

Blood pressure research addresses differences

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(Medical Xpress) -- A UT Arlington researcher's recent work may hold clues as to why hypertension is more severe and strikes earlier in the African-American population.

David Keller, an assistant professor of kinesiology and associate director of UT Arlington's Center for Health Living and Longevity, has found differences in the way that African Americans and Caucasians respond to simulated <u>hypertension</u>. When tested, African-American men in his study showed a blunted ability to reflexively adjust their <u>heart</u> rates in response to short-term hypertension

Keller is studying arterial baroreflex function in African Americans at rest and during exercise as part of a project funded by the National Institutes of Health National Heart, Lung and Blood Institute. Results of the first phase of his work were recently published in the *American Journal of Physiology: Heart and Circulatory Physiology,* in an article called "Carotid baroreflex responsiveness is impaired in normotensive African American men."

More than 40 percent of non-Hispanic blacks have high blood pressure, also known as hypertension, according to the American Heart Association. The rate of hypertension in the general population is one in three. The condition can lead to heart disease or stroke. Additionally, African Americans are at nearly double the risk of fatal stroke related to hypertension and are more than four times more likely to develop endstage renal disease associated with hypertension than Caucasians.



"While some lifestyle factors are known predictors, there remains much that we must understand about the way in which the disease develops and factors that contribute to its development," said Carolyn Cason, interim vice president for research at UT Arlington. "Research like that being done by Dr. Keller is key to establishing the scientific foundation upon which new, successful treatments can be built."

Co-authors on the study were former UT Arlington graduate students Seth Holwerda and Diana Fulton, as well as Wendy Eubank-Holden, currently a postdoctoral research associate at UT Health Science Center in Fort Worth.

"The Center for Healthy Living and Longevity is very focused on addressing serious health issues that affect the community here in North Texas and across the U.S.," said Lou Fincher, chairwoman of the kinesiology department at UT Arlington. "David Keller's research allows students to participate in work that could one day help everyone know more about their risks for developing hypertension."

The arterial baroreflex is the primary short-term regulator of arterial blood pressure. The baroreflex receptors, or "sensors" are located in the large blood vessels in the neck and the aorta. The reflex works with the brain to monitor blood pressure levels and increase or decrease blood supply based on the needs of the body.

Keller and his co-authors selected 30 men, ages 18 to 33, for their study, half of who were Caucasian and half of who were African American. None of the study participants had a history of either hypertension (high blood pressure) or hypotension (low blood pressure). During the experiments, researchers simulated both conditions with pressure or suction applied to the participants' necks for short periods of time.

The team monitored the participants' heart rates and mean arterial



pressure, which is the pressure across the walls of their arteries.

"At rest ability to control blood pressure was not markedly different, but the ability to reflexively control the heart rate was different, especially in simulated hypertension," Keller said. "This seems to reflect something inherently different about short term <u>blood pressure</u> regulation. We believe those differences may persist and could be involved in the long term regulation and could help to explain the increased incidence of hypertension in African Americans."

Keller would like to explore what role the vagus nerve, which regulates heart rate, plays in these racial differences. Next, he plans to study participants' responses to the same experiments while they are exercising.

Keller was recently asked to participate in an *American Journal of Physiology* podcast about his work. It is available here: ajpheart.podbean.com/2011/11/0 ... frican-american-men/.

Provided by University of Texas at Arlington

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