

Platelet-Derived Procoagulant Microparticles as Blood-based Biomarker of Breast Cancer

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Abstract

Objective: Breast cancer is the main cause of cancer death in women worldwide. Elevated plasma levels of circulating cell-derived microparticles (MPs) have been reported in various types of cancer, including breast cancer, with the ability to mediate inflammation and thrombosis. Microparticles are bioactive agents, and it has been suggested that MPs can be used as a diagnostic, prognostic, or therapeutic biomarker in various diseases. The aim of this study was to investigate the levels of platelet-derived MPs (PMPs) in breast cancer patients. **Materials and Methods:** In this case-control study, 30 patients with breast cancer and 20 normal subjects were sampled after obtaining written consent. MPs were isolated from blood samples by centrifugation technique. CD42b and annexin V markers were used respectively for counting PMPs and procoagulant MPs with flow cytometry. **Results:** Flow cytometry results showed that the number of PMPs and procoagulant annexin V positive MPs was significantly higher in the breast cancer patients than normal subjects ($p < 0.001$). The number of the annexin V MPs differed significantly in patients with high tumor size (T2) compared to the patients with low tumor size (T1) and controls ($p < 0.001$). Significant and positive correlations were found between PMP levels and tissue-based biomarkers, tumor grading, and distant metastasis ($P < 0.05$). Tumor histological type did not correlate with the numbers of PMPs ($p = 0.065$). **Conclusion:** Increased levels of PMPs and activity in terms of hemostasis and having a positive and significant relationship with tumor grading and metastasis may indicate the effective role of PMPs in the pathogenesis and prognosis of breast cancer. © 2021. All Rights Reserved.

Author keywords

Breast cancer- microparticle- platelet- prognostic