

Vitamin B12 Blood Levels Linked to Slower Brain Aging in Subjects 60 Years and Older

James Meschino DC, MS

An important study was published in the Journal of the American Medical Association; Psychiatry, in June of 2016. It provided additional evidence that high blood levels of vitamin B12 can slow the shrinking of the brain that commonly occurs after age 60. Previous studies have shown that vitamin B12 and other B-vitamins (folic acid and vitamin B6) can slow the rate of brain atrophy in older subjects with mild cognitive impairment and decrease risk of progression to Alzheimer's disease. Overall, the emerging evidence suggests that if you can slow or prevent the shrinking of the brain, which is common after age 60, then you may decrease your risk of dementia and Alzheimer's disease quite substantially.

In this latest study published in JAMA-Psychiatry, data from the Swedish National Study on Aging and Care was presented. The study followed 501 subjects, aged 60 years and older, from 2001 – 2009, who were free from dementia at the beginning of study. MRI imaging of their brains were conducted in 299 of the subjects routinely during the 6-year follow-up period. Results showed that individuals with higher blood levels of vitamin B12 showed a significant decrease in the rate of total brain tissue volume loss (atrophy) than individuals with lower blood levels of vitamin B12.

Vitamin B12 is required to make a number of brain neurotransmitters, and has been shown to have neuroprotective effects, which may directly slow brain shrinking, but it also lowers a chemical in the blood known as homocysteine. High Homocysteine is known to be very damaging to the brain, as well as cerebrovascular blood vessels, and high blood levels of homocysteine are strongly correlated with brain atrophy and risk of Alzheimer's disease in many studies. In this study, higher homocysteine was also linked to more rapid brain volume shrinkage. So there are at least two ways in which vitamin B12 may slow brain shrinking – by directly preventing loss of brain cells and by lowering homocysteine blood levels.

As well, in the 2016 JAMA-Psychiatry study individuals with lower vitamin B12 levels and/or high homocysteine levels, also showed increased White Matter Hyperintensity (WMI) on their MRI scans, which is strongly tied to increased risk for cognitive decline and other mental health disorders. These studies are important because we know that mild cognitive impairment (MCI) is the step that precedes development of Alzheimer's disease (1).

We also know this: people over 60 years of age who do not have MCI, still have a brain shrinkage rate of 0.5 % a year. People with MCI have a brain shrinkage rate of 1% - double that of someone with no cognitive decline. Alzheimer's patients show an average brain shrinkage of 2.5% per year. So anything that slows brain shrinkage is considered to be an invaluable way to preserve cognition as we age.

This brings us to the Oxford Project to Investigate Memory and Aging (OPTIMA study and VITACOG study). In this study researchers recruited 172 individuals older than 70 years old, who already had MCI.

They gave half the subjects folic acid - 800 mcg; vitamin B12 – 500 mcg, and vitamin B6-20 mg, per day for two years. The other half got the placebo pill. The study showed that B-vitamin supplementation slowed brain atrophy by 30%, on average, and in some cases up to 53%.

Cognitive tests showed that the greater the rate of brain atrophy, the more rapid the decline in cognitive function (2).

Summary

The evidence suggests, overall, that slowing brain atrophy is an important feature of maintaining cognitive function with aging. Thus far, only B-vitamin supplementation has been able to show this effect in human clinical intervention studies. There are no drugs yet that can do this, at least not this dramatically. I think that preventing total brain atrophy as we age is a fascinating area that is strongly linked to a patient's healthy life expectancy and quality of life, so I believe it is a topic to discuss with all patients 60 years and older. As such, simple blood tests to determine homocysteine, vitamin B12 and red blood cell folic acid levels, should be undertaken to assess the patient's risk profile. In most cases these blood levels can be optimized using a simple B-vitamin supplementation regimen.

References:

1. <http://archpsyc.jamanetwork.com/article.aspx?articleid=2517517> (JAMA-Psychiatry, June 2016)
2. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0012244> (VITACOG study, Sept 2010)