

Prevention of Heart Disease in Women: Folic Acid and Homocysteine

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In the mid-to-late 1960s, several researchers first identified that high blood levels of homocysteine were associated with premature narrowing of arteries, leading to heart attacks and related heart disease. Homocysteine is thought to increase the risk for heart disease through direct toxic effects to the cells that line our blood vessels. It increases the tendency for blood platelet cells to clump together in the bloodstream, thus obstructing blood flow. It also stimulates muscle fibers beneath the blood vessels to grow into the artery, further impairing the bloodflow. High blood levels of homocysteine are considered to be a significant risk factor for stroke, heart attack, and reduced blood flow to fingers, toes and peripheral body parts.

Homocysteine is formed routinely on a cellular level in the course of normal metabolism. Fortunately, our bodies can recycle homocysteine by converting it into other important amino acids, such as methionine, cystathionine, serine and cysteine. However, to convert homocysteine into these desirable, nontoxic amino acids, our bodies require an adequate intake of the B vitamins: folic acid, B₆ and B₁₂. A number of recent studies have shown that individuals with high blood levels of homocysteine can reduce their levels by supplementing their diets with folic acid and vitamins B₆ or B₁₂. Presently, elevated levels of homocysteine are considered responsible for approximately 10 percent of all heart attacks each year in the United States.

Reporting in the *Journal of the American Medical Association* (Feb. 1998), Rimm, et al., demonstrated that women who supplement their diet with a multiple vitamin had a 24-percent lower risk of nonfatal and fatal heart attacks. During the 14-year followup, they documented 658 incident cases of nonfatal heart attacks and 281 cases of fatal heart attacks among the 80,082 women from the Nurses' Health Study. After controlling for well-known risk factors for heart disease, they showed that high intake levels of folic acid (696 mcg/day) were associated with a 31-percent lower risk for heart disease episodes, compared with lower folic acid intake levels (158 mcg/day). For vitamin B₆, there was a 33-percent lower risk for heart disease episodes in subjects ingesting 4.6 mg/day, compared with subjects ingesting 1.1 mg/day. Individuals with high intakes of both folic acid and vitamin B₆ experienced a 45-percent reduced risk for fatal and nonfatal heart attacks.

A major conclusion of this study suggests that intake of folic acid and vitamin B6 above the current recommended dietary allowance may be required to prevent heart disease. The current recommended dietary allowance for folic acid is 180 mcg/day for nonpregnant women. The average dietary intake in the United States among women is approximately 225 mcg/day. Because of evidence that this level of intake may be insufficient to minimize risk of neural tube defects (i.e., *spina bifida*), and possibly heart disease, some experts urge that the recommended dietary allowance (RDA) be reset to the earlier level of 400 mcg/day.

Findings from the Health Professional Follow-Up Study among male practitioners demonstrated that high folic acid intake was associated with a significant reduction in heart disease risk. Thus,

for both men and women, high levels of folic acid intake are strongly linked to the prevention of heart disease.

In the Nurses' Health Study, each 100 mcg/day increase in folic acid was associated with a 5.8-percent lower risk of heart disease. It is estimated that 88 percent to 90 percent of the population has dietary intakes of folic acid below 400 mcg/day.

It is difficult to obtain 400 to 700 mcg/day of folic acid without using a multiple vitamin supplement, most of which contain at least 400 mcg of folic acid. The emerging evidence continues to support the use of a daily multiple vitamin and mineral product in the prevention of heart disease; neural tube defects; certain cancers; and other conditions.

In my view, otherwise healthy adults should incorporate well-designed multiple vitamin and mineral products into their dietary intake, in addition to consuming a healthy diet. The potential for this single, simple intervention to prevent life-threatening problems is staggering when you weigh all the evidence.

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