

# Abstract

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## Trace elements, anxiety and immune parameters in patients affected by cancer.

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**OBJECTIVE:** The aim of this case-control study was to investigate the relationship between trace elements, immune parameters, and human cancer, taking into account some personality traits, such as anxiety, implicated in the modulation of both immune responses and pathology.

**METHODS:** Thirty patients affected by the most frequent cancer types were recruited at the onset of disease together with 30 healthy controls. Se, Zn and Cu were measured in plasma together with glutathione peroxidase (GSH-Px) activity, and lipid peroxidation (thiobarbituric acid-reactive substances--TBARS). Furthermore, Zn and GSH-Px activity were measured in red blood cells. A complete blood profile with the main lymphocytes subsets was obtained and the State-Trait Anxiety Inventory was applied to evaluate anxiety.

**RESULTS:** The only differences found between trace element levels in cases and controls were significantly higher erythrocyte Zn in cancer patients and higher plasma Cu levels in male patients. In addition, subjects affected by cancer exhibited a significant reduction in TBARS levels, were more anxious, had lower total B cells percentage and T helper/T suppressor ratio, and had a higher percentage of natural killer cells. Interestingly, in patients only, GSH-Px in plasma was positively related to trait anxiety scores ( $p < 0.02$ ) and Cu to state anxiety scores ( $p < 0.05$ ).

**CONCLUSION:** In conclusion, we could not confirm the existence of trace element deficiency in relation to cancer and no links between trace element levels and lymphocyte subsets were documented. However, interesting associations between state anxiety and Cu, and between trait anxiety and GSH-Px were observed thus deserving further investigations.

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