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Breast cancer in Ethiopia: Evidence for geographic difference in the distribution of molecular subtypes in Africa

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Background: Breast cancer is a heterogeneous disease with several morphological and molecular subtypes. Widely accepted molecular classification system uses assessment of Estrogen Receptor (ER), Progesterone Receptor (PR), Human Epidermal Growth Factor Receptor 2 (HER2) and proliferation marker Ki67. Few studies have been conducted on the incidence and molecular types of breast cancer in Sub-Saharan Africa. Previous studies mainly from Western and Central Africa, showed breast cancer to occur at younger ages and to present with aggressive features, such as high-grade, advanced stage and triple-negative phenotype (negative for ER, PR and HER2). Limited data from East Africa including Ethiopia however shows hormone receptor negative tumors to account for a lower proportion of all breast cancers than has been reported from elsewhere in Africa.

Methods: In this study from Tikur Anbessa Specialized Hospital, 114 breast cancer patients diagnosed between 2012 and 2015 were enrolled. ER, PR, Ki67 and HER2 receptor status were assessed using immunohistochemistry from tissue microarrays. FISH was used for assessment of gene amplification in all equivocal tumor samples and for confirmation in HER2-enriched cases.

Results: The distribution of molecular subtypes was: Luminal A: 40%; Luminal B: 26%; HER2-enriched: 10%; TNBC: 23%. ER were positive in 65% of all tumors and 43% the cases were positive for PR. There was statistically significant difference in median age at diagnosis between the molecular subtypes ($P < 0.05$). There was a bimodal distribution of molecular subtypes in different age ranges with Luminal B subtype being more common at younger ages (median=36) and Luminal A subtype more prevalent at older ages (median=42). There were no statistically significant differences in tumor grade, histology and stage between the molecular subtypes of breast cancer.

Conclusion: The present study detected Luminal A breast cancer to be the most common subtype and reveals a relatively low rate of hormone receptor negative and TNBC. Our findings and results from other East African studies suggest geographic variability in the distribution of the molecular subtypes of breast cancer in Africa and hence have important clinical and policy implications for breast cancer control and treatment in Ethiopia.

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