

New Test May Predict Heart Disease Events and the Effect of Weight Loss on Insulin Resistance

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(PhysOrg.com) -- Chemical fingerprints produced by the body's normal metabolic processes predict who will suffer cardiovascular events and who will benefit from weight loss by reduction of insulin resistance, according to two new studies by researchers at Duke University Medical Center.

In one study, the Duke researchers found markers that may indicate which patients would have a [heart attack](#) or die within an average of three years. In a second study, newly discovered markers appeared to predict if insulin resistance, a precursor to [type 2 diabetes](#), would improve with moderate weight loss.

Both studies use the tools of a rapidly growing scientific field known as metabolomics, which measures metabolites, or cellular “waste,” in the blood.

“While this work is preliminary, data from these studies has the potential to provide clinicians with powerful information to tailor treatment to an individual,” said [cardiologist](#) and study team leader Svati Shah, MD, who reported the findings today at the American Heart Association’s Scientific Sessions 2009.

While genes can help determine risk for developing a disease during one’s lifetime, they do not change over time.

Metabolites, on the other hand, can be thought of as the end product of the interaction between genes, environment, and behaviors like diet and exercise. They provide a real-time assessment of cellular activity and potentially provide more specific measures of risk.

In the first study, researchers analyzed blood samples from 2,000 people undergoing an evaluation for [coronary artery disease](#). Follow up was conducted for three years on average.

Researchers found metabolic signatures, or clusters of metabolites with interrelated functions, that were present in higher levels in the blood of people who later went on to have a heart attack or die.

Shah said the new study builds upon previous research in smaller groups of patients which associated the same metabolites with death or heart attack, and found they were hereditary in families with heart disease.

Researchers are planning future studies to explore why these metabolic signatures appear to predict cardiovascular disease and undercover what genes may be playing a role.

In the second study, the researchers randomly selected 500 people who had lost at least eight pounds during a randomized clinical trial of weight loss interventions, the Weight Loss Maintenance (WLM) study.

Blood samples were analyzed when patients enrolled in the study and again six months after weight loss. Researchers found that people with higher levels of a different set of metabolic signatures in their blood at enrollment had improved insulin resistance, regardless of how much weight they lost.

“While insulin resistance typically improves with weight loss, not everyone sees the same results, so our study suggests that we can predict

who will benefit from moderate weight loss to try and enhance that effect,” Shah said.

“On the other hand, if a person will not have health benefits from [weight loss](#), we could explore other interventions and at an earlier stage.”

Shah said the next step is to understand what is happening on a molecular level that may be affected by a behavior change; this can also lead to the development of targeted treatments that address the underlying problem.

The metabolites identified in the new study had been associated with the development of insulin resistance in previous animal studies. These metabolites, called branched-chain amino acids, may not only predict [insulin resistance](#) but also may be contributing to the cause.

The researchers caution that further research is needed to validate whether the metabolic signatures identified in both studies have the potential to predict future events when used in clinical practice.

Provided by Duke University Medical Center ([news](#) : [web](#))

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