

DIETITIANS' NEWS

A Flax Lignan Complex Slows the Progression of Atherosclerosis in Hypercholesterolemic Rabbits

The main lignan in flax, secoisolariciresinol diglycoside (SDG), is an antioxidant¹⁻³ that can suppress the development of atherosclerosis in rabbits.⁴ What has not been known until now is whether SDG also slows the progression of atherosclerosis once it has become established in this animal model. A recent study found that a flax lignan complex containing SDG did just that: it slowed the progression of atherosclerosis by 31% in hypercholesterolemic rabbits.⁵

The study was carried out by Dr. Kailash Prasad at the University of Saskatchewan in Saskatchewan, Canada, who has studied the antioxidant properties of SDG for several years. In his most recent study, Dr. Prasad used the New Zealand white rabbit as the animal model. Animals were fed one of four diets: (1) regular laboratory rabbit chow (control); (2) a diet containing 0.25% cholesterol for 2 months; (3) a 0.25% cholesterol diet for 4 months; or (4) a 0.25% cholesterol for 2 months followed by a 0.25% cholesterol diet with added flax lignan complex (40 mg/kg/day body weight orally) for 2 months. At the end of the specified diet period, changes in the rabbits' aorta were assessed, along with changes in the aortic content of malondialdehyde (MDA), which is a measure of oxidative stress.

As expected, the development of atherosclerotic plaques increased significantly ($p < 0.05$) in the aortas of rabbits fed 0.25% cholesterol for 4 months (groups 3 and 4) compared with the control group, which showed no atherosclerotic changes. However, the extent of atherosclerosis was greater in the aortas of rabbits fed cholesterol for 4 months (group 3) than in the aortas of rabbits fed cholesterol with added flax lignan complex (group 4) – 76% vs 53%, respectively, a slow down in the progression of atherosclerotic lesions of 31% ($p < 0.05$). The MDA content of aortas was 42% lower ($p < 0.05$) in the rabbits fed the flax lignan complex (group 4) than in those of rabbits fed only cholesterol for 4 months (group 3).

Prasad concluded that the flax lignan complex was effective in slowing the progression of atherosclerotic lesions in rabbits fed cholesterol. Furthermore, the decrease in the aorta MDA content of rabbits fed a flax lignan complex suggested a normalization of the oxidative reserve in the aorta. In other words, the flax lignan complex decreased oxidative stress, which injures the lining of blood vessels and promotes the development of atherosclerosis.⁶

References

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