



Folate and Reduced Risk of Alzheimer's Disease

Alzheimer's Disease in America

Alzheimer's disease, the most common form of mental disease, is affecting over 13 million people around the world, and is expected to quadruple by the year 2047. In the United States alone the cost of care, both directly and indirectly, is over \$100 billion dollars. And then there is the daily emotional stress and strain to the care giver(s).

New research published in the January 2007 issue of *Archives of Neurology* by researcher Jose Luchsinger of Columbia University Medical Center, revealed that an increased intake of folic acid from both food and supplements may reduce the risk of Alzheimer's disease by 50%.

Study Protocol

The conclusion of the reduced risk of Alzheimer's disease from folate was based on a six year study where the diets of 965 people with the average age of 75.8 years were analyzed. The people involved were comprised of 70.2% women, 45.3% Hispanic, 32.6% African American, and 22.1% Caucasian. Most of the analysis of the diets were completed in or before 1996, which was before the mandatory enrichment of grain and cereal products with the synthetic form of folate known as folic acid. It wasn't until 1998 that folate enrichment of food was legislated based on research that a folate deficiency during pregnancy increased the risk of neural tube defects. This synthetic form is also widely used in supplements.

Study Results

After nearly six years of continuous analysis there were 192 people out of 965 diagnosed with Alzheimer's disease. When the researchers had adjusted for other contributing factors such as their age, cardiovascular history, and intake of B12 and B6, they discovered that when the folate level was increased from both diet and supplements, there was a link to a reduced risk of Alzheimer's disease by 50%. The researchers also found that this link to a reduced risk was only associated to the combination of diet and supplementation and not to either one alone. Also, the amount of B12 and B6 had no link to the reduced risk of Alzheimer's disease.

Abnormalities of the Brains of Alzheimer's Disease

Examination of the brains of Alzheimer's victims at autopsy reveals three distinct abnormalities, (1) a large loss of neurons in specific areas of the brain, (2) tangled protein filaments within neurons, and (3) an accumulation of abnormal amyloid plaques deposited outside of neurons. Also, some even have elevated levels of aluminum in the brain which has no known use.

Alzheimer's disease patients have a severe loss of neurons in the areas of the hippocampus and cerebral cortex that are critical for memory and learning. But besides the loss of neurons there is the degenerating of the axons, axon terminals, and fibrils by the accumulation of amyloid plaques by an abnormal protein called beta amyloid.

Homocysteine's Possible Effects On Amyloid Plaques for Increased Risk of Alzheimer's

Researchers have found a link between the level of homocysteine and the degree of accumulation of amyloid proteins in the brain. When there is a combination of low folate and high homocysteine levels amyloid beta's effects may be enhanced increasing the risk of Alzheimer's disease.

Folate and Healthier Homocysteine Levels

The higher amounts of folate in the study from the combination of food and supplements correlated to a lower level of homocysteine. This in turn suggests that a higher level of folate would result in a lowered risk of Alzheimer's disease.

Advantages of Bioactive Folate Compared to Folic Acid

The form of folate that was added in 1998 to the grains and cereals because of dietary folate deficiencies was folic acid, a synthetic oxidized folate not normally found in plants and animals. It is not bioactive, ready to be used by the body, and is also the most commonly used form in vitamin supplements. This synthetic form of folate must be converted to tetrahydrofolate by the intestines and the liver before the body can use it for essential folate-dependent metabolic reactions.

Folic Acid Deficiency is Very Common

Even though folic acid occurs widely in food it is the most common deficiency in the world. This is due in part to eating too many processed foods, and failure to eat enough of the natural unprocessed whole plant foods, that contain folic acid. Some natural whole food sources where folic acid is found in high concentrations are green leafy vegetables such as kale, spinach, beet greens, and chard. Some other food sources include whole grains, root vegetables, cabbage, broccoli, cauliflower, avocados, oranges, asparagus, legumes, sesame seeds, and nuts such as filberts, hazelnuts, cashews, walnuts, and almonds. Folic acid is very sensitive and destroyed easily by light and heat so it is important to eat foods high in folic acid with as little cooking as possible, including micro waving.¹

People Are Not Converting Synthetic Folic Acid Into the Bioactive Form

Because of this worldwide deficiency of folic acid grains and cereals have been fortified with synthetic folic acid as mentioned earlier since 1998. Many people also take supplements, such as a multiple, for insurance against any possible shortage of a vitamin or mineral, which in this case would be folic acid. However, what people don't realize is that this synthetic form of folic acid added to food and put into supplements is not being effectively absorbed and converted into the bioactive form for use by the body. Factors contributing to the poor absorption and conversion process and interference to its activity are mineral and enzyme deficiencies, poor bowel and liver health, bowel and liver disease, processed and cooked food, chlorine and sodium fluoride, alcohol, smoking, and medications such as NSAIDs and antibiotics, oral contraceptives, aspirin, levodopa/carbidopa (Sinemet®), and other drugs that interfere with folate activity such as estrogens, methotrexate, sulfasalazine, and trimethoprim, anti-seizure agents, and barbiturates.

