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Correlation between Calpain 1 Expression and Proliferating/Apoptotic Index and Prognostic Factors in Triple Negative Breast Cancer

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Abstract : Background: Breast cancer is the most common cancer in women worldwide. Triple-negative breast cancer (TNBC) is an aggressive type of breast cancer, which is defined by the absence of Estrogen (ER), Progesterone (PR) and Human epidermal growth factor (Her-2) receptors. The calpain system plays an important role in many cellular processes including apoptosis, necrosis, cell signaling and proliferation. The role of clapins in pathogenesis and tumor progression has been studied in certain cancer types; however, its definite role is not yet established in breast cancer especially in the TNBC subtype. Objectives: This study aims to measure calpain-1 expression and correlate this measurement with the proliferating/apoptotic index as well with the prognostic factors in TNBC patients' tissue. Materials and Methods: Thirty nine paraffin blocks from patients diagnosed with TNBC were used to measure the expression of calpain-1 and Ki-67 (proliferating marker) proteins using immunohistochemistry. Apoptosis was assessed morphological and biochemically using conventional Haematoxylin and Eosin (H&E) staining method and terminal deoxynucleotidyl transferase-mediate dUTP nick and labeling (TUNEL) assay respectively. Data was statistically analyzed using Pearson X2 test of association. Results: Calpain-1 content was visualized in the nucleus of the TNBC cells and its expression varied from low to high among the patients tissue. Calpain expression showed no significant correlation with the proliferating/apoptotic index as well with the clinicopathological variables. Apoptotic counts quantified by H&E staining showed significant association with the apoptotic TUNEL assay, validating both approaches. Conclusion: Although calpain-1 expression showed no significant association with the clinical outcome, its variable level of expression might indicate a hidden role in breast cancer tissue. Larger number of samples and different mode of assessments are needed to fully investigate such role. Exploring the involvement of calpain-1 in cancer progression might help in considering it as a biomarker of breast cancer.

Keywords : breast cancer, calpain, apoptosis, prognosis
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