VitalNews

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Homocysteine… How do we pronounce it?

What is it? Why is it grabbing the attention of so many people; and why do we want to rid our bodies of excess levels of this substance?

WRITTEN BY LAURA BAUM M.D.

First of all let's tackle the pronunciation. Think: Michelangelo's Sistine chapel, or, sounds like: "homo-sis-teen." Like everything else in life, it's easy once you know how.

Now that we can pronounce it, what exactly is this "homocysteine?" Simply stated, it's an amino acid. Our bodies are built on proteins, and the building blocks of all proteins are amino acids. Methionine, an essential amino acid derived from dietary protein, is the source of all homocysteine found in our bodies. In the liver, methionine is continuously converted to homocysteine, and back again to methionine. This reversible cycling of these two amino acids is dependent upon vitamins B12 and folic acid. Deficiencies of either of these vitamins can lead to an unhealthful accumulation of homocysteine. A second irreversible process converts homocysteine to cysteine, which can then be excreted in the urine. This process is dependent upon the help of yet another vitamin, B6. Once again, a deficit in B6 can lead to a build up of too much homocysteine.

This then brings us to the most critical issue: Why are so many doctors and patients concerned with high blood homocysteine levels? The answer lies in a growing body of medical literature which has found this amino acid to increase our risk of developing several common and devastating illnesses. Heart attacks, strokes, Alzheimer's disease, and most recently, osteoporotic bone fractures, have all been shown to be more common in people with high homocysteine levels. Articles in our most prestigious journals (The New England Journal of Medicine, The Journal of the American Medical Association, Lancet…) have reported these findings. The reason high homocysteine levels predispose to the development of these ailments is being carefully evaluated by our top scientists and doctors, but it is felt that several mechanisms are at work. Homocysteine can directly damage our arteries' inner linings, leading to the build up of plaque and blood clots. It can also oxidize LDL cholesterol, making this type of fat more likely to cause coronary artery and carotid artery disease. High homocysteine levels also block our body's natural ability to break down clots. Thus, when clots do form in the arteries feeding our brains and hearts, high homocysteine levels make it harder for our bodies to eliminate them before they totally block the flow of oxygen to these vital organs, causing strokes and heart attacks. It has even been shown that DNA damage can occur in brain cells, causing their premature death, when homocysteine levels are high.

So what are we to do about this problem of high homocysteine levels? First of all, life style changes can help. Quitting smoking, decreasing caffeine consumption, exercising more and eating less can all help lower homocysteine levels. Supplementation with vitamins B6, B12, and folic acid can also help reduce homocysteine levels to a normal range. At times, N-acetylcysteine can be taken as a nutritional supplement to help bring down levels as well. Currently, studies are being conducted to evaluate the long term benefits of diminishing homocysteine levels to normal. It is hoped that normalization of these levels in patients with high blood homocysteine will help reduce the incidence of heart attacks, strokes, Alzheimer's and even osteoporotic fractures.

inside

Why Take HomocysteineFormula?

WRITTEN BY SETH J. BAUM M.D.

"Homocysteine-lowering therapy significantly decreases the incidence of major adverse events…"

Elevated homocysteine levels represent an independent risk factor for a number of serious ailments: coronary artery disease, cerebrovascular accidents, peripheral vascular disease, Alzheimer's disease and other dementias, and osteoporotic fractures. Several pathogenic mechanisms for these connections have been postulated, and many doctors believe that lowering homocysteine levels will decrease your chance of developing these ailments, but we are eagerly awaiting the results of trials to prove our hypotheses. Fortunately the results of these trials are beginning to emerge. In August 2002, the Swiss Heart Study was published in JAMA (the Journal of the American Medical Association). It demonstrated that homocysteine-lowering therapy "significantly decreases the incidence of major adverse events after percutaneous coronary intervention (angioplasty)."

Homocysteine levels are raised by the following: tobacco use, high cholesterol, excessive coffee consumption, high calorie diets, sedentary lifestyles, renal insufficiency, hypothyroidism, oral contraceptives and theophylline. Low levels of B vitamins (folic acid, B6, and B12) also contribute significantly to elevated homocysteine. HomocysteineFormula contains folic acid, vitamin B6, and vitamin B12, the same vitamins used in The Swiss Heart Study which readily lowered elevated homocysteine levels. Please be aware that a simple blood test can help your physician determine whether homocysteine-lowering therapy is indicated for you. Also know that if you are taking HomocysteineFormula to improve a metabolic abnormality, your doctor may wish to follow your homocysteine blood levels in order to ensure the best possible results. The occasional patient may require additional supplementation with N-acetyl-cysteine (NAC) in order to achieve an optimal homocysteine level.

FEATURES

- Folic Acid – Needed for energy production and the formation of red blood cells. It strengthens immunity by aiding in the proper formation and function of white blood cells. It also helps maintain arterial heath and limit the accumulation of homocysteine.
- Vitamin B6 – Plays a role in immunity and helps maintain arterial health. It also limits the accumulation of homocysteine.
- Vitamin B12 - Needed to prevent anemia. It aids folic acid in regulating the formation of red blood cells. This vitamin is required for the synthesis of protein, and the metabolism of carbohydrates and fats. It also helps maintain healthy arteries and limit the accumulation of homocysteine.
- Pure USP Pharmaceutical Grade quality
- Independently assayed by FDA registered laboratories for safety and purity.

