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Research uncovers new sex-specific factor in CV disease

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A common receptor may serve differentiated roles related to aging-associated cardiovascular disease (CV) in males and females. Jennifer DuPont, Ph.D., will present the findings of this first-of-its-kind study today at the American Physiological Society (APS) Aldosterone and ENaC in Health and Disease: The Kidney and Beyond Conference in Estes Park, Colo.

Mineralocorticoid receptors (MRs) in the kidney classically help the body balance salt and fluid levels to contribute to blood pressure control. They are also found in a number of different tissues throughout the body, including the blood vessels, heart and digestive tract. Drugs inhibiting MR function are used to treat cardiovascular disease, especially heart failure.

To study the role of MRs in aging, researchers used mice lacking the gene that encodes for MRs in smooth muscle cells (i.e., "knock-out mice"). Smooth muscle cells are present in tissues such as blood vessels, bladder and digestive tract. It is distinct from striated muscle, which is found in the heart and skeletal muscle. The mice still had MRs in their kidneys and heart but lacked them in the smooth muscle cell layer of their blood vessels.

The researchers compared the male and female knock-out mice with male and female control mice at 3, 12 and 18 months. These time points correspond to youth, middle age and old age. Out of five measures of cardiovascular aging, four appeared in control males at 12 months, but

not until 18 months for control females. Two of the measures were prevented or reduced in the knock-out males only. One measure was reduced in knock-out females only, and two others improved outcomes for both sexes of knock-out mice.

These findings "suggest complex physiological relationships between [smooth muscle cell mineralocorticoid receptors], sex and aging-associated cardiovascular disease," DuPont says. "Our findings also emphasize that cardiovascular aging and the time course of [cardiovascular disease] development are different between men and women, and this mouse model gives us a foundation to further explore these mechanistic sex differences that will allow us to identify sex-specific therapeutic strategies to improve CVD outcomes in the aging population."

Jennifer DuPont, Ph.D., of Tufts Medical Center in Boston, will present "Sex differences in the role of the smooth muscle cell mineralocorticoid receptor in cardiovascular aging" in the symposium "MR in the vasculature" on Saturday, October 5, at the Stanley Hotel.

More information: www.the-aps.org/professional-d … he-kidney-and-beyond

Provided by American Physiological Society