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ANXIETY, INFLAMMATION AND OMEGA-3 FATTY ACIDS

Earlier studies have shown that low levels of omega-3 fatty acids may be linked to both depression and to inflammation. A double-blind study appeared in *Brain Behavior, and Immunity* (epublished ahead of print July 19, 2011 doi:10.1016/j.bbi.2011.07.229); it looked at omega-3 fatty acid consumption, its effect on the production of inflammatory chemicals known as cytokines and its effect on depression. The subjects of the 12 week study were 68 medical students who were given either a placebo or an omega-3 fatty acid supplement containing EPA (2085 mg/day) and DHA (348 mg/day). Blood samples were taken regularly during periods of low stress as well as on days before an exam (high-stress). The students who received the omega-3 supplement produced lower levels of the chemicals associated with inflammation. Compared to controls, those students who received the omega-3 supplement had a 14% decrease in lipopolysaccharide (LPS) stimulated interleukin 6 (IL-6) production (a chemical that indicates the presence of inflammation) and a 20% reduction in anxiety symptoms.

Because people vary in their ability to absorb essential fatty acids, blood tests were performed to look at the ratio between omega-3 and omega-6 fatty acids in the blood. A higher ratio of omega-3 to omega-6 fatty acids was associated with a decrease in tumor necrosis factor alpha, another chemical that indicates the presence of inflammation.

The authors concluded, "The reduction in anxiety symptoms associated with omega-3 supplementation provides the first evidence that omega-3 may have potential anxiolytic benefits for individuals without an anxiety disorder diagnosis."

D-RIBOSE AND HEART FAILURE

D-ribose is a naturally occurring five-carbon sugar found in all living cells. Though not an essential nutrient since it can be made in the body from other substances such as glucose, D-ribose is, however, very essential for life. Some of the most important biological molecules contain D-ribose, including ATP (adenosine triphosphate), all the nucleotides and nucleotide coenzymes and all forms of RNA (ribonucleic acid). D-ribose in RNA and deoxyribose in DNA may be considered genetic sugars. Since D-ribose is ubiquitous in living matter, it is ingested in our diets. Supplementally, it enhances ATP production significantly when additional support is needed.

One possible way to address congestive heart failure is to improve the production of energy in the heart muscle cells. In heart failure, the heart is literally energy starved. Ribose is a five carbon sugar that is part of the ATP molecule (adenosine triphosphate). Taking ribose may be a way to increase the energy production of the heart cells, according to an article in *Progressive Cardiovascular Nursing* (2009 Jun;24(2):59-60).

Animal studies have shown the value of D-ribose to heart function. A study that appeared in Science (1983 Apr 1;220(4592):81-2) along with another study, that appeared in *Cell Physiology and Biochemistry* (2009;24(3-4):211-8. Epub 2009 Aug 3) found that rats who were given an IV infusion of d-ribose (200 mg/kg/h) one day prior to the induction of a myocardial infarction, had a smaller area of infarction and better left ventricle function, when compared to animals in the control group. Another study on rats that appeared in *Progressive Cardiovascular Nursing* (2009 Jun;24(2):59-60) found that ribose normalized depressed heart function in rats.

There have been some small clinical trials; research that appeared in the *European Journal of Heart Failure* (2003 Oct;5(5):615-9) found that ribose supplementation improved ischemic threshold and enhanced diastolic function in congestive heart failure. The small study showed improvement to patients' quality of life and improvement of cardiac function with ribose supplementation. Another small study that was published in the *International Journal of Cardiology* (2009 Sep 11;137(1):79-80. Epub 2008 Jul 31) looked at 16 patients with class III or class IV heart failure. They were given five grams of ribose three times each day. At the end of eight weeks, all patients had a significant improvement in ventilatory parameters at anaerobic threshold, along with a 44% Weber class improvement. Ribose improved the ventilatory exercise status in advanced heart failure patients.

D-ribose is a simple, inexpensive treatment with few (if any) side-effects. Considering that standard medical care for patients with heart failure is not extremely successful, it may be worth trying.

