Common test could help predict early death in diabetes, study shows

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New findings out of Wake Forest Baptist Medical Center reveal that a common test may be useful in predicting early death in individuals with diabetes.

The study appears in the May issue of Diabetes Care.

"People with diabetes are already at high risk of developing heart disease and experiencing an early death," said Donald W. Bowden, Ph.D., the director of the Center for Diabetes Research at Wake Forest Baptist and lead investigator. "With this study, we've discovered that we can identify a subset of individuals within this high risk group who are at even higher risk, and the means to do this is already widely available in the form of a computed tomography (CT) scan – a relatively inexpensive and non-invasive test."

More than 25 million Americans – 8.3 percent of the population – are currently living with diabetes, according to the National Institutes of Health. People with the condition are at increased risk of developing heart and vascular disease and, while vascular disease is common in the general population, it is twice as common in people with diabetes. At least 60 percent of diabetes patients – even those on dialysis for kidney failure – ultimately die of a vascular event, such as heart attack or stroke. However, Bowden said, questions about why so many diabetes patients die early have remained unanswered in the medical community's understanding of the disease.

For the Diabetes Heart Study, Bowden and colleagues have been following nearly 1,500 patients with diabetes in North Carolina for about 13 years, gathering data on various aspects of the disease and how it affects individual health. As original study participants began to die, the researchers sought to understand why.

"When we reviewed the data last year, we were shocked by the number of participants who had already died during this study," Bowden said. "We wanted to find out if there were any predictors of who would succumb versus those who are still living. In a group of people who are already at high risk, we were looking for a way to identify which individuals were at even higher risk for early death, with the goal of finding interventions or ways to focus medical care and attention toward those individuals at highest risk."

A high coronary artery calcium (CAC) score is known to be a strong indicator of coronary heart disease. The score provides a measure of how much coronary artery disease, or calcified "plaque" is present in the blood vessels of the heart. Plaque plays a major role in heart attacks and other vascular events and can be measured by taking a special "gated" CT scan which, in comparison to typical CT scans, uses very few X-rays, does not require any injections and generally takes less than 10 minutes to perform. At Wake Forest Baptist, the test costs just over $200 and some insurance companies will cover the exam in appropriate situations.

Within the diabetes-affected population, there is a very wide range of calcified plaque buildup in the arteries and the heart, from individuals with none at all, to people whose entire vessels are nearly completely calcified. The researchers separated more than 1,000 study participants into five groups, according to the amount of calcified plaque they had in their blood vessels at the beginning of the study. The health of those participants was then followed for an average of 7.4 years before researchers compared the data from those who died during the study to

those who are still living.

"We saw a dramatic risk of dying earlier in the people with highest levels of calcified plaque in their blood vessels," Bowden said. "When comparing the group with the highest amount of plaque to the group that had the lowest amount of calcified plaque, the risk of dying was more than six times greater in the group with high levels of calcified plaque. The difference in risk that we revealed is striking. It's in a group of people who are already at risk, but the CAC level really rather dramatically differentiates risk between people within this high risk group. This finding could have novel clinical implications."

Diabetes is associated with many other medical problems, Bowden said, so identifying a way to determine who is at highest risk and who needs the most intensive medical monitoring and care is especially important.

"The striking magnitude of the risk suggests very strongly that other research samples should be evaluated, especially in individuals with diabetes," he said.

Provided by Wake Forest Baptist Medical Center

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