A blood test could help identify those at highest risk of dying from heart failure, study finds

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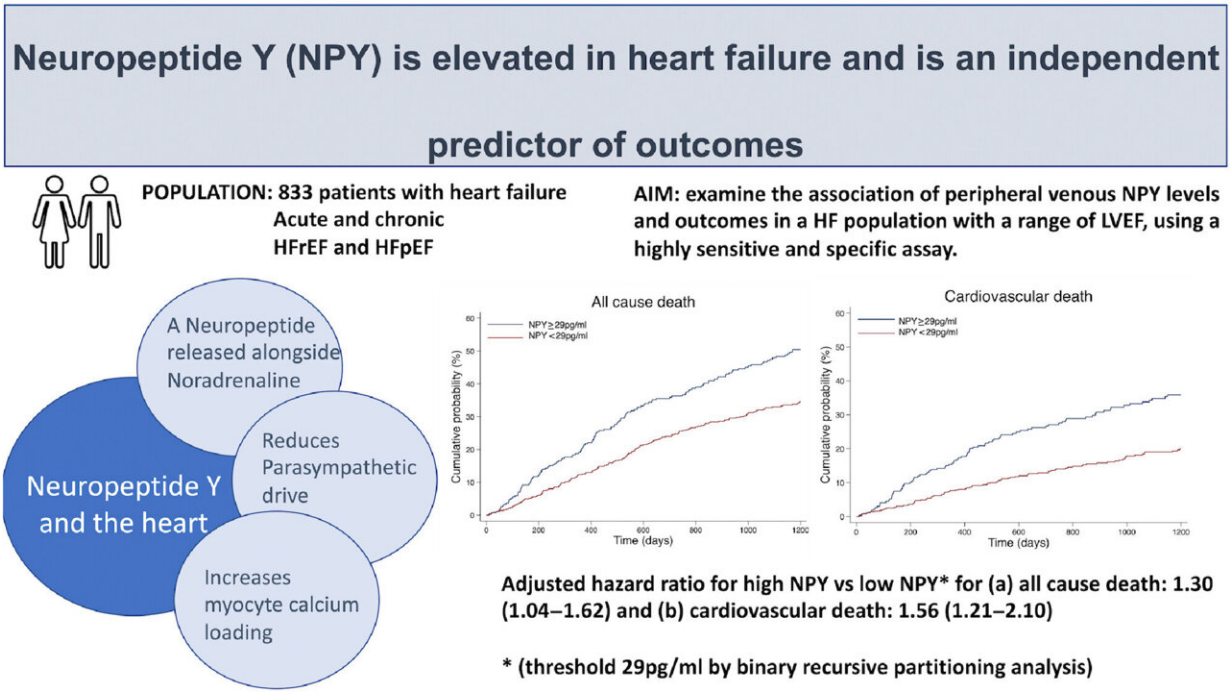

Credit: *European Journal of Heart Failure* (2023). DOI: 10.1002/ejhf.3085

A blood test could help identify those at highest risk of dying from heart failure, new research has found. The study found that patients with highest levels of a protein called neuropeptide Y (NPY) were 50% more likely to die from a heart complication over the three years that the

research was conducted, compared to those with lower levels.

Testing for NPY could help predict how heart failure is likely to progress, and researchers hope that a blood test could be used to help guide treatment for heart failure patients within five years.

Heart failure occurs when the heart can't pump blood around the body as well as it should. It is a life-limiting condition resulting in frequent hospital visits and reduced quality of life and there is currently no cure. It is currently estimated that there are more than 1 million people living with heart failure in the U.K., and about 200,000 new cases are diagnosed in the U.K. each year.

NPY is released by nerves in the heart in response to extreme stress. It can trigger potentially dangerous heart rhythms and causes constriction of the smallest blood vessels in the heart muscle, making the heart work harder and causes blood vessels going to the heart to contract.

The new research, published in the *European Journal of Heart Failure*, was led by Professor Neil Herring, Professor of Cardiovascular Medicine and Consultant Cardiologist at the University of Oxford in collaboration with Professor Pardeep Jhund at the University of Glasgow.

Data from more than 800 participants at different stages of heart failure were used, and participants were measured for levels of the hormone B-Type Natriuretic Peptide (BNP), a hormone currently used to diagnose heart failure.

Participants' blood pressure and echocardiograms—a type of ultrasound heart scan—were also taken and were followed up regularly. Researchers adjusted for known factors that can influence how heart failure progresses, including age, kidney function, how well the heart pumps

and BNP levels. Patients with high levels of NPY, who made up about a third of the study participants, had 50% higher risk of dying over the three year follow up period from a heart complication compared to those with lower levels.

Participants who had high NPY levels were not admitted to hospital any more frequently during the study than other groups. Researchers suggest that this could be because NPY may be linked to abnormal heart rhythms which could be resulting in out-of-hospital cardiac arrests.

The researchers suggest that measuring NPY alongside BNP could help diagnose heart failure patients, pinpointing those who may be at higher risk of dying. Identifying those at greatest risk early on could also help health care professionals decide the best course of treatment for their patients, helping spot those who may benefit from having a potentially lifesaving Implantable cardioverter defibrillator (ICD) fitted. The team hopes that a blood test for NPY could be used in clinics within five years

Next, the researchers hope to carry out larger trials using data from patients with very high levels of NPY, to see whether it can accurately identify those who may benefit from having a potentially lifesaving Implantable cardioverter defibrillator (ICD).

Further research will also explore whether NPY could in future be used as a chemical for drugs to target and bring further benefit to heart patients drug target.

Professor Pardeep Jhund, Professor of Cardiology and Epidemiology at the University of Glasgow's School of Cardiovascular and Metabolic Health, said, "Patients with heart failure are still at a high risk of dying despite the advances in treatment. Our work shows that NPY is a promising marker that can be measured in the blood to determine which patients are more likely to die. We hope that this will allow us to identify

patients who may benefit from new therapies."

Professor Bryan Williams, Chief Scientific and Medical Officer at the British Heart Foundation says, "As many as 1 million people in the U.K. have heart failure and around 200,000 new cases are diagnosed every year. This new research suggests that a new, cheap and simple blood test, could help us in future to more accurately spot which patients with heart failure are at highest risk of early death.

"Measuring neuropeptide Y levels could in future offer health care professionals greater insights into how a patient's heart failure is likely to progress, in particular whether those with high levels of neuropeptide Y would benefit from additional treatment to reduce their higher risk. It is only through funding lifesaving research like this that we can continue to push the boundaries and ensure that people with heart failure receive the best and most suitable treatment to help them live well."

Professor Neil Herring, professor of cardiovascular medicine and consultant cardiologist at the University of Oxford says, "The findings of this research are an exciting new development, building on over 10 years of collaborative research on this stress hormone.

"We hope our research will ultimately benefit the increasing number of patients who are living with the debilitating effects of heart failure daily. Next, we will investigate whether measuring for very high levels neuropeptide Y could influence whether patients can get lifesaving treatment like ICDs before the blood test can be rolled out within five years."

More information: Kirsty McDowell et al, Neuropeptide Y is elevated in heart failure and is an independent predictor of outcomes, *European*

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