Blocking a muscle growth-limiting hormone protects against obesity and atherosclerosis

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Knockout of myostatin, a growth factor that limits muscle growth, can decrease body fat and promote resistance against developing atherosclerosis, or "hardening" of the arteries, according to a new study conducted in mice.

"Obesity increases the risk of atherosclerosis, which accounts for 75% of all cardiovascular events, such as heart attacks and strokes," said study co-author Shalender Bhasin, MD, professor of medicine at Boston University School of Medicine and chief of the Section of Endocrinology, Diabetes, and Nutrition at Boston Medical Center. "Current strategies aimed at preventing heart disease consist primarily of lowering cholesterol levels, but patients reaching the desired cholesterol levels are still at risk for atherosclerosis if they have other risk factors, such as obesity."

Humans and animals with a mutation in the myostatin gene are extremely muscular and have little fat, past research shows. Also, when the gene encoding myostatin is knocked out in mice, their muscle mass increases.

Bhasin and his co-workers wanted to find out if inhibiting myostatin in mice could resist the development of diet-induced obesity and of atherosclerosis, the buildup of lipid deposits called plaque that can narrow and clog coronary arteries.

The researchers took mice that were genetically altered to develop

atherosclerosis and then cross-bred them with myostatin knockout mice. Ten generations later, they had mice who were genetically predisposed to both atherosclerosis and inactivation of myostatin. For controls, they studied mice with a genetic predisposition for atherosclerosis but with intact myostatin gene. All mice received a high-fat diet for 12 weeks, to spur the development of atherosclerosis.

Compared with controls, the mice with deleted myostatin gene had much less body fat and 30 percent lower fasting blood sugar and 80% lower fasting insulin levels, showing a reduction in obesity and a strong resistance to developing diabetes, the authors reported. They also had 50 percent lower low-density-lipoprotein ("bad") cholesterol and 30 to 60 percent lower levels of total cholesterol and triglycerides (fats in the blood), respectively. These results indicate protection against the development of atherosclerosis, according to Bhasin.

More research is needed to demonstrate the safety and effectiveness of myostatin inhibitors in humans, Bhasin said. However, he said that that this therapeutic strategy already is possible. Experimental drugs called myostatin blockers or inhibitors are being studied as potential treatments of muscle wasting disorders and limb injuries.

Some currently available nutritional supplements are touted as myostatin inhibitors, but Bhasin said he doubts they are effective.

Source: The Endocrine Society (news : web)