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Researchers identify new protein markers that may improve understanding of heart disease

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Researchers at the Intermountain Medical Center Heart Institute in Murray, Utah, have discovered that elevated levels of two recently identified proteins in the body are inflammatory markers and indicators of the presence of cardiovascular disease.

These newly identified markers of inflammation, GlycA and GlycB, have the potential to contribute to better understanding of the inflammatory origins of heart disease and may be used in the future to identify a heart patient's future risk of suffering a heart attack, stroke, or even death.

Inflammation occurs in the body in response to tissue damage, irritation, or infection. Inflammation is often associated with injury (i.e., sprained ankle), infection (i.e., strep throat), and auto-immune diseases (i.e., rheumatoid arthritis). However, it has been shown that inflammation is also a risk factor for heart disease.

"There are at least two benefits evident from this study," said J. Brent Muhlestein, MD, lead researcher and co-director of cardiovascular research at the Intermountain Medical Center Heart Institute. "First, a new marker of heart attack or stroke may help us to more effectively identify which patients are at risk. Second, now that we know GlycA and GlycB are important predictors of heart disease, we'll seek to understand more about the physiology of these proteins – what causes them to

increase and how we can we treat elevated levels."

Levels of GlycA and GlycB were determined from a blood test called nuclear magnetic resonance (NMR) spectroscopy, which was developed to determine the number of lipid particles contained in different cholesterol parameters.

Testing for GlycA and GlycB by NMR spectroscopy uses signals that arise from the binding of glucose molecules to a variety of circulating inflammatory proteins, especially fibrinogen, α1-antichymotrypsin, haptoglobin-1, α1-antitrypsin, complement C3 and α1-acid glycoprotein.

Like C-reactive protein, one of the most well-known and studied inflammatory markers shown to be associated with cardiovascular disease, GlycA and GlycB are acute phase proteins with plasma concentrations that increase or decrease in response to changes in the levels of inflammation throughout the body.

This is one of the first studies ever to evaluate the association of GlycA and GlycB to cardiovascular disease. In this study, almost 3,000 patients who underwent heart catheterization to determine the presence of coronary artery disease with a minimum of five years of follow-up were evaluated.

Of the 48 percent of heart patients who died, suffered a heart attack, stroke, or heart failure during follow-up, the majority had significantly higher baseline levels of GlycA and GlycB. Specifically, those with levels in the top 25 percent were more than 30 percent more likely to have an adverse cardiovascular event compared to those with levels in the lowest 25 percent, even after other risk factors were taken into account.

"The next step will be to determine how GycA and GlycB correlate with,

or are independent of, other common inflammatory markers like C-reactive protein," said Dr. Muhlestein.

Provided by Intermountain Medical Center