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ECZEMA AND PROBIOTICS

Atopic eczema is due to a hypersensitivity reaction (similar to an allergy) in the skin, which leads to long-term inflammation of the skin. It is most common in infants. People with eczema often have asthma or hay fever, too, and there is often a family history of allergic conditions such as asthma, hay fever, or eczema. A meta-analysis or review of published randomized, double-blind, placebo-controlled studies was published in the *British Journal of Nutrition* (Epublished ahead of print July 26, 2011). It found that maternal supplementation with probiotics during pregnancy tended to prevent atopic eczema in children between the ages of two and seven.

PREVENTING ALZHEIMER'S DISEASE

Research that was presented at the Alzheimer's International Conference on July 19, 2011 in Paris shows that even a moderate reduction in the risk factors for Alzheimer's disease could prevent millions of cases worldwide. Common risk factors for the disease include obesity, smoking, high blood pressure, depression, inactivity, diabetes and low education. The researchers determined that these risk factors were responsible for about 17 million cases of Alzheimer's disease worldwide. (Published online in *The Lancet Neurology* (epublished 7/19/11).

Epidemiologic analysis of the links between Alzheimer's disease and key risk factors found that 21% of all cases in the United States are linked to a sedentary lifestyle. Depression is linked to 15% of the cases. Smoking is linked to 11% of the cases. Mid life obesity accounts for 8% of the cases and mid-life hypertension accounts for 7% of the cases.

A second study that was presented at the conference found that people with the ability to cope, keep positive and ask for help, skills that were called "resilient cognition" by the researchers, were less likely to develop Alzheimer's disease. Poor coping skills were linked to an increased incidence of Alzheimer's disease. People who were neglected as children or who scored poorly on tests for gauging suicidal thoughts had a tendency for poor cognitive performance.

Research appearing in the March, 2005 issue of the journal *Cell* showed that mice kept in a stimulating environment were less likely to develop Alzheimer's disease than mice kept in an environment that is low in stimulation. Mice that had access to toys, running wheels, tunnels and other activities to keep mind and body active had a lower instance of the protein plaques associated with Alzheimer's disease.

The mice in the study were genetically predisposed to developing the protein plaques in the brain that characterizes Alzheimer's disease. Mice that were physically and mentally active had less of a tendency to develop the disease. Perhaps there is a lesson here for humans—keep active and avoid brain deterioration.

Research appearing in the *Journal of Neuroscience* (December 26, 2007, Vol 27, Issue 52, pp 14299-14307) shows that DHA (an omega-3 fatty acid) can increase the production of a protein that helps to block enzymes that are responsible for producing the plaques found in Alzheimer's disease. The research, found that DHA increases a protein, called LR11, in rat neurons. LR11 inhibits amyloid precursor protein (APP), which is involved with the production of the plaques associated with Alzheimer's disease.

"God is subtle but he is not malicious."

Albert Einstein

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PREVENT ALZHEIMER'S DISEASE WITH VEGGIES

Research appearing in the *Journal of Food Science* (24 January, 2008, e-published ahead of print), shows that fruit rich in polyphenols may protect against Alzheimer's disease. Polyphenols are natural compounds found in plant foods. They act as antioxidants and provide other health benefits. Green tea polyphenols and polyphenols from wine have attracted a great deal of media attention. While dietary anti-oxidants, such as vitamins E and C, have received considerable attention, relatively little is known about a similar anti-oxidant role for plant-derived polyphenols, such as the flavonoids and phenolic acids.

In one study, polyphenol extracts were able to suppress cell destruction. The researchers used neuron-like PC12 cells and exposed them to fruit extracts at different concentrations (100, 300, 600, 2,000 mcg/ml) before treating them with hydrogen peroxide. More cells survived when treated with the fruit extracts.

Vegetables are also high in folic acid; the word "folic' comes from the word "foliage". Adequate folic acid levels may protect from dementia. The most common form of dementia is Alzheimer's disease, affecting about 13 million people worldwide. By mid century the prevalence of Alzheimer's disease is expected to quadruple.

A study appearing in the *Journal of Neurology, Neurosurgery and Psychiatry (*Published online ahead of print, doi 10.1136/jnnp.2007) found a connection between folic acid levels and the tendency for dementia. Researchers followed 518 elderly individuals (average age 73) for a 2.4 year period. At the beginning of the study, none of the subjects had dementia. The researchers noted that the development of dementia was much more likely in those subject with low folate levels and high homocysteine levels.