

Final Report

Project Title: “TO STUDY THE USE OF BIOMARKERS IN BREAST CANCER PATIENTS BY IMMUNOHISTOCHEMISTRY”

SUMMARY

Breast cancer is the most common malignancy all cancers in women and the second most common cause of cancer-related mortality. However, reduction in the mortality will require successful strategies for early detection and screening of the disease. It may allow great help for early identification of breast cancer patients. Breast cancer comprises of distinct biological subtypes having varied spectrum of clinical and pathological with different prognostic and therapeutic implications. Different biomarkers are routinely used in laboratory for diagnosis of breast cancer. Expression of biomarkers in breast cancer helps to identifying and classifying groups of tumors with differing biological behaviors. These biomarkers help not in classification of breast carcinoma (triple negative and triple positive) but also as a potential selection marker for chemotherapy. Moreover, it may offer opportunity to develop new biomarkers by providing additional information supplementing currently available clinical and pathological tests and screening procedures. Effective and early identification can reduce or delay the recurrence of the disease and decrease the morbidity. Present study reveals the significant difference between different subtypes of breast cancer having clinical and pathological features. The features age factor, tumor size, tumor grade, node status, histological type were studied along with immunohistochemical expression of hormone receptors (estrogen and progesterone) growth factor receptor (Her2/neu) and cytokeratin (CK5, 14 & 8/18) receptors status. Our results have revealed that maximum number of patients was found in post-menopausal age group as compared to pre-menopausal women. Among various clinicopathological factors, the histological grade I (59%) tumors were more common followed by grade II. Tumor size showed maximum occurrence of tumor size 2-4.9cm (45%) and a very less count of patients were found with tumor size above 5 cm. Majority of the patients were found with <4 positive node (55%) for metastasis. The majority of patients included in the present study were of infiltrate ductal carcinoma type (93%).

In our study, expression of ER was found to be 74%, maximum quick score showed by patients was counted in 2+ve (20.8%) and minimum score was counted in 4 +ve and 5+ve (9.9%). The expression of PR was found to be 76%, maximum frequency of PR positivity showed by patients was counted in 2+ve (22.3%) and minimum score was counted in 4 +ve (88.8%). 75% patients were found to be positive for the expression of Her2/neu and maximum quick score was counted as 2+ve (38.5%). An inverse correlation of Her2/neu expression with ER and PR expression was observed. The IHC method was further used to subtype the breast cancer in eight categories based on triple positive and triple negative breast cancer phenotypes. Triple positive and negative cases were used to identify the basal and luminal like subtypes based on expression of CK 5, 14 & 8/18. The immunohistochemical expression of CK 5, 14 & 8/18 was found to be positive in 74%, 63% & 85% patients respectively on the basis of cytoplasm membrane stain. A significant association of tumor size with ER, PR & CK5 expression, tumor grade with ER, PR, CK5 & 14 and IDC with CK 5 & 8/18 was observed. We believe that, cytokeratin biomarkers 5 & 14 may be act as as basal like and 8/18 as luminal type of breast carcinoma. In addition, a mixed type of breast carcinoma was also observed. The prognostic and therapeutic value of research work would be examined and validated in further on larger number of samples.

It is a novel study as it was focussed on role of biomarkers to identifying and classifying groups of tumors with differing biological behaviours. The present study has characterized basal & luminal like subtype of breast cancer using immunohistochemistry which may be helpful in making diagnostic panel for the disease. This may facilitate the implement of this panel into routine histopathological laboratories which will leads to the early and improved patient diagnosis and prognosis. Early diagnosis affects the treatment strategies so as to improve the outcome of the disease. Expression of biomarkers is more prognostic significance than traditional prognostic factors. This study will provide an insight of identification of novel markers in the breast cancer patients. Early detection, aggressive surgery and chemotherapy are effective ways to achieve better results of treatment and lower death rate caused by carcinoma.