SUPPLEMENT FACTS

Serving size: one tablet

Vitamin B6	25 mg
Vitamin B12	1 mg
Folic Acid	3 mg

medical news and events

Elevated Homocysteine Linked to Increased Hip Fractures Investigators examined the association between total homocysteine blood levels and the risk of hip fractures in a group of older men and women enrolled in the Framingham Study. Based on evidence that the prevalence of osteoporosis is increased in people with homocystinuria (a rare genetic biochemical abnormality that causes elevated homocysteine and severe occlusive vascular disease), it was hypothesized that high homocysteine levels may interfere with collagen crosslinking and impair bone strength. To test their hypothesis the researchers measured homocysteine levels in the blood and looked for a relationship with hip fracture risk. As was reported in *The New England Journal of Medicine*, May 13, 2004, they found that elevated plasma levels of homocysteine correlate with a significantly increased risk of hip fractures in the elderly. The bottom line: An increased homocysteine level appears to be a strong and independent risk factor for osteoporotic fractures in older men and women.

Homocysteine Linked to Alzheimer's Risk Researchers including Jacob Selhub, Paul Jacques, and Irwin Rosenberg used data on 1,092 people from the longitudinal Framingham Heart Study and found that high blood levels of the amino acid homocysteine increase the risk of developing

Did you know....?

- Scientists have discovered that high baking temperatures concentrate a healthful antioxidant called pronyl-lysine in the crust of bread – it's up to eight times more abundant there than in the bread's soft interior.

- One trait common to people over 100 is a good sense of humor and a positive attitude toward life. Optimism has been linked to better immune function, lowered levels of stress-related chemicals, and longer life – all good reasons to look on the bright side.

- Glucosamine Sulfate (NOT Glucosamine HCl) has been proved to diminish symptoms and actually improve joint health in patients with osteoarthritis. Read more about this in our next *VitalNews*.

intelligent indulgences

Tabbouleh

INGREDIENTS

1½ cups uncooked bulgur
1½ cups boiling water
½ cup dried figs, halved
1 cup chopped fresh parsley
½ cup chopped fresh mint
½ cup sweetened dried cranberries
½ cup lemon juice
2 tablespoons olive oil
½ teaspoon salt
½ teaspoon black pepper
1 (15½ ounce) can chickpeas, drained

Combine the bulgur and boiling water in a large bowl. Cover and let stand 30 minutes. Stir in figs and remaining ingredients; cover salad and chill thoroughly.

With the addition of dried fruit and chickpeas this tabbouleh has about 15 grams of fiber and is high in folate and vitamin B6. Consider serving over a bed of fresh spinach to further boost these values.

Alzheimer's dementia by 40 %. *The New England Journal of Medicine*, February 14, 2002.

High Homocysteine Levels Increase the Risk for Heart Attacks in People with Type 2 Diabetes Researchers studied 830 Finnish men and women with type 2 diabetes and found that high levels of homocysteine were associated with increased risk for fatal and nonfatal heart attacks, even after accounting for several other risk factors. The conclusion: Homocysteine is an independent risk factor for heart attacks in adults with type 2 diabetes. *Annals of Internal Medicine*, January 20, 2004.

Decreased Rate of Coronary Restenosis after Lowering of Plasma Homocysteine Levels Researchers having previously demonstrated an association between elevated total plasma homocysteine levels and restenosis after angioplasty studied the effects of "folate" treatment on 205 patients for six months after successful coronary angioplasty. What they found was that treatment with a combination of folic acid, vitamin B12 and vitamin B6 reduced homocysteine levels and reduced the rate of restenosis and the need for revascularization of the target lesion after coronary angioplasty. *New England Journal of Medicine*, November 29, 2001

q&a patient queries

Q] What is folate?

A] Folate is the name for the family of folic acids found in food. Folic acid is a B vitamin. It is involved in essential cellular reactions. A frank deficiency of folic acid can cause megaloblastic anemia. Inadequate intake is also related to birth defects, premature births, cervical dysplasia, and many different cancers. As you now know, inadequate folic acid also causes buildup of homocysteine in the blood. High homocysteine levels can be lowered with supplemental folic acid in conjunction with vitamins B6 and B12. Some of the richest dietary sources of folic acid are green vegetables, orange juice and beans.

Q] Why is there vitamin B12 in HomocysteineFormula?

A] There are many causes of elevated homocysteine, but nutritional deficiencies represent some of the most common ones. Folic acid, B12 and B6 are all involved in homocysteine regulation and will usually effectively lower elevated blood levels. When taking folic acid supplementation patients should always take B12 so as not to develop a masked form of megaloblastic anemia, and even permanent neurologic abnormalities.

Q] What is NAC?

A] NAC, or N-acetylcysteine, is a form of the amino acid cysteine, which can act to displace homocysteine from its protein binding site. Eighty percent of homocysteine in the blood is bound to protein. Once displaced into the bloodstream homocysteine is more readily metabolized and excreted from the body. NAC can be an effective adjunctive dietary supplement for those few patients who have only a partial response to supplemental folic acid and vitamins B6 and B12

our MISSION

is to enable your doctor to provide you with the best and most appropriate nutritional supplements.

To learn more about our products please ask your physician, or visit our website at www.vitalremedymd.com.

AntioxidantBalance® • Daily2Tab • DailyMultiple • HomocysteineFormula
JointFormula • N-AcetylCysteine • PureCalcium • StatinGuard® • VitalOils™

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