

Researchers discover important link between adrenal gland hormone and brain in hypertension

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A hormone already responsible for increasing blood pressure by prompting the kidneys to retain salt appears to moonlight as a major stimulator of the brain centers that control the vascular system and blood pressure.

Researchers at UT Southwestern Medical Center studied patients who overproduce aldosterone to see whether the hormone had any effect on sympathetic [nerve activity](#) responsible for blood pressure increases.

"Between 10 percent and 20 percent of patients with high blood pressure who are resistant to treatment have elevated aldosterone hormones," said Dr. Wanpen Vongpatanasin, associate professor of internal medicine at UT Southwestern and senior author of the study in the October issue of the [Journal of Clinical Endocrinology & Metabolism](#). "Previous studies in animals showed that this hormone can affect many parts of the brain that control the cardiovascular system. We wanted to understand whether aldosterone also increases the nerve activity that causes constriction of blood vessels, which elevates blood pressure in humans.

"Since aldosterone can cause high blood pressure by affecting multiple systems and not just the kidneys, this study sheds light on why blood pressure is so difficult to control in patients with high aldosterone levels."

Aldosterone is an essential hormone that regulates electrolytes in the body. Created by the adrenal glands, it is responsible for re-absorption of sodium and water into the bloodstream and for regulating potassium. High levels of aldosterone can cause [high blood pressure](#), muscle cramps and weakness.

Dr. Vongpatanasin and her team studied 14 hypertensive patients who overproduced aldosterone, a condition known as primary aldosteronism, and compared them with 20 hypertensive patients and 18 patients with normal blood pressure.

The data showed that in humans, aldosterone does increase activity in a part of the nervous system that raises blood pressure. Such activity contributes to the onset of hypertension. Furthermore, when the nerve activity was measured in patients who had adrenal surgery to remove tumors that produced this [hormone](#), both nerve activity and blood pressure decreased substantially.

"Our study also suggested that treatment of hypertension in these patients not only requires targeting the kidneys but also the sympathetic nervous system that controls [blood pressure](#)," Dr. Vongpatanasin said. "Since our study shows that patients with high aldosterone levels have high nerve activity, future studies are needed to determine how we could prevent effects of aldosterone on the brain."

Provided by UT Southwestern Medical Center

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