JH Wellness

What is Homocysteine and How does it Effect Your Health?

Homocysteine is a type of protein produced by the body and found in the blood which ideally should be present in very low quantities. Homocysteine is produced from the amino acid methionine, which is found in normal dietary protein. Homocysteine in itself is not bad for the body and it is important since the body naturally turns it into one of two beneficial substances; either glutathione or a methyl donor called SAMe. If we do not have optimal amounts of B vitamins in our diet, homocysteine can not be converted and this causes the level of homocysteine to rise dangerously. It becomes a concern when the homocysteine rises because high homocysteine levels have been linked to many diseases. When the body is not optimally nourished, homocysteine can accumulate in the blood increasing the risk for over fifty diseases including heart attacks, strokes, certain cancers, diabetes, depression and Alzheimer's disease.

According to Patrick Holford, homocysteine is the one factor that can determine better than any other whether you will live a long and healthy life or die young.

According to Elson Haas, MD there are three vitamins that are especially important for the conversions of homocysteine to take place, B_6, B_{12} and folate (folic acid). Without the adequate amounts of these vitamins, homocysteine can rise to problematic levels in the bloodstream and increase the risk of heart disease. High homocysteine has also been linked to increased risk of diabetes, Alzheimer's disease, and rheumatoid arthritis.

According to Lester Packer, PHD and Carol Colman, folic acid helps to maintain normal levels of homocysteine, and amino acid in the body. In a study performed at Harvard Medical School, men with even slightly elevated levels of homocysteine were three times more likely to have heart attacks than those with normal levels. Elevated blood levels of homocysteine are now a recognized risk factor for cardiovascular disease.

Plasma homocysteine levels are strongly influenced by diet, as well as by genetic factors. The dietary components with the greatest effects are folic acid and vitamins B_6 and B_{12}. Folic acid and other B vitamins help break down homocysteine in the body. Several studies have found that higher blood levels of B vitamins are related, at least partly, to lower concentrations of homocysteine. Other recent evidence shows that low blood levels of folic acid are linked with a higher risk of fatal coronary heart disease and stroke.

Methylation is the ability of the body to maintain chemical balance that hinges upon its ability to add or subtract molecules called methyl groups. This is how the body turns one thing into another. The body responds to stress by adding a methyl group to noraadrenaline to produce adrenaline. Once the stress goes away the body responds by removing a methyl group from adrenaline, turning it into noradrenaline. This kind of chemical reaction occurs a billion times every second, keeping everything in balance.

The dietary recommendations for reducing homocysteine levels according to Patrick Holford are as follows:

- Eat less fatty meat
- Eat more fish and vegetable protein

- Eat your greens
- Have a clove of garlic a day
- Do not add salt to your food
- Cut back on tea and coffee
- Limit alcohol intake
- Reduce stress whenever possible
- Stop smoking
- Correct estrogen deficiency

According to Patrick Holford, a high strength multivitamin and homocysteine supplements should be taken as part of supplement regime everyday. He also instructs certain levels of supplements to be taken for different homocysteine levels. Please see Holford's chart below:

Nutrient	No Risk: below 6	Low Risk: 6-9	High Risk: 10-15	Very High Risk: Above 15
Folic acid	200 mcg	400 mcg	1,200 mcg	2,000 mcg
B_{12}	10 mcg	500 mcg	1,000 mcg	1,500 mcg
B_6	25 mcg	50 mcg	75 mcg	100 mcg
B_2	10 mg	15 mg	20 mg	50mg
Zinc	5 mg	10 mg	15 mg	20 mg
TMG	500 mg	750 mg	1.5-3 g	3-6 g

Special cautions and risk factors according to Patrick Holford are as follows:

- Genetic inheritance (family history of heart disease, strokes, cancer, Alzheimer's disease, schizophrenia or diabetes)
- Aging
- Being of the male gender
- Estrogen deficiency
- Excessive alcohol, coffee or tea intake
- Smoking
- Lack of exercise
- Hostility and repressed anger
- Pregnancy
- Being a strict vegetarian or vegan
- High-fat diet with excessive red meat
- High fat dairy intake
- High salt intake
- Inflammatory bowel diseases (celiac, Crohn's, ulcerative colitis)
- H. Pylori-generate ulcers

According to Holford, a good precaution that should be taken is to be sure to take more then 900mcg of folate a day and to keep your homocysteine level below 6. Keeping this level will only benefit your health and reduce your risk to diseases related to high homocysteine levels.

References:

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