Unconverted Folic Acid Cannot Be Used

Unmetabolized folic acid entering the blood stream and taken up by cells cannot be used by the body and prevents folate-dependent chemical reactions involving DNA and RNA increasing the risk of genetic mutations within cells. Many people do not have the ability to make bioactive folates, especially L-5-methyltetrahydrofolate (L-5-MTHF) because of gene mutations. Around 25% of the population have a genetic variant for an enzyme required to make L-5-methyltetrahydrofolate and are especially susceptible to a deficiency of folate putting them at higher risk for birth defects and cancer. And as brought out in the study above insufficient levels of bioactive folate contributes to higher levels of homocysteine that also damages the inner linings of blood vessels, increases abnormal clotting time, oxidizes LDL cholesterol making it more prone to blocking the arteries, and promotes inflammation adversely affecting the health of the cardiovascular, neurological, skeletal, endocrine, and digestive systems.

Superior Patented Supplemental Form of Bioactive Folic Acid

To insure that the proper level of folic acid is available in a bioactive form you should take a supplement that contains it. Unfortunately, not many vitamin supplements have the bioactive forms. Most use only the synthetic form of folic acid. If you cannot find a multiple containing the bioactive form of folic acid you can examine Live Well Naturally's [MultiFuel™ Vitamin/Mineral Formula](#). MultiFuel™ contains a 50/50 mixture of 800 mcg of two bioactive forms of folic acid, folinic acid and L-5-methyltetrahydrofolate (L-5-MTHF).

Patented Form of Bioactive Folate

The L-5-methyltetrahydrofolate (L-5-MTHF) is a form providing a stable, pure, crystalline L-5-MTHF monoglutamate. It requires no conversion to be absorbed in the small intestine unlike synthetic folic acid which must first be reduced to tetrahydrofolate (THF) and then be joined with either a methyl or formyl group in the intestinal lining. Because this reduction process is quickly exhausted those taking more than 400 mcg daily will have high levels of metabolically inactive folic acid in the blood and urine. Most natural occurring folates are either mono or polyglutated derivatives of L-5-MTHF and are converted and absorbed by the small intestinal lining as L-5-MTHF.

The most common form of folate circulating in the blood is L-5-MTHF and is transported to the liver, brain, and other body tissues. It is the only form that crosses the blood brain barrier along with other folates being essential for normal brain development, growth, and function. The active form of L-5-MTHF polyglutamate is part of the methylation cycle supplying the methyl group needed for the conversion of the toxic amino acid homocysteine to the metabolically crucial amino acid, methionine.

L-5-MTHF Reduces Risk of Masking a B12 Deficiency.

One of the results of a B12 deficiency is reduced red blood cell production and anemia. Synthetic folic acid can mask a B12 deficiency because it can reverse anemia but cannot prevent or reverse the neurological symptoms of a B12 deficiency which could result in nerve damage. However, folate in the bioactive form of L-5-MTHF must first be converted to tetrahydrofolate in a B12 dependent reaction before it can be used by the body in other folate-mediated reactions which includes red blood cell production. As a result this makes the bioactive form L-5-MTHF less likely to mask a B12 deficiency and more appropriate to use than the synthetic form of folic acid as a supplement.

MultiFuel™ Vitamin/Mineral Formula Iron Free

As the article brought out it is important to supplement with a bioactive form of folate. If you look at your multiple and others in the stores you will have to look hard and long to find a multiple that contains the bioactive form of folate. While I sell supplements I never try to use my newsletters to push my supplements on people. People sign up for the newsletter to read about information that can help them to stay healthy, and improve their health and quality of life. But from time to time I may have to mention one of my supplements. In this case it is MultiFuel™ a multiple that contains high quality vitamins, minerals, and antioxidants, and two bioactive forms of folate, L-5-methyltetrahydrofolate, and folinic acid.

B12 Works with Folate to Maintain Healthy Homocysteine Levels

It is just as important to supplement with the bioactive form of B12 as it too is very difficult to convert and absorb in the synthetic form, cyanocobalamin. However, MultiFuel™ contains not only one bioactive form of B12 but two, methylcobalamin and S-adenosylcobalamin. And if you look at your multiple it most likely is the synthetic B12, cyanocobalamin. While some multiples may contain the bioactive form of methylcobalamin, although there aren't many, you will be hard pressed to find any that contain S-adenosylcobalamin. To demonstrate the importance of B12 and folate in the control of homocysteine one study showed that even when the level of homocysteine was within normal values the addition of the combination of B12 and folate brought their levels down even more.²

Bioactive Forms of B12 and Folate For Increased Absorption and Effectiveness

As you will recall in the article an elevated level of homocysteine has a strong link as a contributing factor to Alzheimer's disease, as well as to other diseases such as cardiovascular, neurological, skeletal, endocrine, and digestive. B12 works with folate in the metabolic processes of converting the toxic homocysteine into the usable amino acid methionine, reducing the risks of these diseases. That being the case it would be of great benefit to supplement with the bioactive forms for increased absorption and effectiveness.

References:

Source of Study: *Archives of Neurology*

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