Is glutamine deficiency the link between inflammation, malnutrition, and fatigue in cancer patients?


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PURPOSE: Evaluation of potential associations between plasma glutamine levels and the incidence of cancer related fatigue, physical performance, poor nutritional status, and inflammation in patients with solid tumors.

STUDY DESIGN: Mono-center cross-sectional study recruiting 100 (34 women) consecutive patients (September 2009-March 2011; ≥18 y) with solid tumors and causal tumor therapy.

METHODOLOGY: Fasting venous blood was harvested for routine clinical chemistry, amino acid (HPLC) and inflammation marker analyses. Clinical assessments included global, physical, affective and cognitive fatigue (questionnaire) and Karnofsky performance status. Nutritional status was evaluated using bioelectrical impedance analysis, the Prognostic Inflammatory and Nutritional Index and plasma protein levels. Regression analyses were performed to correlate continuous variables with plasma glutamine (95% confidence intervals).

RESULTS: Nutritional status was impaired in 19% of the patients. Average plasma glutamine concentration (574.0 ± 189.6 μmol/L) was within normal range but decreased with impaired physical function. Plasma glutamine was linked to the ratio extracellular to body cell mass (p < 0.044), CRP (p < 0.001), physical (p = 0.014), affective (p = 0.041), and global fatigue (p = 0.030). Markers of inflammation increased with low physical performance.

CONCLUSIONS: The data support our working hypothesis that in cancer patients systemic inflammation maintains a catabolic situation leading to malnutrition symptoms and glutamine deprivation, the latter being associated with cancer related fatigue.

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