Expression distribution of cancer stem cells, epithelial to mesenchymal transition, and telomerase activity in breast cancer and their association with clinicopathologic characteristics

ABSTRACT

A total of 167 surgically resected primary invasive breast carcinomas and 63 metastatic lymph node lesions were analyzed for immunohistochemical (IHC) localization of the CD44+CD24−low breast cancer stem cell (CSC) markers, epithelial to mesenchymal transition (EMT) markers, and telomerase activity by double-staining IHC technique, in formalin-fixed, paraffin-embedded tissue, the results were validated by double-staining immunofluorescent and flow cytometry techniques. The results showed that CSCs with CD44+CD24−low phenotype were significantly increased in node-positive tumors, high-grade tumors, and ductal carcinoma in situ (DCIS). There was a high incidence of telomerase expression in metastatic lymph node lesion. There were considerably high number of tumor cells with EMT expression in metastatic lymph node lesion, and triple-negative tumor. The occurrence of EMT phenomena was usually accompanied by the co-existence of CSCs of CD44+CD24−low phenotype. There was no association between the existence of CSCs and detection of telomerase activity in tumor cells. Increased numbers of both CSCs of CD44+CD24−low phenotype and cells under-went EMT in DCIS lesion might be an initial step in the stromal invasion and propagation of breast cancer, and occurrence of EMT in the breast tumor associated with high prevalence of CSCs, promoting tumor invasiveness and metastasis.