Detection and clinical implications of early systemic tumor cell dissemination in breast cancer.

Abstract:
Blood-borne distant metastasis is the leading cause of cancer-related death in breast cancer. The onset of this fundamental process can now be assessed in cancer patients using ultrasensitive immunocytochemical and molecular assays able to detect even single metastatic cells. Analyses of bone marrow (BM) samples show that disseminated cells are present in 20-40% of primary breast cancer patients without any clinical or histopathological signs of metastasis. The common homing of circulating breast cancer cells in BM is indicative for systemic tumor cell spread and predictive for growth of overt metastases in relevant organ sites such as bone, lung, or liver. Recent clinical studies involving more than 3000 breast cancer patients demonstrated that the presence of tumor cells in BM at primary diagnosis is an independent prognostic factor for unfavorable clinical outcome. To date, sampling of BM, however, is not a routine procedure in clinical management of breast cancer patients. Therefore, several research groups have developed sensitive assays for detection of circulating tumor cells in peripheral blood. Studies evaluating the clinical relevance of these blood assays are ongoing. Here, we will review the existing tumor cell assays and discuss their current clinical relevance and perspectives for the clinical management of breast cancer patients.
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