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Research shows drug can extend survival rates for heart failure patients

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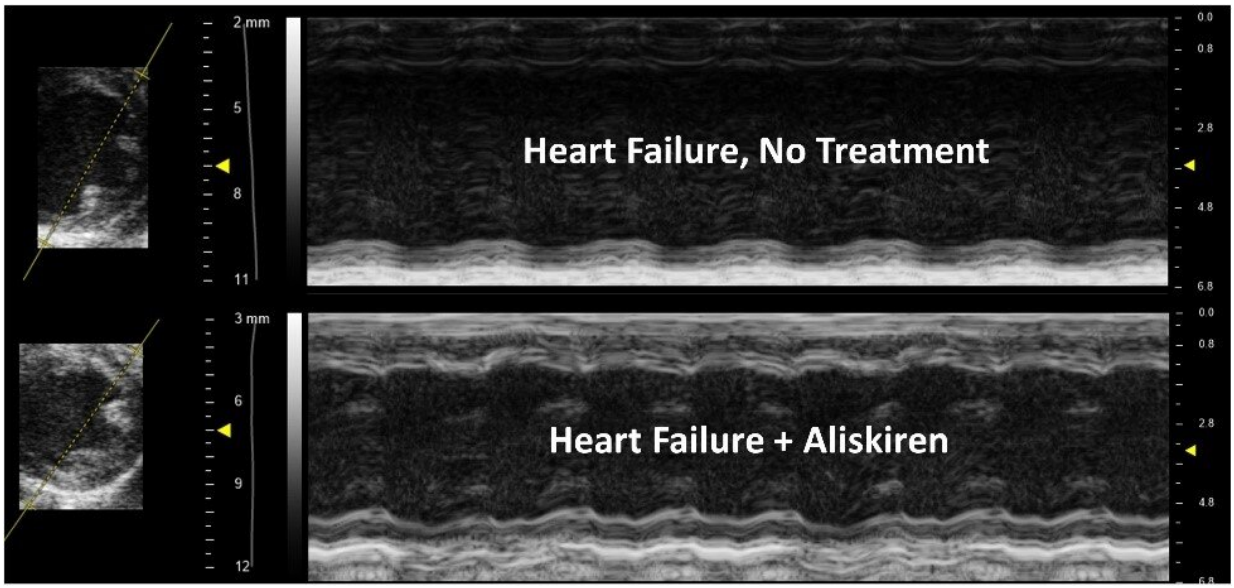

The treated image shows improved contractility of the heart, less ventricle/chamber dilation and improvement in wall thickness compared to the untreated heart. Credit: UA College of Medicine -- Phoenix

Researchers at the University of Arizona College of Medicine—Phoenix have shown for the first time in preclinical studies that Aliskiren, a drug that inhibits the enzyme that regulates blood pressure, can delay the progression of congestive heart failure and lengthen survival rates.

More than 5 million Americans live with congestive heart failure, a

chronic progressive condition that occurs when the heart muscle doesn't pump blood as well as it should.

"This FDA-approved drug has the potential to improve the quality and extend the life in properly identified heart failure patients," said Ryan Sullivan, DVM, assistant professor in the college's Department of Internal Medicine and lead author of the study, "Normalizing Plasma Renin Activity in Experimental Dilated Cardiomyopathy: Effects on Edema, Cachexia, and Survival," published in the August 2019 edition of the *International Journal of Molecular Sciences*, as part of a Special Issue Heart Failure: From Molecular Basis to Therapy.

"That's an extra 5.6 years with loved ones that otherwise would not be possible. Obviously, further studies are needed, along with human clinical trials, but we are excited about our research direction and what those outcomes could mean for the college and the people of Arizona and beyond."

The Cardiovascular Disease Research group from the UA College of Medicine—Phoenix Department of Internal Medicine used a new technology to evaluate changes in muscle mass and fluid retention over time in heart failure. Using this noninvasive technology, they showed that Aliskiren blocked muscle loss, prevented fluid retention and saved lives.

"Heart failure is a rapidly increasing cause of disability and death," Dr. Sullivan said. "Patients suffer from progressive muscle wasting and fluid retention, which leads to discomfort, shortness of breath and fatigue. There is a need to better measure muscle wasting and fluid retention to identify effective methods for treatment and prevention. These exciting findings demonstrate new approaches that may guide future care for heart failure patients."

Edema and muscle wasting occur during the progression of heart failure and neither is always clinically evident.

One of the major challenges in heart failure management is detecting and reproducibly quantifying edema and muscle mass over time in response to interventions that treat breathlessness, clinical symptoms of heart failure and cardiac cachexia, which is unintentional severe weight loss associated with heart failure.

The team identified and implemented the technology known as QMR (quantitative magnetic resonance) as a method to objectively measure edema development longitudinally throughout the disease progression. In addition, the device captures changes in body fat and lean muscle mass, which are associated with poor prognosis in heart failure patients.

This technology has potential applications in monitoring and adjusting individual treatment protocols by using a precision medicine approach for clinical heart failure patients.

More information: Ryan D. Sullivan et al, Normalizing Plasma Renin Activity in Experimental Dilated Cardiomyopathy: Effects on Edema, Cachexia, and Survival, *International Journal of Molecular Sciences* (2019). DOI: 10.3390/ijms20163886

Provided by University of Arizona

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