Homocysteine

What is homocysteine?

Homocysteine is a sulphur containing amino acid that is synthesized by the body rather than ingested via diet. It is created from a process called demethylation of another amino acid, methionine and can be recycled back into methionine (a benign amino acid) or converted into cysteine (a benign amino acid with antioxidant properties) in the presence of adequate B-vitamins.

Why measure homocysteine?

High homocysteine levels are linked to such vascular disorders as heart disease, stroke and peripheral artery disease as well as dementia and Alzheimer's disease. Specifically, elevated homocysteine is associated with thrombosis (blood clots) causing a 2-3 fold increase in risk of cardiovascular events. It is considered as strong of an indicator of vascular disease as smoking or hypertension. Evidence also suggests a link between elevated homocsysteine and migraines, erectile dysfunction, shortened telomeres (a marker for aging) and even age-related hearing loss. Homocysteine levels should be less than 11 umol/mL.

Why is homocysteine harmful?

Some research suggests that high levels of homocysteine may act as an arterial abrasive and physically damage arteries. This arterial trauma affects the endothelial lining of the arteries, which normally responds to enzymatic or hormonal cues to dilate or contract. When the endothelial lining of the blood vessels becomes dysfunctional, vascular health is seriously compromised. High homocysteine can also stem from renal disease since homocysteine is partially cleared through the kidneys. Patients with kidney disease often have very high levels of homocysteine, which some consider the primary reason that vascular disease so often coincides with renal failure.

How is homocysteine treated?

In many cases, high levels of homocysteine can be lowered by low-cost, non-invasive therapy with little side effects. Correcting a deficiency in folate, vitamin B6 or vitamin B12 can reduce homocysteine levels significantly. Each of these vitamins is necessary for the proper conversion of homocysteine into methionine and a deficiency in any one of them can cause homocysteine levels to rise. Similarly, supplementation with the amino acid betaine or cysteine may lower homocysteine levels, especially in the absence of B vitamin deficiencies. Other modifiable contributors to elevated homocysteine include smoking and high meat diets.

References

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