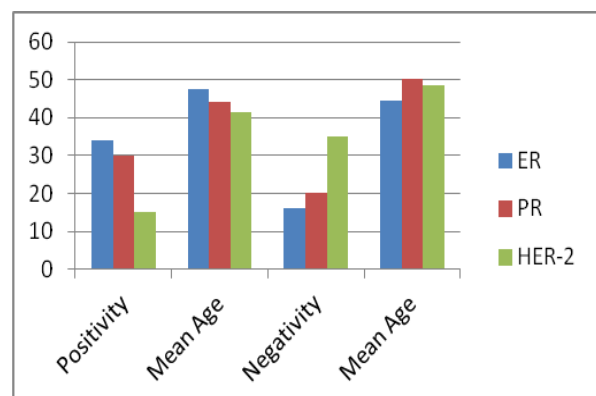**Data Collection:** Printed proforma was used to register the clinical data.

RESULTS

Fifty cases were diagnosed as breast carcinoma by Nottingham Modification of the Bloom Richardson System[11,12,13]. Out of fifty cases were 47 (94%) as Infiltrating Duct Cell Carcinoma (IDCC), 2 (4%) as Mucinous Carcinoma and 1 (2%) as Invasive Lobular Carcinoma. Grading was performed on 47 cases of IDCC which includes 4 (8.5%) grade-I, 37 (78.7%) grade-II and 6 (12.8%) grade-III[14,15]. The age of the patient ranged from 20-70 years with a mean age of 46.5 years. Amongst them 27 (54%) were below 50 years and 23 (46%) were 50 years or above.

Table No.1: Pathologic Characteristics

Variables	Patients Values
Total No: of Patients	50
1. Age of Patients Range Mean age <50 years >50 years	20-70 years 46.5 years 27 (54%) 23 (46%)
2. Tumor type Infiltrating duct cell carcinoma Mucinous carcinoma Invasive lobular carcinoma	47 (94%) 2 (4%) 1 (2%)
3. Grading Grade-I Grade-II Grade-III	4 (8.5%) 37 (78.7%) 6 (12.8%)

Table No.2: Status of Estrogen, Progesterone and Her-2/neu receptor in breast carcinoma with relation to mean age.

Receptor	Positive	Mean Age	Negative	Mean Age
ER	34 (68%)	47.5	16 (32%)	44.5
PR	30 (60%)	44.1	20 (40%)	50.1
HER-2	15 (30%)	41.6	35 (70%)	48.6

Status of ER, PR & Her-2/neu Receptors in Breast Carcinoma with Relation to Mean Age:

Immunohistochemical stains were performed on fifty cases showing ER positivity in 34 (68%) cases with a mean age of 47.5 years and ER negativity in 16 (32%)

cases with a mean age of 44.5 years. PR positivity was found in 30 (60%) cases with a mean age of 44.1 years and PR negativity in 20 (40%) cases with a mean age of 50.1 years. Her-2/neu receptor status was detected positive in 15 (30%) cases with a mean age of 41.6 years and negative in 35 (70%) cases with a mean age of 48.6 years.

DISCUSSION

Breast cancer is a sex hormone dependent neoplasm, affecting females of various age groups. Estrogen plays important role in the pathogenesis and initial proliferation of this tumor. Estrogen binds to its estrogen receptor which function as transcription factors that regulate target gene expression. Nuclear receptors also enhance or suppress transcription by recruiting coactivators and coexpressors, collectively called coregulators. Mutation or aberrant expression of steroid receptor coregulators affect the normal function of these receptors and contribute in the development and progression of cancer[16]. Her-2/neu is a proto-oncogene located on chromosome 17. Her-2/neu encodes a transmembrane glycoprotein with tyrosine kinase activity[17]. Cells transfected with Her-2/neu acquire a more malignant phenotype with stimulation of cell proliferation, invasion and metastasis indicating worse prognosis[18,19,20]. In this study, hormone receptor status was observed in 50 cases. ER positivity was found in 34 (68%) cases with a mean age of 47.5 years and ER negativity in 16 (32%) cases with a mean age of 44.5 years. PR were positive in 30 (60%) cases with a mean age of 44.1 years and PR negative in 20 (40%) cases with a mean age of 50.1 years. The study conducted by Nidal M Almsari and Muhammad Al Hamad[21] on 91 cases showed ER positivity in 52 (57.1%) cases with a mean age of 52.4 years and ER negativity in 39 (42.9%) cases with a mean age of 43.7 years. PR positivity was seen in 52 (57.1%) cases with a mean age of 50.7 years and PR negativity in 39 (42.9%) cases with a mean age of 45.7 years. The study conducted by Soghra Anjarani[22] et all on 22 cases showed ER positivity in 62.4% cases and PR positivity in 61.5% cases. Our study is in concordance with other studies. Hormonal receptor status is important from therapeutic and prognostic point of view, because it provides a guideline for the oncologists to decide about the line of treatment. Patients who are hormone receptor positive respond well to endocrine therapy like Tamoxifen[23]. In this study, Her-2/neu over-expression was noted in 15 (30%) cases with a mean age of 41.6 years and negative in 35 (70%) cases with a mean age of 48.6 years. The study conducted by Nidal M Almsari and Muhammad Al Hamad amongst 91 cases reveals Her-2/neu over-expression in 22 (24.1%) cases with a mean age of 42 years and negative in 69 (75.9%) cases with a mean age of 53 years. In our study, Her-2/neu over-expression was seen slightly at a higher side in

comparison to other studies. Patients who are Her-2/neu positive give response to Transtuzumab (Herception)[24].

CONCLUSION

Our study showed predominantly Infiltrating duct cell carcinoma with grade-II which is having good prognosis and survival. Majority of the cases were hormone receptor positive. Such patients respond well to endocrine therapy. Her-2/neu over-expression was found in 30% cases which is quite alarming as its treatment is very costly and have bad prognosis.

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