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The potential of circulating tumor cells (CTCs) in personalized management of breast cancer: A systematic review

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Circulating Tumor Cells (CTCs) detection and characterization in the peripheral blood of breast cancer patients has proven practical and predictive value in different studies. However, the clinical significance of CTCs enumeration and molecular characterization in personalization of breast cancer diagnosis and treatment remains under the debate. A literature search in PubMed, Web of Science and Scopus was performed from October 1990 to June 2016 for studies evaluating CTCs and its association with clinical and pathological characteristics and medical outcome in the field of breast cancer personalization for both diagnosis and treatment categories. The treatment outcomes were Progression-Free Survival (PFS) and Overall Survival (OS) or relapse in different patients. 69 studies met the inclusion criteria. The sample size varies from 1 to 2026. Median follow-up was 15 months (range 3-27). Different molecular techniques have been applied for research but they mostly are based on CTCs enrichment and then detection by using FDA-approved Cell Search™. By far the most studies define CTCs as cytokeratins (CK) positive and CD45 negative cells. Despite the differences in methodology, 32 studies for breast cancer diagnosis and prognosis were mainly focused on CTCs isolation and enumeration. 37 researches were about CTCs count and exact molecular characterization. In the way of precision treatment, detection of CTCs before initiation of first-line therapy or during therapy in patients with breast cancer is highly valuable but in the way of precision medicine it should be supported with some molecular characteristics of CTCs like CTCs phenotypic changes, gene expression analysis of CTCs and molecular characteristics of CTCs.

Biography

Fatemeh Khatami is a PhD Scholar at Tehran University of Medical Sciences. Her experience enhanced her knowledge of laboratory techniques and clinical aspects of cancer genetics and epigenetics. She has published more than 8 papers in biomedical journals.

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