

# Lipoic acid could reduce atherosclerosis, weight gain

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A new study done with mice has discovered that supplements of lipoic acid can inhibit formation of arterial lesions, lower triglycerides, and reduce blood vessel inflammation and weight gain – all key issues for addressing cardiovascular disease.

Although the results cannot be directly extrapolated beyond the laboratory, researchers report that “they strongly suggest that lipoic acid supplementation may be useful as an inexpensive but effective intervention strategy . . . reducing known risk factors for the development of atherosclerosis and other inflammatory vascular diseases in humans.”

The findings were made by scientists from the Linus Pauling Institute and College of Veterinary Medicine at Oregon State University, and the Department of Medicine at the University of Washington. They were just published in *Circulation*, a journal of the American Heart Association.

Heart disease is the leading cause of death in the United States.

The study found that lipoic acid supplements reduced atherosclerotic lesion formation in two types of mice that are widely used to study cardiovascular disease, by 55 percent and 40 percent, respectively. The supplements were also associated with almost 40 percent less body weight gain, and lower levels of triglycerides in very low-density lipoproteins.

As a result, the authors concluded that “lipoic acid may be a useful adjunct in the prevention and treatment of atherosclerotic vascular diseases.”

“We are excited about these results, particularly since the supplements of lipoic acid appear to provide several different mechanisms to improve cardiovascular health,” said Balz Frei, professor and director of the Linus Pauling Institute. “They are helping in a fundamental way to reset and normalize metabolic processes, in ways that could help address one of the most significant health problems in the Western world.

“These findings also reinforce the need for more comprehensive human studies,” Frei said. “That will be the next step in our research, in double-blind, randomized, clinical studies during the next five years with Oregon Health and Science University.”

Alpha lipoic acid is a naturally occurring nutrient found at low levels in green leafy vegetables, potatoes and meats, especially organ meats such as kidney, heart or liver. The amounts used in this research would not be obtainable by any normal diet, researchers said, and for human consumption might equate to supplements of about 2,000 milligrams per day. Even at low, normal, dietary levels, the compound can play a key role in energy metabolism.

Atherosclerosis, or what used to be called “hardening of the arteries,” is a long-term process that is now seen as a chronic inflammatory disease, which begins when certain types of white blood cells called monocytes bind to “adhesion molecules” on the walls of arteries. This in turn allows the monocytes to enter the arterial wall, there they become inflammatory macrophages that, in the presence of low density lipoprotein, or LDL, can transform into lipid-laden foam cells – ultimately, an arterial fat deposit.

This chronic process often begins during adolescence, can continue for a lifetime, and has been linked to obesity, poor diet, lack of exercise, diabetes, high blood pressure, genetic predisposition and other causes. The fatty deposits in arteries can ultimately trigger a heart attack or stroke.

Researchers now believe that high levels of alpha lipoic acid can be particularly useful in preventing this process, by inhibiting the formation of the adhesion molecules. It can also lower triglycerides, another important risk factor for cardiovascular disease. It may also function as an antioxidant, and helps to normalize insulin signaling and glucose metabolism.

“From what we understand, this supplement would be most valuable as a preventive mechanism before people have advanced cardiovascular disease,” Frei said. “However, it may help retard the process at any stage, and may also be of value in treating diabetic complications.”

Also of considerable interest, Frei said, is the apparent role of lipoic acid supplementation in reducing weight gain. It appears to have this effect both through appetite suppression, an enhanced metabolic rate, and – at least in laboratory animals – has been shown to stimulate higher levels of physical activity, which again would increase caloric expenditure and further reduce weight.

Mice given lipoic acid supplements simply chose to eat less than a control group that did not receive supplements, suggesting a reduced appetite. In another test, mice that received supplements gained less weight than other mice in a control group that were given identical amounts to eat, suggesting a higher metabolic rate and enhanced activity levels.

Weight gain and obesity is a major risk factor for atherosclerosis and

heart disease, and lower weight and abdominal fat may be one of the mechanisms by which lipoic acid has beneficial effects, Frei said. The study concluded that “lipoic acid supplementation may be a promising approach to prevent weight gain and to lower cardiovascular disease risk in humans.”

Although some of the most compelling research with lipoic acid research has been done in mouse models, scientists say, there should be a reasonable extrapolation to humans, because the lipoprotein profile is similar, as well as the composition of the atherosclerotic lesions. These mouse models are routinely used in studies of human atherosclerosis.

Source: Oregon State University

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