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Increased Cortisol Secretion, Immune Activation and Mood Changes in Breast Cancer Patients Following Surgery and Adjuvant Chemotherapy

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Introduction: Confrontation with cancer is emotionally challenging in patients. Interestingly, depressed metastatic breast cancer patients show blunted cortisol awakening responses and reduced respiratory sinus arrhythmia, reflecting a physiologic profile often associated with chronic stress. These endocrine changes could alter immune defense mechanisms or act directly on tumor metabolism affecting cancer progression.

Objective: Explore the relationship between perceived stress, depression symptoms, neuroendocrine and immune function and cancer progression in breast cancer patients

Aim: Elucidate the mechanisms translating psychosocial conditions and lifestyles into individual risk factors for cancer growth and recurrence, allowing the delivery of biomarkers for disease prevention.

Methods: Cortisol was assessed in the saliva 30 days after surgery and at months 6 and 12 after chemotherapy. On the same days serum Brain-derived Neurotrophic Factor (BDNF) levels, cytokines (TNF- α , IL-1, IL-6), Cytochrome C, estradiol, IGF-1, leptin, adiponectin, anti-estrogen receptors α and β antibodies was measured and psychological tests administered to assess depressive symptoms, coping style and anxiety.

Results: After six months of chemotherapy, patients showed increased levels of depression as well as plasma cortisol and serum chemokine MIP-1b LFA-IV-, which has not only a tumor-promoting role but also is directly related with a poor prognosis. Interestingly, we found cortisol and depression levels grown up at 12 months follow-up.

Conclusions: Preliminary data indicate that psychological factors can affect physiological responses in breast cancer patients. This is especially relevant since stressful events and negative affective states can amplify the consequences of the pathology precipitating disease progression and promoting recurrence.