OA_Molecular Subtypes of Breast Cancer by Immunohistochemical Profiling

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Abstract:

Objective: To evaluate the frequency of molecular sub types of breast cancer on core needle biopsy and to correlate the subtypes with these clinico-pathologic parameters: age of the patient, histologic type and grade of cancer and lymph-vascular invasion (LVI).

Methods: A cross-sectional, observational study, conducted at Dow University of Health Sciences, Karachi, from December 2014 to December 2015. It included core needle biopsies of 285 patients of breast cancer. Immunohistochemical staining with antibodies for Estrogen Receptor (ER), Progesterone Receptor (PR) and Human Epidermal Growth factor 2 (Her 2) was performed and breast cancers were classified into four molecular subtypes: Luminal A (ER/PR +, HER2-), Luminal B (ER/PR +, HER2+), Triple Negative Breast cancer (TNBC) (ER/PR -, HER2-) and HER 2 (ER/PR -, HER2+). Clinical parameters were compared using chi-square test.

Results: 285 cases were included in this study. The mean age of the patients was 43.3 years (17-88). The frequency of the molecular subtypes of breast cancers was Luminal B 139(48.77%), Luminal A 60(21.05%), Her2 54(18.94%) and Triple Negative Breast cancer 32(11.22%). The most common diagnosis of breast cancer was Invasive Ductal Carcinoma 258 (90.52%) and grade II 230 (80.70 %). There was significant association of molecular subtype of breast cancer with the grade of tumor ($p<0.001$) and with lympho-vascular invasion ($p<0.011$). Her 2 cancers showed the highest frequency of grade 3 and Triple Negative Breast cancer had the highest frequency of lymph-vascular invasion.

Conclusion: Luminal B is the most common molecular subtype of breast cancers in our population. The mean age of breast cancer was younger than most studies. We recommend that the molecular subtyping of breast cancers using immunohistochemistry should be incorporated into histopathology reporting of core needle biopsies, as this may facilitate the clinicians in selection of treatment for the patients.

Key words: Breast cancer, molecular subtypes, receptor status, hormone receptors, immunohistochemistry, Triple negative breast cancer, ER, PR, HER2, HER2/neu