

Vitamin B12: A Key to Healthy Aging



Planning the Lesson

- *Review the leader's guide
- *Collect samples of foods higher in vitamin B12 (examples: box of fortified cereal; egg beaters that are fortified and ones that are not; box of prepared chicken; wrapping from frozen fish; empty milk container; yogurt container)
- *Obtain visual flip chart from local Extension Office for use with the lesson

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OBJECTIVES

- ▶ To learn more about the importance of vitamin B12 in healthy aging
- ▶ To recognize possible symptoms of deficiency
- ▶ To understand food sources and supplement options
- ▶ To become a proactive health consumer

Introduction

There are many keys to healthy aging, but one that is often overlooked because of limited popular press information is that of vitamin B12 deficiency or pernicious anemia. This lesson defines anemia. Pernicious anemia, which can produce serious and sometimes irreversible nerve damage before diagnosis, and its symptoms are explained, along with the interaction of other vitamins that potentially mask or cover up this type of anemia. And finally, this lesson promotes being a proactive informed healthcare consumer by encouraging participants to ask more questions of their healthcare providers.

What is Anemia?

Anemia is a decrease in hemoglobin (a protein/iron compound in the blood that carries oxygen to the cells from the lungs and carbon dioxide away from the cells to the lungs) in the blood. Anemia may be caused by a decrease in red blood cell production, an increase in red blood cell destruction, or a loss of blood.⁽¹⁾

Types of Anemia

The many different types of anemia are determined by the blood cell size and blood cell content. The type familiar to most consumers is *iron-deficiency anemia*. Eating more iron-containing foods, or foods where the iron is more bio-available and easily absorbed such as red meats, is often encouraged. Supplementation can also be prescribed.

Another type of anemia, *pernicious anemia*, is a deficiency of vitamin B12. A diagnosis of this type of anemia can easily be missed, particularly in older adults.

Symptoms of Pernicious Anemia

Common symptoms of pernicious anemia are weakness in the legs, difficulty in walking and balancing, tingling and numbness in the hands and feet, and nerves becoming highly responsive to any mild stimulation.

Vitamin B12 deficiency can lead to mental confusion, mild depression, apathy or irritability and can progress to dementia. Victims may also suffer loss of appetite and weight, indigestion and periodic diarrhea. These problems can develop before one is diagnosed with a B12 deficiency. In its early stages, these symptoms can be reversed but if the deficiency is not caught within a few months, the damage can be permanent⁽²⁾.

Vitamin B12 is required for proper nerve function, including the nerve cells or neurons in the brain needed for memory. Vitamin B12 also works with two other B vitamins, folate or folic acid and vitamin B6, to maintain proper levels of homocysteine, which is naturally produced in the body as a result of the breakdown of proteins. If homocysteine levels become elevated, such as when B vitamins are low, the risk of heart disease, stroke and Alzheimer's disease and certain forms of dementia increases.

Vitamin B12 Deficiency in Old vs Young

In younger individuals, a vitamin B12 deficiency is usually the result of a problem with the stomach not secreting Intrinsic Factor (IF). A person has to have IF in order to absorb vitamin B12. When this factor is missing, then the patient must be given periodic B12 injections and no amount of food-bound vitamin B12 will be useful. The number of people who must take B12 injections is believed to be quite small ⁽²⁾.

Vitamin B12 absorption also requires stomach acid. The strong natural acid made by the stomach frees the vitamin from being bound to animal food proteins. In many persons older than age 50 years, food-bound vitamin B12 is not readily absorbed because they have developed *atrophic gastritis*, a condition in which the secretion of stomach acid and pepsin, one of the digestive enzymes, declines. Many older adults also take antacids – calcium carbonate, as in Tums® – with their meals as a calcium supplement, which further decreases their stomach's acidity.

Some researchers estimate that lowered absorption of food-bound vitamin B12 may affect as many as one in every two persons ages 60 years and older.

Food Sources of Vitamin B12

Naturally-occurring, food-bound vitamin B12 is found ONLY in animal

protein foods. These include meat, fish, poultry, eggs and milk products.

Some of the cereals and other grain products on the market are fortified with vitamin B12, which means that the vitamin has been added during processing.

Vitamin B12 Recommendations

For adults ages 50 years and older, the Dietary Reference Intake for vitamin B12 is 2.4 micrograms, or mcg ⁽³⁾.

People older than 50 years are advised to meet their need for vitamin B12 mainly by consuming foods fortified with vitamin B12 or a supplement containing vitamin B12, in addition to dietary animal protein, because of the decrease in stomach acid that can occur with aging. Since the vitamin B12 in fortified foods or in a supplement does not require stomach acid in order to be absorbed, it is more readily available in these forms.

On many multi-vitamin/mineral supplements, vitamin B12 is listed as its chemical name, cobalamin. The most bioavailable form – the kind easiest to absorb – is cyanocobalamin ⁽⁴⁾.

There are a variety of supplements on the market. Work closely with your doctor and pharmacist for the best result for you ⁽⁵⁾.

CAUTION with Supplements

A deficiency of the B vitamin folate often accompanies lowered vitamin B12 levels. However, taking only folate (also labeled folacin or folic acid) supplements can mask the nerve symptoms and metabolic disturbances associated with vitamin B12 deficiency. Therefore, folate supplements should not be taken as a single supplement. A multiple vitamin supplement of no more than the DRI of 400 mcg folate is safest.

More research is necessary to determine the extent of vitamin B12 insufficiency among older adults. Evidence suggests that physicians should be on the

lookout for such a deficiency in their older patients who have nerve and/or cognitive symptoms (such as an inability to think clearly) but who do not have the characteristic anemia and low serum cobalamin concentrations seen in those with pernicious anemia ⁽²⁾.

Proactive Healthcare Consumerism

Being a proactive informed healthcare consumer is becoming extremely important in our society. We encourage you to work closely with your doctor, dietitian

and pharmacist at all times when exploring supplements or new drug therapies in order to avoid medication-food-supplement interactions and toxicity.

Take the time to become informed by reading research-based articles and by listening to the latest research in areas of nutritional health and then ask the members of your healthcare team how such an approach might be appropriate for you personally.

Refer to the Complementary and Alternative Medicine (CAM) lesson by Barbara Lohse Knous, PhD, K-State Research and Extension publication MF-2558, at www.oznet.ksu.edu for further information.

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The information in this fact sheet is for educational purposes only and is not intended as a substitute for advice from your health care provider.

References:

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2. Clarke, M. 1994. Many elderly low in vitamin B12. Timely Topics in Human Nutrition series. Available at www.oznet.ksu.edu/dp%5Ffnut/timely/B12.htm (Accessed 11/29/04.)
3. Mason, A.C., Evers, W.D., Hanley, E., Getty, V.M., Blemker, C., Lyons, K.L. 2001. Vitamins and minerals in the Food Guide Pyramid - Where are they? North Central Regional publication #540. Available at www.ces.purdue.edu/extmedia/CFS/NCR-540-W.pdf (Accessed 11/29/04.)
4. Duyff, R.L. 1996. Vitamin B12: A challenge for vegans. The American Dietetic Association's Complete Food & Nutrition Guide, pg 557.
5. Higgins, M.M. 2003. Eat smart! Be smart! A recipe for keeping your brain in shape. Part 2 of the Vim and Vigor for Older Adults educational CD. For more information, contact Mary Meck Higgins, PhD, Department of Human Nutrition at Kansas State University, via email at mhiggins@humecc.ksu.edu or by telephone at 785-532-1671.