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Quantitative analysis of plasma cell-free DNA and its DNA integrity in patients with metastatic breast cancer using ALU sequence

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Background: Breast cancer (BC) is the most common cancer affecting women. DNA is normally released from an apoptotic source which generates small fragments of cell-free DNA, whereas cancer patients have cell-free circulating DNA that originated from necrosis, autophagy, or mitotic catastrophe, which produce large fragments.

Aim: Differentiate the cell free DNA levels (cfDNA) and its integrity in breast cancer patients and control group composed of benign breast lesions and healthy persons. Methodology: cf-DNA levels were quantified by real-time PCR amplification in breast cancer patients (n = 50), breast cancer lesions(n = 25) and healthy controls (n = 30)using two sets of ALU gene (product size of 115 bp and 247-bp) and its integrity was calculated as a ratio of qPCR results of 247 bp ALU over 115 bp ALU.

Results: Highly significant levels of cf-DNA and its integrity in breast cancer patients compared to control groups. Twenty-eight (56%) patients with breast cancer had metastasis. ALU115 qpcr is superiorto the other markers in discriminating metastatic patients with a sensitivity of 96.4% and a specificity of 86.4% and (AUC= 0.981).

Conclusion: ALU115 qpcr could be used as a valuable biomarker helping in identifying high risk patients, indicating early spread of tumor cells as a potential seed for future metastases.

Biography

Amal Fawzy is an assistant professor of clinical pathology of National Cancer Institute, Cairo University since 2012. she has more than 15 publications in the oncology field especially solid tumors (breast, ovaries and liver).

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