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RANK and RANK-ligand immunohistochemical expression in breast carcinomas of young patients

Ola Elbhlool, Samar Elsheikh and **Mona Abdel Hadi**
Alexandria University, Egypt

In Egypt, breast cancer represents 37.5% of female cancer cases according to the Egyptian National Cancer Institute. Breast cancer risk factors, clinical outcomes, and tumor biology are somewhat different in women below the age of 40 years, suggesting that breast cancer in young women represents a distinct entity. Receptor activator for nuclear factor κB ligand (RANKL) is a key factor in bone resorption. It binds to the receptor activator for nuclear factor κB (RANK) on the osteoclast to promote osteoclastogenesis, which results in bone destruction, osteoporosis and osseous metastasis. RANKL was shown to be vital in mediating distant metastasis in breast cancer mice models. The present study aimed at the evaluation of RANK and RANKL immunohistochemical expression in breast carcinomas of young women and the correlation of their expression with the different clinicopathological parameters. The study comprised of 50 cases of breast carcinoma in women <40 years, retrospectively retrieved from the archives of the Pathology Department, Faculty of Medicine, Alexandria University. Representative sections from all tumors were stained with both RANK and RANKL antibodies and the H-score was calculated for each case. A significant correlation was found between RANK immunohistochemical score and the progesterone expression status of the tumors as well as tumor multifocality/multicentricity. RANKL immunohistochemical scores were significantly higher in HER2/neu-positive tumors, recurrent tumors and EIC-positive tumors. The results strengthen the possibility of a role played by the RANK/RANKL pathway in tumor recurrence and multifocality and also points to a possible role in the aggressive behavior of HER2/neu-positive tumors.

Ola62live@yahoo.com

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