

# Amyloid scan of the heart predicts major cardiac events

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Amyloid build-up is commonly talked about in relation to Alzheimer's disease, but amyloidosis can be found throughout the body. An excessive accumulation of these insoluble proteins could cause a heart attack or even death. A new molecular imaging scan of amyloid in the heart could help diagnose the problem, say researchers at the 2015 annual meeting of the Society of Nuclear Medicine and Molecular Imaging (SNMMI).

The condition is called transthyretin-type (TTR) amyloidosis after the TTR gene thought to cause the over-abundance of plaque build-up. In time, amyloidosis of the [heart](#) can lead to hypertension, an enlarged heart, an abnormal heartbeat and [chronic heart failure](#). A [molecular imaging](#) method that can assess amyloid in the heart could prevent future heart attacks and potentially save lives. For this study, researchers are evaluating a molecular imaging procedure called myocardial scintigraphy that involves the injection of a radionuclide imaging agent that binds to these accumulations in the heart. The radiotracer, known as technetium-99m hydroxymethylene diphosphonate (Tc-99m HMDP), is widely available and typically used to image bone, but recent studies have indicated its potential usefulness to detect cardiac amyloidosis.

'To our knowledge, this is the first study revealing the prognostic value of Tc-99m HMDP myocardial scintigraphy in [patients](#) with TTR amyloidosis,' said Axel Van Der Gucht, lead author of the study and a [nuclear medicine](#) physician at Henri Mondor Hospital in Créteil, France. 'Given the clinical, diagnostic and therapeutic potential of Tc-99m HMDP myocardial scintigraphy based on these results, all patients with

suspected cardiac amyloidosis should undergo a minimally invasive scan as a standard of clinical evaluation.'

A total of 55 patients out of 121 evaluated for TTR amyloidosis were diagnosed and included in the study. All 55 participants underwent both whole-body and cardiac Tc-99m HMDP scintigraphy at 10 minutes and three hours after injection. The results showed that 47 out of 55 patients were positive for cardiac amyloidosis. Three main types of amyloidosis were assessed: monoclonal light chain (AL), wild-type transthyretin (wt-TTR), and mutated transthyretin (m-TTR). Of the 47 patients diagnosed with amyloidosis, 21 had wt-TTR cardiac amyloidosis and 26 had m-TTR cardiac amyloidosis.

Scans were evaluated both visually and using quantitative analysis by observing the heart-to-skull ratio of imaging agent retention. Heart-to-skull retention was linked to levels of cardiac amyloidosis. Patients with a lower heart-to-skull score experienced a better rate of survival, free of major cardiac events, at six months (95 percent survival) than those who had a greater score (60 percent survival). Researchers were able to split patients into prognostic categories when heart-to-skull ratios were combined with New York Heart Association (NYHA) classifications.

With further validation, this widely available molecular imaging procedure could become the standard of care for the evaluation of cardiac amyloidosis.

**More information:** Scientific Paper 27: "99mTc HMDP myocardial scintigraphy is predictive of major adverse cardiac event (MACE) in patients with transthyretin-type (TTR) amyloidosis"

Provided by Society of Nuclear Medicine

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