

# Abstract

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## **Chronic fatigue syndrome is accompanied by an IgM-related immune response directed against neopeptides formed by oxidative or nitrosative damage to lipids and proteins.**

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**BACKGROUND:** There is now some evidence that chronic fatigue syndrome (CFS) is accompanied by signs of oxidative stress and by a decreased antioxidant status.

**OBJECTIVE:** The aim of the present study was to examine whether CFS is accompanied by an immune response to neopeptides of a variety of modified lipids and proteins indicating damage caused by oxidative and nitrosative stress.

**METHODS:** Toward this end we examined serum antibodies to fatty acids (oleic, palmitic and myristic acid), by-products of lipid peroxidation, i.e. azelaic acid and malondialdehyde (MDA), acetylcholine, S-farnesyl-L-cysteine, and N-oxide modified amino-acids in 14 patients with CFS, 14 subjects with partial CFS and 11 normal controls.

**RESULTS:** We found that the prevalences and mean values for the serum IgM levels directed against oleic, palmitic and myristic acid, MDA, azelaic acid, S-farnesyl-L-cysteine, and the N-oxide derivatives, nitro-tyrosine, nitro-phenylalanine, nitro-arginine, nitro-tryptophan, and nitro-cysteinyl were significantly greater in CFS patients than in normal controls, whereas patients with partial CFS took up an intermediate position. There were significant and positive correlations between the serum IgM levels directed against fatty acids, MDA and azelaic acid and the above N-oxide-derivates and the severity of illness (as measured by the FibroFatigue scale) and symptoms, such as aches and pain, muscular tension and fatigue.

**CONCLUSION:** The results show that CFS is characterized by an IgM-related immune response directed against disrupted lipid membrane components, by-products of lipid peroxidation, S-farnesyl-L-cysteine, and NO-modified amino-acids, which are normally not detected by the immune system but due to oxidative and nitrosative damage have become immunogenic.

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