Folic Acid

Folic acid, also known as folate or vitamin B9, is a water-soluble vitamin that is a member of the B-vitamin family. The name folate is derived from *folium*, the Latin word for leaf, likely because of its presence in green leafy vegetables. However, it is more commonly taken in supplement form because unlike folate that occurs naturally in food sources, supplemental folic acid is nearly 100% bioavailable.

Most people know folic acid as the vitamin that is recommended for women to help prevent certain types of birth defects (neural tube defects). Many are not aware that folic acid is also good for the heart.

Numerous studies have established that low folate levels are associated with increased homocysteine levels in the blood, a risk factor for atherosclerosis or "hardening" of the arteries, deep vein thrombosis, heart attack and stroke.[1] Low serum folate levels and low dietary folate intake are also associated with increased risk of cardiovascular disease mortality.[2]

A recent study published in the journal *Circulation* provides additional support for the benefits of folate intake.[3] Johns Hopkins University cardiology research fellow An Moens, M.D., along with a team of heart experts, reported that giving a high dose of folic acid to Wistar rats offered significant protection from the damaging effects of a heart attack.

Rats that were given 10 mg of folic acid daily for one week prior to a heart attack had less myocardial dysfunction during a heart attack and sustained less cardiovascular damage than rats given a placebo.

The amount of blood pumped by the hearts of the group treated with folic acid remained near normal while blood flow to the heart was restricted for 30 minutes to simulate a heart attack. Not so for the untreated group. The amount of blood pumped by the hearts of the untreated group, measured as ejection fraction, dropped to 27 percent. The muscle wall at the front of the heart continued contracting during heartbeats in the supplement-fed group, but the muscle could barely compress in the untreated group. In addition, the supplement-fed group had smaller areas of tissue death, averaging less than 10 percent that of the untreated group. The supplement-fed group also had lower levels of damaging superoxide free radicals.

Although the mechanism responsible for the observed benefits is not fully understood, this study does support folate's role in the maintenance of normal mitochondrial function needed for healthy blood vessels. According to Dr. Moens, folate acts as an energy reserve in the heart. It provides energy—in the form of ATP—required for muscle contraction while the heart is being starved for oxygen-carrying blood by a blocked artery.

Folic acid can be consumed safely in high doses in the short term, according to senior study investigator Dr. David Kass, a professor at Johns Hopkins University School of Medicine and its Heart Institute. Although most people require a maintenance dose of around 400 micrograms of folic acid to support optimal health, some may benefit from a larger amount.

Reference:

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2. Loria CM, Ingram DD, Feldman JJ, et al. Serum folate and cardiovascular disease mortality among US men and women. *Arch Intern Med* 2000;160:3258-62.

3. Moens AL, Champion HC, Claeys MJ, Tavazzi B, Kaminski PM, Wolin MS, Borgonjon DJ, Van Nassauw L, Haile A, Zviman M, Bedja D, Wuyts FL, Elsaesser RS, Cos P, Gabrielson KL, Lazzarino G, Paolocci N, Timmermans JP, Vrints CJ, Kass DA. High-dose folic acid pretreatment blunts cardiac dysfunction during ischemia coupled to maintenance of high-energy phosphates and reduces postreperfusion injury. *Circulation*. 2008 Apr 8;117(14):1810-9.

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