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Cognitive and physiological effects of Omega-3 polyunsaturated fatty acid supplementation in healthy subjects.

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Abstract

BACKGROUND: It has been reported that Omega-3 fatty acids may play a role in nervous system activity and that they improve cognitive development and reference memory-related learning, increase neuroplasticity of nerve membranes, contribute to synaptogenesis and are involved in synaptic transmission. The aim of this study was to examine the effects of Omega-3 supplementation on some cognitive and physiological parameters in healthy subjects.

MATERIALS AND METHODS: Subjects were tested at the beginning of the experiment and after 35 days. In this period they were supplemented with Omega-3 polyunsaturated fatty acids. A group was supplemented with olive oil (placebo). Tests involving different types of attention were used, i.e. Alert, Go/No-Go, Choice and Sustained Attention. For each test, the reaction time, the event-related potentials by electroencephalogram (EEG) and the electromyography (EMG) of the forefinger flexor muscle were recorded. The Profile of Mood States test (POMS) was also administered.

RESULTS: Blood analyses showed that after Omega-3 supplementation the arachidonic acid/eicosapentaenoic acid ratio (AA/EPA) was strongly reduced.

The mood profile was improved after Omega-3 with increased vigour and reduced anger, anxiety and depression states. This was associated with an effect on reactivity with a reduction of reaction time in the Go/No-Go and Sustained Attention tests. The latency of EMG activation was concomitantly reduced in the same tests plus Choice. An EEG frequency shift towards the theta and alpha band were recorded in all the tests after Omega-3.

CONCLUSIONS: Omega-3 supplementation is associated with an improvement of attentional and physiological functions, particularly those involving complex cortical processing. These findings are discussed in terms of the influence of Omega-3 on the central nervous system.

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MeSH terms, Substances

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