Oxidant Stress, Anti-Oxidants and Essential Fatty Acids in Systemic Lupus Erythematosus

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Abstract

Eicosapentaenoic acid and docosahexaenoic acid (EPA and DHA respectively) can suppress the production of interleukin-1 (IL-1), IL-2 and TNF (tumor necrosis factor) but not of IL-4 by human lymphocytes in vitro. In addition, the concentrations of EPA and DHA were also found to be low in the plasma phospholipid fraction of patients with SLE. In a limited clinical study performed by us earlier, it was observed that oral supplementation of EPA/DHA to patients with SLE can induce clinical remission without any side-effects. Since oxygen free radicals are known to be involved in the pathobiology of SLE, we estimated the plasma concentrations of lipid peroxides, nitric oxide, and anti-oxidants such as catalase, superoxide dismutase (SOD), glutathione peroxidase and vitamin E in these patients both before and after the induction of remission following EPA/DHA administration. These results showed that the levels of lipid peroxides are elevated and those of nitric oxide, SOD and glutathione peroxidase are decreased in SLE prior to EPA/DHA supplementation. Following EPA/DHA administration the concentrations of lipid peroxides, and those of nitric oxide, SOD and glutathione peroxidase reverted to near normal levels. These results suggest that oxidant stress, nitric oxide, and anti-oxidants play a significant role in SLE and that EPA/DHA can modulate oxidant stress and nitric oxide synthesis and may have a regulator role in the synthesis of anti-oxidant enzymes such as SOD and glutathione peroxidase. From the results of this study, we would like to suggest that measurement of lipid peroxides, nitric oxide and anti-oxidants can be used as markers to predict prognosis in patients with SLE.

LinkOut – more resources

Medical

Genetic Alliance

MedlinePlus Health Information

Miscellaneous

Hazardous Substances Data Bank