

# Common hypertension drugs can raise blood pressure in certain patients

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(PhysOrg.com) -- Commonly prescribed drugs used to lower blood pressure can actually have the opposite effect -- raising blood pressure in a statistically significant percentage of patients. A new study by researchers at Albert Einstein College of Medicine of Yeshiva University suggests that doctors could avoid this problem -- and select drugs most suitable for their patients -- by measuring blood levels of the enzyme renin through a blood test that is becoming more widely available. The study appears in the August online edition of the *American Journal of Hypertension*.

“Our findings suggest that physicians should use renin levels to predict the most appropriate first drug for treating patients with hypertension,” says lead author Michael Alderman, M.D., professor of epidemiology & population health and of medicine at Einstein. “This would increase the likelihood of achieving blood pressure control and reduce the need for patients to take additional antihypertensive medications.”

The study involved 945 patients who were enrolled in a workplace antihypertensive treatment program in New York City from 1981 to 1998. All had a systolic blood pressure (SBP) of at least 140 mmHg. SBP, the top number in the blood pressure reading, represents the amount of force that blood exerts on the walls of blood vessels when the heart contracts. No patients were receiving treatment for high blood pressure before enrolling in the study.

The patients were given a single antihypertensive medication, either a

diuretic or a calcium channel blocker (so-called “V” drugs, which lower blood volume) or a beta blocker or an ACE inhibitor (“R” drugs, which lower levels of renin, an enzyme secreted by the kidneys that plays a key role in maintaining blood pressure).

Plasma renin activity (PRA) and SBP were measured at enrollment, and SBP was measured again after one to three months of treatment. The renin level predicted those patients who were most likely to have a favorable response with either an R or a V drug. In addition, for both R and V drugs, the renin test was able to identify those patients most likely to experience a “pressor response” -- a clinically significant increase in SBP of 10 mmHg or more.

Over all, 7.7 percent of the patients exhibited a pressor response. The highest percentage of pressor responses -- 16 percent -- occurred in patients with low renin levels who were given a beta blocker or an ACE inhibitor (R drugs).

“Every clinician knows that there’s a variation in response to antihypertensive treatment, and that some patients will have an elevation in blood pressure,” says Dr. Alderman, a former president of the American Society of Hypertension. “The latter phenomenon is generally attributed to patients’ failure to take their medications or to a random event. But these data show that it’s not a random event -- it’s due to a mismatch between the patients’ renin status and the drug. We think it makes sense to use renin to predict the most appropriate treatment.”

Dr. Alderman says that two groups of patients might especially benefit from having their renin levels measured: patients being prescribed antihypertensive drugs for the first time and patients who are taking multiple antihypertensive drugs when one or two might work just as well. “With renin testing, you will more often get [blood pressure](#) under control with less therapy,” he adds.

PRA testing has long been used to help determine the underlying cause of a patient's hypertension (i.e. whether it's due to constricted blood vessels or too much blood volume, or both), which can help guide therapy. "The problem was that the test was expensive and difficult to perform accurately," says Dr. Alderman. "However, the methodology for measuring PRA is getting better and the test is becoming more widely available."

In an accompanying editorial, Morris J. Brown, M.D., professor of clinical pharmacology at the University of Cambridge School of Medicine in England, wrote, "The role of renin measurement may be to detect the extremes, and to reach rational treatment in those not controlled by standard combination [drug therapy]. Many hormones are measured on rather less reason and evidence than plasma renin, the 'oldest' of them all; its place in routine management of [hypertension](#) has at last arrived."

**More information:** The study, "Pressor Responses to Antihypertensive Drug Types," appears in the August online edition of the *American Journal of Hypertension*.

Provided by Albert Einstein College of Medicine

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