Oxidative Stress and Non-Alcoholic Fatty Liver Disease:

Effects of Omega-3 Fatty Acid Supplementation.

Abstract

Aging is a complex phenomenon characterized by the progressive loss of tissue and organ function. The oxidative-stress theory of aging postulates that age-associated functional losses are due to the accumulation of ROS-induced damage.
Liver function impairment and non-alcoholic fatty liver disease (NAFLD) are common among the elderly. NAFLD can progress to non-alcoholic steatohepatitis (NASH) and evolve to hepatic cirrhosis or hepatic carcinoma.

Oxidative stress, lipotoxicity, and inflammation play a key role in the progression of NAFLD. A growing body of evidence supports the therapeutic potential of omega-3 polyunsaturated fatty acids (n-3 PUFA), mainly docosahaexenoic (DHA) and eicosapentaenoic acid (EPA), on metabolic diseases based on their antioxidant and anti-inflammatory properties. Here, we performed a systematic review of clinical trials analyzing the efficacy of n-3 PUFA on both systemic oxidative stress and on NAFLD/NASH features in adults. As a matter of fact, it remains controversial whether n-3 PUFA are effective to counteract oxidative stress.

On the other hand, data suggest that n-3 PUFA supplementation may be effective in the early stages of NAFLD, but not in patients with more severe NAFLD or NASH. Future perspectives and relevant aspects that should be considered when planning new randomized controlled trials are also discussed.

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