

Thiazide may pose some risk for congestive heart failure patients

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Thiazide, a popular diuretic for lowering high blood pressure, may not excrete salt as expected in patients with congestive heart failure and or dehydration and should be taken with caution, say researchers at the University of Cincinnati.

A study led by Manoocher Soleimani, MD, James F. Heady Professor of Medicine and associate chair of research in the Department of Internal Medicine at UC, looked at thiazide use in experimental mouse models and was presented today at a meeting of the American Society of Nephrology's Kidney Week activities in San Diego.

"In genetically engineered mouse models lacking the kidney target of thiazides, our studies show that thiazide is able to decrease the [blood pressure](#) only if the animals are on a [salt](#)-restricted diet," says Soleimani, also a UC Health physician. "In animals that are not on [salt restriction](#), the effect of thiazides on salt excretion and blood pressure is very mild. This latter is due to the activation of molecules in the kidney that blunt the diuretic effect of thiazides.

"Several recent studies have shown that in humans, the anti-hypertensive effects of thiazides are enhanced if those subjects are on a salt-restricted diet. Our studies demonstrate that salt restriction shifts the anti-hypertensive mechanism of thiazides from diuresis (salt excretion) to a vasorelaxation (relaxing the arteries)," says Soleimani.

"One group of patients taking thiazides are patients with fluid overload

due to congestive [heart failure](#) who are prone to volume depletion (dehydration) due to a number of factors," he explains. "Our studies suggest that those patients should be very cautious with taking thiazide since it can drop the blood pressure and reduce blood flow to the kidney and the brain and cause dizziness without increasing salt excretion."

Soleimani says volume depletion in patients with [congestive heart failure](#) should be corrected before physicians prescribe a thiazide derivate. Otherwise, physicians should consider switching the patient to another medication, he explains.

Thiazide derivatives are among the most commonly used blood pressure medications worldwide, says Soleimani. About 70 million Americans—or one in every three adults—have [high blood pressure](#), according to the Centers for Disease Control and Prevention.

Researchers used genetically engineered mouse models, lacking the target molecules for thiazides as well as animals lacking counterbalancing molecules in the kidney, says Soleimani. The models included four different groups of mice determined by salt-restrictive or normal diets.

Blood pressure in the transgenic animals was measured by a computerized tail cuff technique and cardiac function was measured by cardiac echocardiography in collaboration with researcher Jack Rubenstein, MD, an associate professor in the UC Division of Cardiovascular Health and Disease and a member of the UC Heart, Lung and Vascular Institute.

Provided by University of Cincinnati Academic Health Center

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