REAL TIME QUANTIFICATION OF CK-19 POSITIVE CELLS IN PERIPHERAL BLOOD OF BREAST CANCER PATIENTS

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Abstract

The detection of occult carcinoma cells in patients with breast cancer has been shown to predict disease recurrence and metastasis. We previously reported the development of a sensitive and quantitative RT-PCR hybridization assay relying on luminometric detection of CK19 mRNA to identify breast carcinoma cells in peripheral blood. To improve on molecular detection of breast carcinoma cells in blood, we have developed a sensitive and quantitative assay using real-time PCR identifying transcripts of the CK19 gene. We analysed blood samples from 28 female healthy blood donors, 43 patients with breast cancer (stage I/II) postoperatively, before and after adjuvant chemotherapy and 14 with verified metastasis and under chemotherapy. The method can clearly distinguish 1 MCF-7 cells in the presence of 10\(^6\) normal PBWM and is highly specific as none of the healthy controls tested (n = 28) had detectable CK-19 mRNA levels. Out of the 43 patients with early breast cancer, CK19 mRNA\(^+\) cells were detected in 29 (67.4%) before and 11 (25.5%) after chemotherapy, respectively, and 10 out of the 14 patients with metastatic breast cancer (71.4%) were also found positive. Analysis using this real-time quantitative PCR for CK19 mRNA may prove to have clinical implications in the assessment in peripheral blood of breast cancer patients. Application of this technique in a clinical population may improve diagnosis and monitoring of breast cancer and its validation is currently ongoing.

Keywords: real-time PCR, breast cancer, CK-19, micrometastasis.