Bipolar disorder, formerly known as manic-depression, continues to be a perplexing condition for psychiatrists. In bipolar disorder, patients may "cycle" between periods of profound depression and periods of elation and excessive activity (mania). But some cycle rapidly, and others more slowly, while some patients who meet criteria for the conditions have little or no manic component at all.

As with depression, cell membrane deficiencies in omega-3s are associated with bipolar disorder, and people with higher seafood intakes appear to be relatively protected against bipolar symptoms. An autopsy study of the brains of people with bipolar disorder revealed significant deficits in DHA content of brain cell membranes, with concomitant elevations of inflammatory products that would have been suppressed by normal levels of omega-3s.

Omega-3 fatty acids are showing encouraging results in treating some patients with bipolar disorder. In one study, patients supplemented with 9,600 mg omega-3 fatty acids daily showed significantly longer periods of remission than did placebo recipients, and the treatment was well-tolerated. A study using MRI scanning revealed profoundly favorable cell membrane alterations in brain tissue induced by very high dose omega-3 supplementation (approximately 9,700 mg daily). In general omega-3s appear to be more successful at managing the depressive phases of bipolar disorder than the manic phases, a feature they share with many prescription medications. Several small studies demonstrated that supplementation could also reduce the frequency of manic episodes. One dramatic example is a 2009 study of children with bipolar disorder, in which both manic and depressive symptoms were significantly mitigated by combined DHA (1,560 mg daily) and EPA (360 mg daily) supplementation for 6 weeks, according to clinician ratings as well as parent ratings.

Most studies showing the greatest effectiveness in bipolar disorder involve combinations of DHA and EPA. And as we saw with depression, higher daily doses, on the order of 1,000-1,500 mg of DHA and up to 2,000-3,000 mg of EPA, are optimal for bipolar management.

**COGNITIVE DECLINE AND ALZHEIMER’S DISEASE**

Omega-3 intake is strongly associated with many different measures of cognition and memory in numerous epidemiological studies, and there’s compelling evidence for potent neuroprotection over long time periods. Insufficient omega-3 intake is strongly correlated with diminished adaptability of brain synapses and impaired learning and memory. People with lower omega-3 levels may be more likely to suffer from a host of cognitive impairments including dyslexia, ADHD, and cognitive decline.

Laboratory and animal studies shed light on these observations, suggesting that omega-3 treatment and supplementation may enhance brain function through increased production of the membrane-rich neurites required for new synapse formation. Other protective and cognition-enhancing effects include improved neuronal cell membrane characteristics resulting in enhanced neurotransmission, increased synaptic release of vital neurotransmitters such as serotonin, and neuroprotection from inflammation and oxidant-related damage including those induced by antipsychotic medications. DHA is also protective against several risk factors for dementia including head trauma, diabetes, and cardiovascular disease.
In healthy adults, increased omega-3 intake is positively associated with greater brain volume in regions associated with emotional arousal and regulation of behavior. People who get more omega-3s have bigger, more functional brains. A 2009 study found that omega-3-supplemented adults made fewer risk-averse decisions, but did not show increased impulsiveness.

In other words, the omega-3 group appeared better able to take appropriate risks in problem-solving, without dangerous impulsivity—skills that are especially relevant in people with depression, who often withdraw and become fearful of even everyday risk taking.

Alzheimer’s disease remains one of the most intransigent of age-related neuropathologies. Oxidative damage and inflammation underlie the progressive loss of memory and disorientation that typify the disease, resulting in the term “inflammaging” to describe the complex events that lead to clinically important symptoms. Omega-3s have been shown to favorably alter some of the characteristic changes associated with the disease.

DHA (1,700 mg daily combined with 600 mg EPA) in Alzheimer’s patients significantly reduced levels of inflammatory cytokines circulating in their blood, suggesting that some of the brain tissue inflammation might be mitigated. Omega-3 supplementation, again with 1,700 mg DHA and 600 mg EPA, in Alzheimer’s patients with mild-to-moderate disease improved appetite and produced significant beneficial increases in body weight after 6 and 12 months of treatment, while placebo patients showed no change in weight. These findings have led to calls by experts for increased use of omega-3s as a preventive strategy—calls made all the more urgent by the observation that supplementation is most effective in slowing or reversing mild Alzheimer’s disease and early age-related cognitive decline.

The molecular basis for this early intervention strategy lies in the cellular pathology at the core of Alzheimer’s: omega-3 treatment of cultured brain cells suppresses many of the early signs of damage triggered by the inflammatory Alzheimer’s protein known as beta-amyloid. Animal studies suggest that oral supplementation with DHA may enhance the formation of new synapses and increase the production of vital neurotransmitters and dentritic spines, all of which can improve cognitive function. In fact, learning and memory in animal models of Alzheimer’s are improved by DHA supplementation, and in humans fewer learning errors were made by people with age-related cognitive decline after six months on DHA (900 mg daily).

SUMMARY

An estimated 8% of brain matter is composed of omega-3s. Omega-3 fatty acids exert profound anti-aging effects on brain structure and function, from cognition and memory to mental health and Alzheimer’s prevention. They have recently been associated with increased volume of the brain’s gray matter, especially in those regions associated with happiness, and they also boost intelligence through enhanced function from birth onwards. They support brain cell structure, increase the production of vital neurotransmitters and blunt oxidative and inflammatory damage. Ranges of 1,000-3,000 mg of EPA and 1,000-1,500 mg of DHA have been shown to yield significant improvements in symptoms of depression, aggression, and other mental disorders, as well as protection against early cognitive decline and even early Alzheimer’s disease.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

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