

Discovery could speed up heart failure and pneumonia diagnosis

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(Medical Xpress)—University of Otago researchers have discovered a potential new tool to help doctors in emergency departments quickly and accurately diagnose patients with heart failure and pneumonia.

Associate Professor Chris Pemberton and colleagues at the University's Christchurch Heart Institute have found that the molecule ghrelin [signal peptide](#) (GHRsp) could be used to signal if patients have concomitant heart failure and pneumonia.

The study, funded by the Health Research Council of New Zealand, is the first in the world to identify the presence of GHRsp in the human [circulation system](#), and the first to highlight its potential significance in cardiovascular disease and infection.

In an initial study of 500 people presenting to Christchurch Hospital, the Otago team set out to discover if GHRsp could help with the diagnoses of patients arriving in emergency departments with chest pain similar to [acute coronary syndromes](#) (ACS) such as a [heart attack](#) or [unstable angina](#).

"The rapid diagnosis and treatment of people who present with ACS is one of the biggest concerns hospitals face, especially emergency departments," says Dr Pemberton. "It takes a lot of time and resources to diagnose those with suspicious [chest pain](#), and it's incredibly stressful for the patients. Only about one-third of them will be diagnosed with genuine ACS."

Currently, the gold standard biomarker for diagnosing heart attacks is to measure the amount of the protein troponin in patients' blood. A problem with this is that newer, more sensitive forms of the test produce many false positives; up to 25 per cent of people who have elevated levels of troponin in their blood aren't actually having a heart attack.

The Christchurch study aimed to see if GHRsp could be used in conjunction with troponin to filter out these false positives.

Although GHRsp still produced too many false positives, ruling it out as a tool for diagnosing ACS, Dr Pemberton was surprised when the results revealed that GHRsp had the potential to detect patients with concomitant heart failure and pneumonia.

"At this stage we're not sure why GHRsp appears to be a biomarker for both heart failure and pneumonia; however, we suspect that the release of GHRsp is primarily led by inflammation, which is present in both conditions," says Dr Pemberton.

The gold standard [biomarker](#) for diagnosing acute heart failure in the emergency setting is B-type natriuretic peptide (BNP). With this discovery, doctors could potentially also help diagnose people who present with both heart failure and pneumonia.

"If BNP is negative and GHRsp is high, the patients may be more likely to have pneumonia. If it's the other way around, where BNP is positive and GHRsp is low, this may indicate heart failure without pneumonia. If they're both positive, however, the patient could have heart failure and underlying pneumonia."

It's important to know if a patient has ACS, heart failure and/or pneumonia because the treatments for these conditions are very different. In particular, there's a real need for biomarkers for pneumonia

because the other methods for diagnosis, such as chest x-rays, aren't always clear, and if a patient has pneumonia with concomitant heart failure, they need treatments for both conditions introduced.

"If what we've managed to discover here is reproduced in a larger set of studies, it has the potential to help doctors get a better handle on patients who present with acute [heart failure](#) with or without pneumonia. Vital to this will also be the development of our assay into a rapid, usable format to which end we are also in talks with interested industry providers."

Provided by University of Otago

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