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Life Extension Update Exclusive

Folic acid supplementation helps reduce arsenic levels

The October, 2007 issue of the *American Journal of Clinical Nutrition* published the results of a study conducted by researchers at Columbia University Mailman School of Public Health which found that supplementing with folic acid can significantly lower blood levels of arsenic, a toxic element that is ingested by drinking contaminated water. Chronic exposure to arsenic is estimated to affect more than 100 million individuals worldwide, and has been associated with an increased risk of cardiovascular disease, skin, liver and bladder cancer, and other health conditions.

In a randomized, double-blinded trial, Mailman School assistant professor of Environmental Health Sciences Mary Gamble, PhD and her associates gave 400 micrograms folic acid per day or a placebo to 130 men and women with low plasma folate levels. The subjects were part of a larger study conducted on the adverse effects of arsenic in Bangladesh, where folate deficiency is common. Total blood arsenic, as well as arsenic metabolites monomethylarsonic and dimethylarsinic acids were measured at the beginning of the trial and at twelve weeks.

At the end of the treatment period, total blood arsenic was lowered by 13.62 percent in participants who received folic acid and by 2.49 percent in the placebo group. While monomethylarsonic acid was reduced by an average of just 1.24 percent among those who received the placebo, it was 22 percent lower in those who received folic acid. Blood dimethylarsinic acid did not change, however, the compound is rapidly excreted in the urine, as was shown by an increase in urinary levels at the end of the treatment period.

Folic acid increases the methylation of inorganic arsenic, which enables more rapid elimination from the body. "Folic acid supplementation enhanced the detoxification of arsenic to a form that is more readily excreted in urine," Dr Gamble explained. "Clearly the first priority should focus on mitigation efforts to lower arsenic exposure," she noted. "But this very exciting and significant finding implies that folic acid has therapeutic potential for people who have been exposed to arsenic. Although additional studies are needed, the results of this study suggest that a simple, low-cost nutritional intervention may help to prevent some of the long-term health consequences associated with arsenic exposure for the many populations at risk."

Health Concern

Heavy metal Toxicity

There are 35 metals that concern us because of occupational or residential exposure; 23 of these are the heavy elements or "heavy metals": antimony, arsenic, bismuth, cadmium, cerium, chromium, cobalt, copper, gallium, gold, iron, lead, manganese, mercury, nickel, platinum, silver, tellurium, thallium, tin, uranium, vanadium, and zinc (Glanze 1996). Interestingly, small amounts of these elements are common in our environment and diet and are actually necessary for good health, but large amounts of any

of them may cause acute or chronic toxicity (poisoning). Heavy metal toxicity can result in damaged or reduced mental and central nervous function, lower energy levels, and damage to blood composition, lungs, kidneys, liver, and other vital organs.

Arsenic is the most common cause of acute heavy metal poisoning in adults and is number 1 on the Agency for Toxic Substances and Disease Registry's "Top 20 List." Arsenic is released into the environment by the smelting process of copper, zinc, and lead, as well as by the manufacturing of chemicals and glasses. Arsine gas is a common byproduct produced by the manufacturing of pesticides that contain arsenic. Arsenic may also be found in water supplies worldwide, leading to exposure of shellfish, cod, and haddock. Other sources are paints, rat poisoning, fungicides, and wood preservatives. Target organs are the blood, kidneys, and central nervous, digestive, and skin systems (Roberts 1999; ATSDR ToxFAQs for Arsenic).

Several studies were conducted to investigate the role of SAME in arsenic toxicity (Yamanaka et al. 1997; Tripathi et al. 1998; Goering et al. 1999). A study by Goering et al. (1999) demonstrated that arsenic interferes with DNA methyltransferases, causing the tumor suppressor genes to be inactivated. The study suggests that arsenic-induced malignant transformation is linked to DNA hypomethylation subsequent to depletion of SAME, potentially resulting in aberrant gene activation, including cancer genes.

<http://www.lef.org/protocols/prtcl-156.shtml>

Featured Products

Folic Acid & Vitamin B12 Capsules

Folic acid (folate) is a member of the B-complex family. It is found in abundance in leafy green vegetables, but is often deficient in the standard American diet. Folic acid participates in a coenzyme reaction that synthesizes DNA needed for cell growth and new cell formation and helps convert vitamin B12 to one of its coenzyme forms.

<http://www.lef.org/newshop/items/item00347.html>



SAMe (S-adenosyl-methionine) Tablets

SAMe (S-adenosyl-methionine) is an amino acid derivative normally synthesized in the body. SAMe is used by the body in three important pathways:

1. Methylation (contributing methyl groups to activate certain molecules)
2. The synthesis of polyamines (for cell growth, gene expression, neuronal regeneration, etc.)
3. Trans-sulfuration (synthesis of cysteine, glutathione, and other sulfate chemicals)

<http://www.lef.org/newshop/items/item00453.html>



Skin Care Sale Ends October 12

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Since 1980, Life Extension has been at the forefront in identifying novel and innovative antiaging therapies. Aging first displays its outward signs on the skin. Now, help combat skin aging with our exciting range of skin care products that are years ahead of the commercial cosmetics industry!

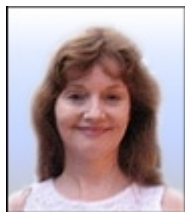
We invite you to take advantage of this special Skin Care Sale, and enjoy up to a 70% discount across a range of selected skin care products. Hurry, this incredible sale ends October 12, 2007. Order now!

<http://www.lef.org/skin/>

If you have questions or comments concerning this issue or past issues of *Life Extension Update*, send them to

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