

Study points to cocktail therapy for Alzheimer's

July 8 2008

A dietary cocktail that includes a type of omega-3 fatty acid can improve memory and learning in gerbils, according to the latest study from MIT researchers that points to a possible beverage-based treatment for Alzheimer's and other brain diseases.

The combination of supplements, which contains three compounds normally found in the bloodstream, is now being tested in Alzheimer's patients. The cocktail has previously been shown to promote growth of new brain connections in rodents.

"It may be possible to use this treatment to partially restore brain function in people with diseases that decrease the number of brain neurons, including, for example, Alzheimer's disease, Parkinson's, strokes and brain injuries. Of course, such speculations have to be tested in double-blind, placebo-controlled clinical trials," said Richard Wurtman, Cecil H. Green Distinguished Professor of Neuropharmacology and senior author of a paper on the new work.

Such trials are now underway in Europe. A paper describing preliminary results has been submitted to the Alzheimer's Association International Conference on Alzheimer's Disease, to be held in Chicago July 26-31.

The new findings in gerbils appeared in the July 7 online edition of the *Journal of FASEB* (Federation of American Societies of Experimental Biology).

The researchers found that normal gerbils treated with the mixture—a combination of DHA (a type of omega-3 fatty acid), uridine and choline—performed significantly better on learning and memory tests than untreated gerbils.

Wurtman developed the treatment as a new approach to tackling Alzheimer's—restoring the synapses, or connections between brain cells, that leads to cognitive decline in Alzheimer's patients.

Synapses, where information is passed between neurons, play a critical role in learning and memory. Wurtman's laboratory has previously shown that the cocktail treatment improves those functions in rats with cognitive impairments.

The three dietary supplements under investigation are precursors to the fatty molecules that make up cell membranes, including the membranes of brain cells, which form synapses.

In the FASEB study, Wurtman and his colleagues found that gerbils that received all three supplements had up to 70 percent more phosphatides (a type of molecule that forms cell membranes) than control mice, suggesting that new synapses are forming.

"The improvements in cognition observed in normal gerbils in this study and in rats with impaired cognition, in a previous study, correlate perfectly with the evidence of increased brain synapses, as shown biochemically and anatomically," said Wurtman. "This suggests that treating the animals with the experimental mixture affects behavior by increasing the number of synapses in important brain regions.

Some of the gerbils in the studies received all three compounds and some received only two. The improvements in apparent synapse growth and cognitive ability were greatest in the rats given all three.

Omega-3 fatty acids are not produced in the body but are found in a variety of sources, including fish, eggs, flaxseed and meat from grass-fed animals. Choline can be synthesized in the body and obtained through the diet; it is found in meats, nuts and eggs. Uridine cannot be obtained from food sources, but is a component of human breast milk and can be produced in the body.

Source: Massachusetts Institute of Technology

Citation: Study points to cocktail therapy for Alzheimer's (2008, July 8) retrieved 23 April 2024 from <https://medicalxpress.com/news/2008-07-cocktail-therapy-alzheimer.html>

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