BP Drop When Rising Linked to Heart Failure

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Orthostatic hypotension predicted a significant 46% elevated risk of developing heart failure over about 18 years of follow-up, an observational analysis found.

The association was stronger among those 55 and younger, with a heart failure hazard ratio of 1.90 compared with 1.37 for those older than 55 (*P*=0.034 for age interaction), Christine DeLong Jones, MD, of the University of North Carolina at Chapel Hill, and colleagues reported online in *Hypertension*.

"Orthostatic hypotension preceding heart failure may be a marker of early subclinical atherosclerosis that is facilitated by hypertension and potentially by other risk factors to contribute to heart failure development," the group speculated.

Normally, a number of mechanisms work together to prevent a big dip in blood pressure when standing up, they explained.

Action Points

In this study, orthostatic hypotension predicted a significant 46% elevated risk of developing heart failure over about 18 years of follow-up.

Note that the exact mechanism by which orthostatic hypotension precedes heart failure isn't clear.

The carotid baroreceptor response boosts sympathetic activity and cuts parasympathetic activity, which spurs catecholamine release, vasoconstriction, and increased heart rate.

Atherosclerosis could be the culprit that throws off these compensatory responses, Jones' group suggested, although they cautioned that the exact mechanism for orthostatic hypotension that precedes heart failure isn't clear.

"Furthermore, because many conditions, including hypertension, diabetes mellitus, and coronary heart disease, are associated with both orthostatic hypotension and heart failure, such competing factors may facilitate the association," they wrote.

Early identification of individuals at risk for heart failure is critical to aggressively tackle those contributing, modifiable factors, the group noted.

They analyzed results from the ongoing, longitudinal, population-based Atherosclerosis Risk in Communities study, which included 12,363 adults initially free of heart failure whose blood pressure had been measured at baseline both supine and standing.

A difference of at least 20 mm Hg systolic pressure or 10 mm Hg diastolic pressure with that position change was threefold more common among the 1,720 participants who developed incident heart failure than among those who didn't (11% versus 4%).

After adjustment for potential confounding factors, the link remained significant at a heart failure hazard ratio of 1.54 (95% CI 1.30 to 1.82).

Excluding individuals with the heart failure risk factors of diabetes and heart disease at baseline did little to change the association, which was similar across sex and races.

But excluding the large group with hypertension at baseline did attenuate the link between heart failure and orthostatic hypotension to borderline significance (HR 1.34, 95% CI 1.00 to 1.80).

That may have been partly related to loss of statistical power but wasn't likely to be the result of antihypertensive medications because a sensitivity analysis excluding those taking ACE inhibitors, beta-blockers, or diuretics didn't do much to the risk estimates, the researchers noted.

"The attenuation may suggest that hypertension and orthostatic hypotension could contribute to incident heart failure through a similar pathway, such as through recumbent hypertension," they suggested, noting that supine blood pressure averaged 22 mm Hg higher with orthostatic hypotension at baseline.

"However, it is important to note that adjusting for supine blood pressure in our overall adjusted model did not eliminate the association between orthostatic hypotension and heart failure," they added.

The major limitation of the analysis was the need to define heart failure by self-reported treatment at baseline and by hospitalization or death certificate disease codes during follow-up because heart failure wasn't an outcome built into the study design.

Other problems were lack of orthostatic hypotension evaluation during follow-up and lack of echocardiographic assessments for heart failure.

The ARIC study was supported by contracts from the National Heart, Lung and Blood Institute.

The researchers reported having no conflicts of interest to disclose.

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Jones CD, et al "Orthostatic hypotension as a risk factor for incident heart failure: the Atherosclerosis Risk in Communities Study" *Hypertension* 2012; DOI: 10.1161/HYPERTENSIONAHA.111.188151.

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