DHA, EPA and antioxidants for multiple sclerosis: where we stand

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Multiple sclerosis (MS) is a potentially disabling autoimmune disease of the brain and spinal cord (central nervous system). It attacks the myelin sheaths insulating the axons of the central nervous system, thereby impeding neural signaling. This damage was initially thought to be solely caused by the adaptive immune system's T cells; recent scientific data shed light to the major role B cells play in this destructive process.

Multiple sclerosis usually begins in its relapsing-remitting form in early to mid-adult life with periodic attacks of neurological dysfunction followed by stabilization and often, early in the disease, partial or complete recovery. Over time, the relapsing form may transition to secondary progressive MS, exhibiting worsening symptoms, with about 2% to 3% of people with relapsing MS converting to secondary progressive MS annually without treatment. Under treatment, there is incomplete but increasingly convincing data that the long-term course of MS has been favorably modified and that the transition from relapsing to progressive MS has been decreased perhaps to about 1% a year. Treatment typically focuses on speeding recovery from attacks (abortive therapies), slowing the progression of the disease (preventive therapies) and managing MS symptoms (symptomatic therapies).

Due to the partial effectiveness of the currently available conventional treatments and their side effects, most patients with MS use complementary or alternative therapies. The most common dietary interventions used by MS patients are supplementation with polyunsaturated fatty acids (PUFA), allergen-free (gluten and milk) diets, and vitamins. Preclinical data show that polyunsaturated fatty acids, including omega-3 and omega-6 fatty acids, ameliorated experimental autoimmune encephalomyelitis in association with decreased IFN-γ, IL-17, inflammatory leukocyte activity, and matrix metalloproteinase activity, and with induction of regulatory T cells. A number of observational studies and randomized clinical trials have been conducted attempting to define and establish the potential role of polyunsaturated fatty acids as a treatment modality in the management of multiple sclerosis. The accumulated different design strategies, studied populations, assessed exposures/interventions and outcomes and varying follow-up periods pose challenges in the assessment of this evolving evidence base and hinder its translational potential.