

[IMAGE]

Brain Vitamins

By Dr. James Meschino

Can certain vitamins help your brain, particularly when it comes to maintaining cognitive function and warding off Alzheimer's and other brain-related disorders as we age? Look no further than the B vitamins, three of which may do just that, according to a growing body of research.

The B vitamins are eight water-soluble vitamins that were once considered a single vitamin, but are actually chemically distinct nutrients that tend to be present in similar foods, including meat, eggs, dairy products, green vegetables and whole grains. As a group, they are responsible for several important functions, including supporting metabolism, enhancing immune and nervous system function, maintaining healthy skin and muscle tone, and promoting cell growth and division.

Three of the B vitamins have also been linked to brain health. The results of several research studies suggest that consuming adequate amounts of vitamin B₆, vitamin B₉ and vitamin B₁₂ throughout one's lifetime may play a key role in reducing the risk of developing Alzheimer's disease and other types of dementia as we age. This evidence was strengthened by a study that found patients with Alzheimer's disease had higher blood levels of *homocysteine* (an amino acid in the blood) than members of the age-matched control group who were not afflicted with Alzheimer's disease. Individuals with higher blood levels of homocysteine were several times more likely to have Alzheimer's disease than those with lower blood homocysteine levels. And what is the strongest determinant of blood homocysteine levels, unless there is an overriding genetic defect of some major consequence? The nutritional status of folic acid, vitamin B₆ and vitamin B₁₂.

Brain - Copyright â Stock Photo / Register Mark These same B vitamins are also involved in the synthesis of important neurotransmitters that are required for cognitive function and other brain functions. Currently, the average intake of folic acid is only about half of the 400 micrograms experts indicate should be the daily recommended intake level for otherwise healthy individuals. Additionally, a significant number of individuals over the age of 60 don't absorb vitamin B₁₂ efficiently from food sources due to changes in their digestive tract. Many authorities encourage consumers to ingest more dark-green vegetables, beans and fortified grains to acquire folic acid and fortified cereals to help acquire additional vitamin B₁₂. Taking a

daily multiple vitamin and mineral is another way to ensure you achieve a more optimal intake of these B vitamins. This may be a simple but important measure to prevent changes in brain function related to the development of Alzheimer's disease and dementia.

Preventing Age-Related Mental Decline

The notion that deterioration in mental capacities is a natural part of the aging process has been challenged by the findings of a number of research studies that indicate vitamin and mineral status may be significant factors in modifying a person's risk of developing Alzheimer's disease and other types of cognitive impairment and dementia. One study found that older individuals with low blood concentrations of vitamins B₆, B₉ and B₁₂ had the poorest scores of brain function, as measured by a battery of cognitive tests, of all study participants.

Other studies have implicated clinical deficiencies of B vitamins in brain-related disorders, including reversible dementia (vitamin B₁₂ and possibly folate), depression (folate) and electrophysiological dysfunction, including convulsions (vitamin B₆). In healthy older adults, blood levels of B vitamins usually considered to be in the normal range were associated with poorer scores on tests of delayed recall, abstract reasoning and selective attention.

There is also good evidence that deficiencies of these three B vitamins increase with age and are common in older adults. Thus, there is growing support for the premise that optimal B vitamin status can prevent, slow or reverse the deterioration in memory and other mental capacities important to quality-of-life issues in older individuals.

The Normative Aging Study, involving 70 male subjects, ages 54 to 81, revealed that blood levels of vitamin B₉ and B₁₂ appear to be related to cognitive performance in a different way than vitamin B₆. Low blood levels of these two vitamins were associated with deficits in spatial copying. Higher blood levels of vitamin B₆ were associated with better performance on two tests of memory. Another interesting finding was that nearly one-half of the subjects in the study had low blood levels of vitamin B₆.

