

New study confirms link between weight loss and blood pressure for individuals with specific genetic polymorphisms

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Your genetic makeup can help determine how well your body will respond to weight loss efforts aimed at controlling high blood pressure, a new study confirms.

The multi-institutional study, led by researchers at The Cardiovascular Institute, part of the University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School, may help clarify how hypertension develops and progresses in certain individuals and also identify people for whom [weight loss](#) programs are most likely to help reduce blood pressure. Results were published in the current issue of *Hypertension*.

The Trial of Nonpharmacologic Interventions in the Elderly (TONE) looked at 21 polymorphisms that have been identified as relating to hypertension, obesity, and diabetes mellitus to see what impact weight loss and sodium-reduction programs would have on blood pressure. Polymorphisms are the elements of a person's DNA that make it different from another's and allow for diversity in such varied areas as eye color, hair texture, and even blood type. The TONE study identified several polymorphisms that relate to weight sensitivity with regard to hypertension, according to principal investigator John B. Kostis, MD, John G. Detwiler professor of cardiology, professor of medicine and pharmacology, associate dean for cardiovascular research, and director of The Cardiovascular Institute of Robert Wood Johnson Medical

School.

The study sheds some light on an issue that has received little attention in the past, the researchers said.

"There are more than a thousand papers discussing the question of what the impact is on blood pressure of decreasing the amount of salt you consume in your diet—what is called salt sensitivity. But, there is nobody talking about weight sensitivity, and weight loss is equally or more important in controlling blood pressure," Dr. Kostis said.

"Our work describes the variability of blood pressure drop in response to weight loss, according to a number of [genetic polymorphisms](#)," added William J. Kostis, PhD, MD, clinical and research fellow in medicine, Massachusetts General Hospital, Cardiology Division, alumnus of Robert Wood Johnson Medical School, and member of The Cardiovascular Institute, who was the first author of the study.

Participants in the TONE study—individuals age 60 to 80 who were already taking one or two anti-hypertensive medications—were randomly assigned to one of four interventions:

- Intensive dietary intervention focused on sodium reduction
- Weight loss program
- Combination of weight loss and sodium-reduction programs
- Attention control, in which individuals attended meetings that discussed dentistry, podiatry, or other topics unrelated to hypertension, weight loss, or sodium reduction

Regardless of the intervention, participants' levels of anti-hypertensive medication remained the same throughout, to remove medication changes as a variable.

"The study showed that both weight loss, if individuals are overweight, and decreased sodium intake may each lead to lower blood pressure, and the combination of weight loss and sodium restriction is more effective than either strategy alone," noted Dr. William Kostis.

Physicians can put these findings to use today through a blood test or even saliva test that measures genotype, Dr. John Kostis said. They can compare the patient's genetic background with the polymorphisms that have been identified in the study and counsel patients accordingly, offering advice as to which type of intervention may be more successful in lowering that patient's blood pressure, he said.

"With genomic studies becoming more widespread and less expensive, evaluating weight sensitivity may be one way to identify individuals who may benefit more from weight loss, as compared with other types of lifestyle interventions, like cutting salt from their diet," Dr. William Kostis said.

"Analysis of the polymorphisms also may give an indication of how much of a drop in [blood pressure](#) a person should expect, if he or she were to lose a given amount of weight," Dr. John Kostis added.

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