

**IMMUNOHISTOCHEMISTRY PROFILING OF BREAST MALIGNANCIES IN A
TERTIARY CARE HOSPITAL IN SOUTH INDIA**Dr. Ponnuswamy Karkuzhali*¹ and Dr. Vijay David Raj. R.²¹Professor and HOD, Department of Pathology, Sree Balaji Medical College and Hospital.²Post Graduate, Department of Pathology, Sree Balaji Medical College & Hospital.***Corresponding Author: Dr. Ponnuswamy Karkuzhali**

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ABSTRACT

Immunohistochemistry (IHC), is a method for localizing specific antigens in cells based on antigen-antibody recognition; Immunohistochemistry (IHC) is used to characterize intracellular proteins or various cell surfaces in all tissues. Individual markers or more often panels of various marker proteins can be used to characterize various tumour subtypes, confirm tissue of origin, distinguish metastatic from primary tumour and provide additional information which may be important for prognosis, predicting response to therapy or evaluating residual tumour post-treatment. **Aim and Objective:** To classify the malignancies of the breast using the recent classification by immunohistochemistry. **Methods:** Cases of Malignant tumour of the breast reported by H&E staining from 2013 to 2016 were stained for ER, PR and Her2/Neu receptors and the results are tabulated. **Results:** Out of 110 breast malignancy cases, Her2 Neu was 36.36%, Luminal A was 18.18 %, Luminal B was 13.63%, and Triple Negative/Basal type was 31.81%. **Conclusion:** Molecular sub-classification of breast carcinomas are feasible in a tertiary care centre by using basic immunohistochemical markers.

KEYWORDS: Breast malignancies, Immunohistochemistry, Prognosis.**INTRODUCTION**

Breast cancer is one of the leading causes of malignancy in women with an incidence of 29% among cancers in India,^[1,2] The conventional method of diagnosing breast cancer through routine histopathology techniques is commonly followed everywhere, yet the recent trends is the usage of immunohistochemistry to know the prognosis and correct therapy of the disease.^[3,4] Immunohistochemistry (IHC) is used to characterize intracellular proteins or various cell surfaces in all tissues. Individual markers or more often panels of various marker proteins can be used to characterize various tumour subtypes, confirm tissue of origin, distinguish metastatic from primary tumour and provide additional information which may be important for prognosis, predicting response to therapy or evaluating residual tumour post-treatment.^[3]

MATERIALS AND METHODS

The aim of the study was to categorize breast malignancy according to molecular receptors to know the prognosis of the disease. It is a retrospective study done for the malignant breast cases received at the Department of Pathology for histopathological diagnosis from the year 2014 to 2016. The sample size of 110 cases (104 ductal carcinoma, 4 lobular carcinoma, 2 medullary carcinoma)

were selected for my study and the clinical data obtained were age, marital status, stage of cancer at diagnosis were taken. The cases reported as malignant lesions of breast (includes most subtypes) were selected and was from all age group and the clinical staging was from I-III. In my study the patients were not previously treated with chemotherapy. The specimen was received in formalin and were first stained with routine Hematoxylin and Eosin for microscopic examination. The blocks containing the malignant tissue was sectioned and stained for immunohistochemical stains using the standard protocols for ER, PR and Her2/neu. Then the slides are interpreted by Assistant Professors and in case of a doubt was submitted to the Professor and the results are interpreted.

RESULTS

The study done in this hospital showed a high incidence of Her2/neu type of intrinsic gene set which has a bad prognosis than Luminal A which has a better prognosis among breast malignancies. The prevalence of the sub-categories seen in Tamil Nadu is compared along to show a better comparison of the various subtypes encountered at our hospital.

Table 1: Data of percentage of prevalence of various intrinsic gene sets.

Receptors	Intrinsic Gene Set	No of cases	Median Age Group	Percentage seen in Sbmch	Prevalence seen in Tamil Nadu ⁵
ER+, PR+, Her2/neu -	Luminal A	21	41 years	19.09 %	35.5%
ER + PR+ Her2/neu +	Luminal B	14	53 years	12.72 %	11.2%
ER- PR- Her2/neu -	Basal type or Triple Negative	36	58 years	32.72 %	22.7%
ER- PR- Her2/neu +	Her2/neu type	39	60 years	35.45 %	30.6%

DISCUSSION

Immunohistochemistry is the method of categorizing a tumor according to the genetic characteristics as well as biomarkers. It is the application of immunologic principles and techniques to demonstrate molecules in cells by use of specific antibody and visualized by chromogens. This helps in identifying and create targeted therapies which are designed to work specific to the malignancy. One of the most important uses of these data is prognosis, that is, to more accurately estimate the risk of breast cancer recurrence in women with early stage breast cancer and to select patients who would benefit most from cytotoxic chemotherapy, at the same time sparing those who would derive little or no benefit from treatment. Hormone receptors^[6] are Estrogen Receptor (ER) and Progesterone Receptor (PR). Estrogen receptor is found in breast, endometrium, ovarian stroma, bone and hypothalamus. The receptor positive tumours have a good prognosis. Progesterone receptors are found in breast, uterus, ovary, skin, and neural tissue. The ErBb2 receptor (Tyrosine Kinase receptor) also called the Her2/Neu receptor. The was derived from human epidermal growth factor receptor and neu was derived from neural tumor glioblastoma of mice. It is a cytoplasmic membrane bound tyrosine kinase receptor and the prognosis is bad if Her2/neu receptor is over-expressed.^[7]

Evaluation of the scoring system is done the H-score is a method of assessing the extent of nuclear immunoreactivity, The score is obtained by the formula: 3 x percentage of strongly staining nuclei + 2 x percentage of moderately staining nuclei + percentage of weakly staining nuclei, giving a range of 0 to 300. Prognosis of the tumour depends on the subtyping. Luminal A has the best prognosis because of its response to Tamoxifen which blocks estrogen receptors. Luminal B has a bad prognosis due to the high proliferation seen with Ki-67 and is known for recurrence. Triple Negative carries the worst prognosis as they do not have hormone and Her2/neu receptors for therapy. Her2/Neu scoring is based on the table 2. Her2/neu works with the drug Trastuzumab only when

it is 3+, the prognosis varies for 2+ which is equivocal and FISH has to be done to rule out polysomy. The drug does not work for 1+.

Score	Expression	Criteria
0	Negative	No staining observed. Staining of membrane is <10% of cells.
1+	Negative	Faint/Bare partial staining of membrane which is >10% of cells.
2+	Weak Positive	Moderate complete staining of membrane in >10% of cells.
3+	Positive	Strong complete staining of membrane in >10% of cells.

CONCLUSION

IHC is now employed in many laboratories for breast lesion to offer the pathologist and surgeon a more reliable prognostic index and treatment option to give an idea about mortality and recurrence of the tumour. Nowadays these tests have become the trusted modality of treatment. Here in my study, we have used IHC to identify ER, PR and Her2/Neu receptors in the breast malignancy cases we have encountered.

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