Dangerous blood pressure increases during exercise can be blocked: research

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UT Southwestern Medical Center researchers have identified one reason people with hypertension experience an even greater increase in their blood pressure when they exercise, and they've learned how to prevent the rise.

A study in a March issue of the *Journal of Physiology* reported that hypertensive people who exercise undergo decreased blood flow and oxygen in muscles. The scientists also identified a specific type of blood pressure medication that minimizes this effect.

"While there are many hypertension medications effective at lowering blood pressure at rest, very few are effective during exercise," said Dr. Wanpen Vongpatanasin, associate professor of internal medicine at UT Southwestern and lead author of the study. "People with high blood pressure need to exercise not only to help their blood pressure, but also their overall cardiovascular health."

Dr. Vongpatanasin said that some people with high blood pressure stop exercising out of fear of heart attack or stroke, and that sometimes physicians counsel those patients to limit activity because of those concerns.

While it's been known that blood pressure increases during exercise in people with hypertension, a mechanism behind the action and a way to block it in humans hadn't been identified previously.

Dr. Vongpatanasin and colleagues had 13 participants with mild hypertension and 13 with normal blood pressure perform hand grip exercises under regular conditions, followed by activity under conditions that affect a part of the nervous system that controls blood pressure.

They found increased nerve activity in hypertensive participants during exercise but not in those with normal blood pressure. Blood flow and oxygen levels in the arm muscles also fell more rapidly in the hypertensive group.

"In normal people, the body can increase blood flow to the working muscle despite increase in nerve activity, which tends to cause blood vessels to constrict," Dr. Vongpatanasin said. "Hypertensive patients have increased nerves and impaired ability to maintain muscle blood flow adequately."

Researchers then treated study participants with two types of blood pressure medications. An angiotensin receptor blocker, which prevents the hormone angiotensin from increasing blood pressure, increased blood flow during exercise. A diuretic that reduces blood pressure by stimulating sodium loss did not.

"Since nerve increases weren't reduced during treatment, we believe the angiotensin receptor blocker works directly on blood vessels to improve blood flow," Dr. Vongpatanasin said.

The next step, she said, will be to see if other hormones associated with angiotensin are involved in similar responses.

Provided by UT Southwestern Medical Center