

Differences in cell response could explain higher rates of hypertension in African-Americans

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A key difference in the way that cells from African-Americans respond to inflammation could be an answer to why this group is disproportionately affected by hypertension, something that has eluded scientists for many years.

In a study published this month in *Vascular Health and [Risk Management](#)*, lead author Michael Brown and his team tested the effects of TNF- α , a protein that causes inflammation when [cells](#) are damaged, on endothelial cells – which line blood vessels – in both African-Americans and Caucasians, to determine whether the inflammation affected the cells differently.

Among African-American cells, there was a nearly 90 percent increase in the production of endothelial microparticles, small vesicles that are released during inflammation. Individuals with [hypertension](#) have been shown to have higher levels of these microparticles in their bloodstream. Among Caucasians, there was only an eight percent increase in their production.

Brown said that although follow-up research needed to be done, "it appears that the endothelial cells in African Americans are more susceptible to the damaging effects of this inflammation." Brown is the director of the Hypertension Molecular and Applied Physiology Laboratory at Temple's College of Health Professions and Social Work.

Brown's research is unique in that it focuses on studying risk of hypertension at the cellular level; most research focuses on the clinical or physiological aspect. For more than 10 years, Brown has been trying to unlock the genetic reason behind the higher rates of hypertension and cardiovascular disease among African Americans.

Brown's research includes an exercise component, to test whether physical activity can reverse or prevent the damage done by hypertension at the cellular level.

"In our human study we have pre-hypertensive [African-Americans](#), and we find this level of endothelial impairment. Knowing so early how [inflammation](#) can affect cells means we can be at a place to intervene before they go on to develop hypertension," said Brown. "That intervention could be lifestyle modification, diet and exercise to improve vascular health."

Other authors on this study are Deborah Fearheller, Sunny Thakkar, Praveen Veerabhadrapa and Joon-Young Park of the department of kinesiology. Funding for this study was provided by the National Heart Lung and Blood Institute at the National Institutes of Health.

Provided by Temple University

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