

Plasma mammaglobin messenger RNA in breast cancer patients as an addition to serum tumor

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Breast cancer (BC) is the most frequent malignant tumor in women worldwide; its recurrence is a result of undetected metastasis present at the time of primary patient treatment. The detection of cell-free RNA in plasma and serum of human subjects has found increasing applications in the field of medical diagnostics. This study aimed at evaluating plasma mammaglobin mRNA as a useful tumor marker for the diagnosis and the detection of metastasis in breast cancer at the time of diagnosis either alone or in combination with conventional serum tumor markers CA15.3 and/or CEA. This study included 40 Egyptian females with primary breast cancer and 25 with different benign breast diseases. The BC group was classified into 24 patients with localized BC and 16 patients with metastases. All patients were subjected to routine laboratory investigations, estimation of serum CA15.3 and CEA by electrochemiluminescence immunoassay and detection of plasma mammaglobin mRNA by using nested reverse transcriptase polymerase chain reaction (RT-PCR). There was a significance increase in plasma mammaglobin mRNA expression, CA15.3 and CEA levels in BC group as compared to benign group ($p < 0.001$). No significant difference was observed between levels of plasma mammaglobin mRNA expression in patients with tumor's size or grade. No correlation was observed with plasma mammaglobin mRNA levels and tumor size or grading, CEA and CA15.3. There was a significant difference ($p < 0.05$) and a positive correlation between CA 15.3 and CEA levels in patients with tumor size and grading. Expression of plasma mammaglobin mRNA has the highest sensitivity, specificity and diagnostic accuracy for both BC and BC with metastasis (75%, 92% & 81.5%) and (87.5%, 45.8% & 62.5%), respectively. To improve diagnostic efficacy of BC, the use of combined tests, expression of plasma mammaglobin mRNA and CA 15.3 improved the sensitivity, specificity and diagnostic accuracy to 90%, 80% & 86.2%, respectively; as well as in BC with metastasis to 100%, 79.2%, & 87.5%, respectively. In conclusion, plasma mammaglobin mRNA alone or in combination with CA15.3 may be used as a valuable noninvasive approach for the diagnosis and the detection of metastasis in breast cancer at the time of diagnosis.