

B-Vitamin Supplementation Proven to Slow Brain Aging and Preserve Cognitive Function in Older Patients

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The Oxford Project to Investigate Memory and Ageing (OPTIMA study) published the results of a key aspect of their study in the online journal *Public Library of Science ONE* 2010 (Author D. Smith et al - Oxford University, England). In this arm of the study they investigated the effect of B-vitamin supplementation on various parameters of brain aging and associated cognitive function. The study group consisted of 168 individuals over 70 years old with mild cognitive impairment.

The treatment group was given daily supplementation of the following B-vitamins:

- folic acid - 800 mcg
- vitamin B12 - 500 mcg and
- vitamin B6 - 20 mg

The main outcome measured was *change in rate of whole brain atrophy* on MRI investigation, after 24 months of supplementation, compared to the placebo group.

The results of the study showed the following:

1. The group taking the B-vitamin supplementation cocktail was shown to slow the rate of brain atrophy by 30 percent, on average, and in some cases patients experienced reductions as high as 53 percent.
2. Greater rates of atrophy were associated with lower cognitive test scores.

How Do B- vitamins Slow Brain Atrophy and Preserve Brain Function?

There are two mechanisms that most likely explain the value of B-vitamin supplementation in slowing brain atrophy and preserving cognitive function. Folic acid, Vitamin B6 and Vitamin B12 are required to prevent a rise in homocysteine, which is known to damage brain cells and brain blood vessels. Higher blood homocysteine levels have been linked to accelerated brain atrophy in a number of studies. In addition, certain B-vitamins are also required for brain cells to synthesize important neurotransmitters, which are required for normal cognition, attention, memory, focus and other aspects of healthy brain function. For example, B-vitamins are required for the synthesis of dopamine, epinephrine, nor-epinephrine, serotonin and acetylcholine. Based on the study findings, optimal B-vitamin status, achieved via supplementation, appears to be required to slow age-related brain atrophy and preserve cognitive function, with respect to these two known mechanisms of action.

The Aging Brain

We have known for many years that in the elderly, the brain shows progressive atrophy. Atrophy occurs even in cognitively healthy subjects, but is much more accelerated in patients suffering from Alzheimer's disease. Studies show the following:

- An intermediate rate of atrophy is found in people with mild cognitive impairment (MCI)

- People over 60 yrs without MCI normally have brain shrinkage of approximately **0.5 %** per year.
- Individuals showing MCI normally show a brain atrophy rate that is twice as fast, at approximately 1% per year
- Alzheimer's patients can lose 2.5 % of brain volume per year (1)

My Recommendation (Prevention) for Lifelong Healthy Brain Function:

1. Take a High Potency Multiple Vitamin and Mineral that is enriched with antioxidants and a B-50 Complex. A formula of this type not only provides B-vitamins at meaningful doses, but also should provide 400 IU of vitamin E, which is known to protect the brain from free radical damage. Free radical damage is a consistent feature in Alzheimer's disease, Parkinson's disease and other neurodegenerative diseases. Vitamin E supplementation has been used to successfully slow the progression of Alzheimer's disease and Parkinson's disease in various clinical trials. (2)
2. Take an Essential Fatty Acid supplement that contains 400 mg each of fish, flaxseed and borage oil -3 caplets per day. A number of studies have shown a correlation between higher intake levels, blood levels, and/or brain levels of omega-3 fats and a reduction in risk of Alzheimer's disease, in various populations. (3)
3. After age 55 take a supplement that will help preserve acetylcholine levels (memory chemical) in the brain, consisting of CDP-choline, phosphatidylserine, huperzine A and bacopa monnieri.(4)

Other Lifestyle Strategies of Importance to Maintaining Cognitive Function:

- Limit alcohol consumption, as it kills nerve cells
- Avoid all recreational drugs
- Do not smoke
- Avoid high animal fat foods as they clog brain blood vessels with cholesterol deposits (fish is the exception)
- Exercise regularly to increase brain blood flow
- Get adequate sleep
- Help patients reduce their reliance on many prescription drugs where possible (e.g., Chiropractic care can reduce or eliminate need for analgesics, muscle relaxants and anti-inflammatories. Improved lifestyle management in some cases may reduce need for cholesterol-lowering drugs, diabetic drugs, triglyceride-lowering drugs, anti-hypertensive drugs, anti-depressant and anti-anxiety drugs)

Other Anti-Aging Brain Strategies

As individuals get older, it is important to keep the brain forming new neural circuits or degeneration will likely occur. There are a number of suggested ways to form these new neural circuits and keep the old ones alive. Some valuable ideas taken from the book, *Change Your Brain, Change Your Life* (D. Amen MD), involve the following:

- Dance lessons
- Ping pong

- Learning a musical instrument
- Learning a foreign language
- Learn things that are outside your normal realm of knowledge (5)

I also highly recommend that you read the book by Dr Daniel Amen, *Change Your Brain, Change Your Life*, for additional information on this topic.

Conclusion

The finding from the OPTIMA study that B-vitamin supplementation can slow brain atrophy in older subjects and help to preserve cognitive function is a major discovery and breakthrough. It is important to point out that no drugs, thus far, have shown an ability to slow brain atrophy, which, in my view, makes this research important to holistic health providers. Also intriguing is that fact that the dosages of B-vitamins required to achieve these brain anti-aging effects, exceeds that which can be provided by food alone. Hence, the argument in favor of targeted, evidence-based, nutritional supplementation continues to unfold.

References:

1. <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0012244>
2. http://www.dynamicchiropractic.com/print_friendly.php?pr_file_name=http%3A%2F%2Fwww.dynamicchiropractic.com%2Fmpacms%2F%2Fdc%2Farticle.php%3Fid%3D54924%26no_paginate%3Dtrue%26p_friendly%3Dtrue
3. http://www.dynamicchiropractic.com/print_friendly.php?pr_file_name=http%3A%2F%2Fwww.dynamicchiropractic.com%2Fmpacms%2Fdc%2Farticle.php%3Fid%3D52256%26no_paginate%3Dtrue%26p_friendly%3Dtrue
4. <http://www.dynamicchiropractic.com/mpacms/dc/article.php?id=53356>
5. D. Amen. MD. *Change Your Brain, Change Your Life*. Three Rivers Press. 1998.