

Genetic profile guides search for the right blood pressure drug

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We are swimming in a sea of options when it comes to treating high blood pressure; there are currently more than half a dozen different classes of drugs on the market for the condition. Yet there is little rationale for giving individuals one particular drug over another.

Now, using a combination of key genes, researchers have developed a genetic profile that can identify at least one quarter of patients that react positively to the blood pressure drug rostaduroxin.

The findings may help doctors avoid the trial-and-error process commonly associated with matching the right blood pressure drug to the right patient.

Additionally, the “personalized medicine” platform may help to identify patients genetically predisposed to develop complications from certain blood pressure drugs. When blood exerts too much pressure on the walls of blood vessels, it's called hypertension, or [high blood pressure](#). In 90 to 95 percent of hypertension cases the cause is unknown; but there are a few factors known to worsen high blood pressure, including smoking, obesity, consuming high amounts of salt, and stress.

Here, Chiara Lanzani, along with Mara Ferrandi and colleagues found that two factors--variants of the Adducin family of [genes](#) and high levels of hormone ouabain--are related to high blood pressure. Specifically, both mechanisms abnormally activate the sodium pump, a protein deployed to control body sodium and blood pressure.

Yet the increase in blood pressure caused by excessive sodium pump activation can be inhibited by the drug rosetafuroxin at very low doses, the authors found. Next, in a phase II clinical trial, the team treated hypertension patients with rosetafuroxin, and found that patients carrying particular genetic profile (made up of certain combinations of gene variants) responded positively to the drug, but not to other antihypertensive drugs.

The results indicate that the [genetic profile](#) created by the researchers was able to predict the effectiveness of rosetafuroxin (but not that of any other antihypertensive drugs) in patients carrying key gene variants.

Since the mechanisms blocked by rosetafuroxin also underlie high blood pressure-related organ damage, this drug may also reduce risk of heart attack or other cardiovascular problems in patients, beyond that typically expected from reduced blood pressure alone.

More information:

-- "Adducin- and Ouabain-Related Gene Variants Predict the Antihypertensive Activity of Rostafuroxin. Part 1: Experimental Studies," by M. Ferrandi et al., *Science Translational Medicine*.

-- "Adducin- and Ouabain-Related Gene Variants Predict the Antihypertensive Activity of Rostafuroxin. Part 2: Clinical Studies," by C. Lanzani et al. *Science Translational Medicine*.

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