Brain Pulses - Copyright © Stock Photo / Register Mark This study is extremely important because B vitamins are known to participate in brain chemistry and physiology. Vitamins B₁₂ and folic acid are required as co-enzymes in the synthesis of the neurotransmitters, serotonin catecholamines (adrenaline,

norepinephrine). They are also required for the production of S-adenosylmethionine, which has antidepressant properties. Vitamin B₁₂ deficiency may also result in de-insulation of nerve fibers (demyelination), which produces a number of neurological symptoms. Vitamin B₆ is a co-factor in the production of other brain chemicals (neurotransmitters) including dopamine, norepinephrine, serotonin, gamma-aminobutyric acid (GABA) and taurine.

Pulses - Copyright © Stock Photo / Register Mark Higher blood levels of homocysteine also often result from subnormal intakes of folic acid, vitamin B₁₂ and vitamin B₆. This is because these vitamins are required to recycle homocysteine to other amino acids such as methionine and cystathionine. High blood levels of homocysteine are associated with an increased risk of cardiovascular, cerebrovascular (narrowed arteries in the brain), and peripheral vascular disease (narrowed blood vessels in the arms, hands, legs and feet. Narrowed arteries in the brain (cerebrovascular disease) have been shown to be associated with decrements in psychomotor speed and on tests measuring fluid and visual abilities. Such cognitive dysfunction, therefore, may stem from high levels of homocysteine. As previously stated, vitamins B₆, B₁₂ and especially folic acid are key nutrients that prevent and reverse high blood levels of homocysteine.

In the Normative Aging Study, subjects with high levels of homocysteine performed, on average, like patients with mild Alzheimer's disease. They also exhibited difficulty in copying the most complex spatial figures. For example, few subjects in the highest 25 percent range of homocysteine concentrations completed the cube (22 percent) and tapered box (17 percent) correctly. By comparison, these figures are mastered by 50 percent of schoolchildren by the age of 13. Subjects with the lowest blood homocysteine levels demonstrated the best results on these tests.

Supplement Support

Taken together, the body of evidence continues to support the contention that B vitamin nutritional status is crucial to the development and preservation of mental capacities throughout our lifetime. The sad reality is that many midlife and older members of society have poor dietary intake and nutritional status of various B vitamins. Pay attention to foods that are rich sources of these important B vitamins and talk to your doctor about the multitude of benefits available from daily use of a well-formulated multiple vitamin and mineral supplement.

B Vitamins: The Big Eight

Vitamin B₁ (thiamine): Involved in nervous system and muscle function, various enzyme processes and production of hydrochloric acid, which assists in digestion. Very little is stored by the body, so depletion can occur in as little as two weeks.

Vitamin B₂ (riboflavin): Necessary for normal cell function, growth and energy production. Deficiency is rare because small amounts are present in most animal and plant tissues, so there are abundant dietary sources.

Vitamin B₃ (niacin): Includes niacin and niacinamide. Often found in combination with other B vitamins. A well-accepted natural treatment for high cholesterol.

Vitamin B₅ (pantothenic acid): A component of coenzyme A, a molecule necessary for numerous cellular chemical reactions; key in carbohydrate, protein and fat metabolism, and hormone and cholesterol synthesis. Deficiency only occurs in cases of severe malnutrition.

Vitamin B₆ (pyridoxine): Required for the synthesis of serotonin and norepinephrine (brain neurotransmitters) and for the formation of myelin, which forms an insulating layer around neurons. Mild deficiency is common, with severe deficiency affecting the peripheral nerves, skin, mucous membranes, and blood cell system.

Vitamin Pills - Copyright â Stock Photo / Register Mark Vitamin B₇ (biotin): Also known as vitamin H, recent studies suggest biotin is necessary for DNA replication and gene expression. Deficiency is extremely rare because the body can recycle previously used biotin and daily intake requirements are small.

Vitamin B₉ (folate): Consumption during pregnancy prevents deficiency and anemia in pregnant women; low levels during pregnancy may contribute to birth defects such as cleft lip and palate.

Vitamin B₁₂ (cyanocobalamin): Vitamin B₁₂ helps maintain healthy nerve cells and red blood cells, and is needed to make DNA. The human body can store several *years* worth of this vitamin, so deficiency is extremely rare.

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