

CK19, CK20, EGFR and HER2 status of circulating tumor cells in patients with breast cancer

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ABSTRACT

Aims and background. The major cause of death in breast cancer patients is metastasis. Various biomarkers have been used for the early detection of circulating tumor cells in the peripheral blood of breast cancer patients. The aims of the current study were to analyze circulating tumor cells in the blood of breast cancer patients by investigating EGFR, CK19, CK20 and HER2 expression profiles and to evaluate their prognostic importance.

Methods. CK19, CK20 and EGFR gene expression profiles were evaluated in the blood samples of 84 female patients with primary invasive ductal breast cancer and 20 healthy female volunteers using SYBR green-based real-time qPCR assays. HER2 expression analyses were conducted in 46 patients who had an HER2-positive primary tumor and in 30 healthy women to determine the cutoff level of positivity.

Results. The positive rates of CK20, EGFR, CK19 and HER2 mRNA expression in the peripheral blood were 28.57% (24/84), 20.23% (17/84), 5.95% (5/84) and 2.17% (1/46), respectively. The high positive ratio of CK20 mRNA expression in the peripheral blood of breast cancer was identified for the first time in the current study. Significant differences were identified in CK20 expression status and several clinical parameters related with aggressiveness of tumors using a binary logistic regression analysis. Higher CK20-positive levels were observed in patients who had lymph node metastasis and advanced-grade primary tumors, which were estrogen receptor-negative. We have demonstrated that CK20 may be a novel biomarker that is useful to identify circulating tumor cells and predict breast cancer progression.

Conclusions. The results suggest that the investigation of CK20 mRNA with other biomarkers in the peripheral blood of breast cancer patients may be useful to monitor the presence of disseminated tumor cells in the blood circulation and to predict the prognosis of breast cancer.

Key words: breast cancer, circulating tumor cells, prognosis.

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