Omega-3 Fatty Acid and Epilepsy

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A recent, small study suggests EPA could reduce seizure activity in people with epilepsy

Reference

Yuen AWC, Flugel D, Poepel A, Bell GS, Peacock JL, Sander JW. Non-randomized open trial of eicosapentaenoic acid (EPA), an omega-3 fatty acid, in ten people with chronic epilepsy. *Epilepsy Behav*. 2012:23;370-372.

Design

Non-randomized, open trial

Participants

10 epilepsy patients (5 male, 5 female), between the ages of 23 and 75 years.

Study Parameters

Patients had experienced at least 2 refractory focal seizures per month in the 3 months prior to the study and were on between 1 and 4 antiepileptic drugs (AEDs). Patients were excluded if their diet included oily fish (>1 meal/week) or omega-3 fatty acid supplements. Patients were administered 1,000 mg of EPA daily for 12 weeks, in concurrence with their existing AED treatment, and recorded seizure activity throughout the study. Self-reported seizure activity (incidence, duration, and severity) was evaluated throughout the 3-month study period and compared to the seizure activity during the 3 months before the study.

Key Findings

Six patients recorded a reduction of seizures in response to EPA supplementation (12–59% when compared to baseline). One patient experienced reduced severity and shortened duration, in spite of a reported increase in seizure incidence. Overall, subjects experienced a non-significant 16% reduction in total seizure activity, compared to baseline.

Clinical Implications

Essential fatty acids play a well-described role in central nervous system development and function,[1] and omega-3 and omega-6 polyunsaturated fatty acids (PUFAs) are gaining attention in studies of central nervous system disorders including Alzheimer's disease, affective disorders, schizophrenia, and cognitive decline.[2–6] In these studies, supplementation with different fractions of EPA and decosahexaenoioc acid (DHA) have demonstrated differential effects. Though the mechanism is unknown, it has been proposed that any neuroprotective effects attributed to long-chain PUFAs may be due to their anti-inflammatory effects.[7]

Animal studies of EPA and DHA supplementation in models of epilepsy have suggested positive effects.[8,9] Human studies, however, are sparse, the sample sizes are typically small (as in the current study), and the results are inconsistent. In a randomized, placebo-controlled study by Yuen and colleagues, a mixture of 1 g EPA and 0.7 g DHA showed at least a 50% decrease in seizure activity in some subjects; however, this decrease was not sustained past 6 weeks.[10] Another study in which PUFAs were consumed in a dietary

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spread (18% EPA, 46% DHA, and 1% α-linolenic acid), in conjunction with vitamin E, yielded a substantial decrease in seizure activity in all patients, but the sample size was small and all patients experienced epilepsy secondary to mental retardation or other CNS disorders.[11]

Thus, the current body of human data on this topic indicates a need for larger clinical studies with a longer duration of use, as well as an examination of differing EPA and DHA ratios and doses. Though the results in the present study did not reach significance, the slight reduction in seizure activity observed, in combination with the limited data already available in animals and humans, provides the justification for a larger, controlled study to further examine the potential neuroprotective role of EPA, alone or in combination with DHA, in epilepsy.

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