

About Role of Cytokines in Cancer Comorbidity and Tumorigenesis

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ABSTRACT

Depression and cancer are both leading causes of death and disability worldwide, they often co-occur together, with a consequent heavy socioeconomic burden. It has been hypothesized that immune activation and inflammation play a key role in the pathophysiology of both diseases. Cytokines increase the activity and expression of monoamine reuptake transporters; this lowers synaptic concentrations of monoamines, resulting in depressive disorders. A stress-activated production of pro-inflammatory cytokines alters tryptophan and monoamine metabolism and autoregulatory HPA axis pathways, thus contributing to the development of depression. Tumor cell burden is a clear source of inflammatory substances. Cancer and its treatment could lead to the development of depression by inducing inflammatory activation and responses that send immune signaling to the brain. Such effect stems also from cytokine-related boosting the secretion of CRH. Both somatic and psychological symptoms were increased in cancer patients with major depression, compared to those without this psychological disturbance. There is correlation between serum levels of proinflammatory cytokines and depressive disorders. The latter's association with IL-6 (particularly the somatic symptom domain) is very apparent in the case of pancreatic cancer, when mood disorders can precede tumor diagnosis. Cytokine levels may be used as a marker for the manifestation of depressive disorders in cancer patients; it turned out that their values reduce with physical activity that have well-known antidepressive efficacy. Antidepressants potentially have anti-inflammatory properties and antidepressant response has been associated with reductions in pro-inflammatory cytokines; these suggestions were confirmed with the findings of some researches. Vice versa, anti-inflammatory drugs are more effective than placebo in treating the symptoms of depression. A better understanding of the molecular mechanisms involved in psychological disorders will allow the design of therapeutic interventions that lead to an improved quality of life and overall survival.

Keywords: Cancer, Tumorigenesis, Immune system, Immune privilege, Inflammation, Cytokines, Depression, Tryptophan

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