

[IMAGE]

Is Copper in Your Multivitamin Increasing Your Risk of Dementia?

By David Seaman, DC, MS, DABCN

For the past year or more, I have been asked about whether it is safe to take multivitamins with copper because of a fear that is apparently spreading. The fear is that 1-2 mg of copper in multivitamins supposedly causes dementia and/or Alzheimer's disease.

The rumor appears to be based on statements made in two recently published commentaries by Brewer, who says to "check your multi-vitamin mineral pill (or any other supplement pills) and see if it contains copper. If it does, throw it out." Most multivitamin / mineral supplements contain 1-2 mg of copper.

If Brewer is correct, then how could people with mild Alzheimer's disease take 8 mg of copper daily for 12 months and not have greater Alzheimer's progression than placebo? And moreover, if it were so obvious that 1-2 mg of supplemental copper caused dementia / Alzheimer's, why would researchers give 8 mg per day for 12 months straight?

The reason for supplementing Alzheimer's patients with copper is because researchers identified that copper *deficiency* might be a cause of Alzheimer's, so they compared 8 mg of supplemental copper per day with placebo. The outcome was that the rate of progression was *identical* between groups. Surely if a 1-2 mg of copper in a multivitamin / mineral causes Alzheimer's in people without Alzheimer's, then 8 mg would make it worse in those already compromised. Additionally, there were no toxic side effects identified in the group supplemented with 8 mg of copper.

The fact that 8 mg per day of supplemental did not increase Alzheimer's expression is not surprising, as the upper tolerable limit for copper ingestion is set at 10 mg per day. In fact, "copper toxicity is rather rare in humans and animals, because mammals have evolved precise homeostatic control of copper due to the high reactivity of the free metal." Free copper in cells and in circulation always exists in low concentrations and is primarily bound to proteins. However, a chronic excess of free copper, like iron, leads to the overproduction of free radicals.

With the above in mind, studies have identified that circulating free copper is elevated in patients with Alzheimer's disease. Interestingly, copper is also elevated in patients with type 2 diabetes. Are we to leap to the conclusion that copper causes Alzheimer's *and* type 2 diabetes? No; that is also the wrong conclusion.

However, if one were to leap to that conclusion, you can see why one might conclude that the "copper sky is falling" and we should all stop taking multivitamins lest we rapidly succumb to dementia. This would be akin to avoiding water consumption because in excess, as in drowning, water can kill you – clearly an absurd assumption. Instead of blaming copper, we should investigate why copper can be elevated in patients with Alzheimer's and diabetes.

Inflammation and Copper: The Connection

It should be understood that both Alzheimer's and type 2 diabetes are caused by chronic inflammation. It appears that circulating copper levels increase in a fashion commensurate with a patient's degree of chronic inflammation. By 1991, researchers knew serum copper levels were elevated in patients with diabetic complications, lymphocytic leukemia, inflammation, atherosclerosis, and hypertension in the absence of diabetes. So, elevated copper levels in Alzheimer's patients should not be a surprise.

Even earlier, in 1985, researchers identified that "serum copper and/or ceruloplasmin act as acute-phase reactants in vascular disease, inflammation, and malignancy." In other words, copper *normally* elevates in these conditions, independent of copper intake.

Additional acute-phase reactants include ferritin, hsCRP and serum amyloid A. They all normally rise during acute inflammatory events, such as in an infection, and then fall just as rapidly back to normal. When they stay elevated, it is because a chronic inflammatory state exists. Type 2 diabetes is an example of such a state. Similarly, as glycemic control worsens, serum copper levels can rise accordingly.

The Take-Home Message

We know chronic excess of serum copper and iron can generate free radicals. So, the goal should be to avoid chronic inflammation, which is caused by the regular consumption of refined carbohydrates, omega-6 fatty acids and trans fats. Interestingly, higher levels of copper consumption may be linked to cognitive decline in subjects eating a pro-inflammatory diet, but not in those with an anti-inflammatory diet. So, it is

not an issue of dietary or supplemental "copper"; it is about the patient's inflammatory state.

Thus, according to the available evidence, if we avoid pro-inflammatory foods and maintain proper glycemic control, 1-2 mg of copper in a multivitamin / mineral will have absolutely no effect on cognitive function. Fears about this relationship are unfounded and should be abandoned.

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