

Abstract

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In chronic fatigue syndrome, the decreased levels of omega-3 poly-unsaturated fatty acids are related to lowered serum zinc and defects in T cell activation.

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BACKGROUND: There is now evidence that major depression is accompanied by decreased levels of omega3 poly-unsaturated fatty acids (PUFA), such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). There is a strong comorbidity between major depression and chronic fatigue syndrome (CFS).

OBJECTIVE AND METHODS: The present study has been carried out in order to examine PUFA levels in CFS. In twenty-two CFS patients and 12 normal controls we measured serum PUFA levels using gas chromatography and mass spectrometry.

RESULTS: We found that CFS was accompanied by increased levels of omega6 PUFAs, i.e. linoleic acid and arachidonic acid (AA), and mono-unsaturated fatty acids (MUFAs), i.e. oleic acid. The EPA/AA and total omega3/omega6 ratios were significantly lower in CFS patients than in normal controls. The omega3/omega6 ratio was significantly and negatively correlated to the severity of illness and some items of the FibroFatigue scale, i.e. aches and pain, fatigue and failing memory. The severity of illness was significantly and positively correlated to linoleic and arachidonic acid, oleic acid, omega9 fatty acids and one of the saturated fatty acids, i.e. palmitic acid. **In CFS subjects, we found significant positive correlations between the omega3/omega6 ratio and lowered serum zinc levels** and the lowered mitogen-stimulated CD69 expression on CD3+, CD3+ CD4+, and CD3+ CD8+ T cells, which indicate defects in early T cell activation.

CONCLUSION: **The results of this study show that a decreased availability of omega3 PUFAs plays a role in the pathophysiology of CFS and is related to the immune pathophysiology of CFS. The results suggest that patients with CFS should respond favourably to treatment with--amongst other things--omega3 PUFAs, such as EPA and DHA.**

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