

Experiments show blood pressure drugs could help fight frailty

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University of Texas Medical Branch at Galveston researchers believe they've found a way to use widely available blood pressure drugs to fight the muscular weakness that normally accompanies aging.

The discovery draws on research linking the loss of muscle mass with age-related changes in the behavior of the hair-thin blood vessels, or capillaries, which supply muscles with the [amino acids](#) they need for growth.

"When a young person eats food, [insulin secretion](#) causes the blood vessels in the muscle to dilate, so a lot of blood goes into the muscle and a lot of amino acids are available to build muscle proteins," said UTMB professor Elena Volpi, senior author of a paper on the work ("Pharmacological vasodilation improves insulin-stimulated muscle protein anabolism but not glucose utilization in older adults") now available in the "Online Ahead of Print" section of the journal *Diabetes*. "Older people's blood vessels have far less response to insulin, but we found that if you give them a drug that causes them to dilate, you can increase the nutritive flow to the muscles and completely restore normal growth."

Drugs that induce [blood vessels](#) to widen, called vasodilators, are commonly used to control [high blood pressure](#) and prevent angina. The UTMB study used sodium nitroprusside, a drug used in hospitals and administered intravenously.

The researchers enrolled 12 healthy older volunteers for the study, and separated them randomly into two six-person groups. Working in UTMB's Clinical Research Center, the investigators performed the delicate task of inserting catheters into the arteries and veins feeding and draining the subjects' leg muscles, and then used the arterial catheter to infuse the muscles with insulin at levels similar to those generated by a meal. One group of volunteers was given the vasodilator drug, while the other received a placebo.

Blood sample and muscle biopsy analysis produced estimates of muscle protein synthesis and breakdown. The results were impressive: virtually normal [muscle growth](#) in the older subjects given the vasodilator with insulin.

"By giving them this vasodilator, we were able to make our 70-year-olds look like 30-year-olds, at least in terms of muscle growth," said postdoctoral fellow Kyle Timmerman, a lead author of the paper. The study was co-led by medical student and graduate research fellow Jessica Lee.

While the researchers cautioned that larger studies would be needed to confirm their findings, they expressed optimism about vasodilator drugs' potential as tools for keeping older people from falling into frailty, and living happier, healthier and more independent lives.

"If by improving blood flow during and immediately after eating we can improve muscle growth in response to meals in older people, then we're going to have a major new tool to reduce muscle loss with aging," Volpi said. "By itself, that could mean a substantially decreased risk of physical dysfunction and disability."

Provided by University of Texas Medical Branch at Galveston

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