Urine screening test may one day predict coronary artery disease

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Proteome analysis, a screening requiring only a patient's urine specimen, shows promise as a reliable and noninvasive way to diagnose atherosclerosis and coronary artery disease in the future, according to research presented at the American Heart Association's Arteriosclerosis, Thrombosis and Vascular Biology Annual Conference 2009.

Coronary angiography, an X-ray examination of the blood vessels or chambers of the heart, is the traditional way to diagnose atherosclerosis. To perform this procedure, clinicians insert a small tube, or catheter, into a blood vessel in the groin area or arm and thread the catheter to the coronary arteries of the heart.

"Atherosclerotic disease results in heart attack and stroke, which have major impacts on life and health in the Western world," said Constantin von zur Muehlen, M.D., the study's lead author and cardiologist at the University Hospital Freiburg, Department of Cardiology in Freiburg, Germany. "We conducted this study to find new biomarkers for atherosclerosis and determine whether this noninvasive screening could reliably recognize this disease."

Proteome analysis shows protein patterns in body fluids, such as blood or urine, Muehlen said. Using two techniques to analyze specimens (mass spectrometry and capillary electrophoresis), scientists can simultaneously characterize thousands of proteins in one examination.

Muehlen and colleagues determined that certain protein fragments can

only be found in coronary artery disease patients, and this patient group established the proteome pattern. The 17 protein fragments that the researchers identified as being associated with atherosclerotic disease were collagen fragments, known to be present on the surface of atherosclerotic plaques.

The researchers then applied the proteome pattern in another group of patients with atherosclerotic disease of the coronary arteries. The investigators compared the results of the urine proteome screenings from 67 patients presenting with symptoms of coronary artery disease to patients' results from coronary angiography, the current gold standard used to rule out or confirm coronary artery disease.

"The accuracy of the urine proteome pattern to identify coronary artery disease was 84 percent," Muehlen said.

Larger studies will be needed to confirm the findings of this study before proteome analysis can be used as a reliable screening method in patients, Muehlen said. "However, our data suggest that proteome analysis shows great promise. It is easy to use, shows a high reproducibility and does not hurt."

Source: American Heart Association (news : web)