

Standard test for blood sugar control not accurate in diabetic dialysis patients

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The standard test for measuring blood sugar control in people with diabetes is not accurate in those on kidney hemodialysis, according to new research at Wake Forest University Baptist Medical Center.

Wake Forest investigators reported in *Kidney International* that the hemoglobin A1c test (HbA1c) underestimates true glucose control in hemodialysis patients and could give false comfort to patients and physicians. Hemodialysis, in which blood is passed through an artificial kidney machine for cleansing, is used in cases of kidney failure.

“These results suggest that the nearly 200,000 diabetic hemodialysis patients in the United States who use this test may not be receiving optimal care for their blood sugar,” said Barry I. Freedman, M.D., senior author and a professor of internal medicine and nephrology.

Diabetic dialysis patients who believe their blood sugars are in the ideal range may still have unacceptably high blood sugars. “This was a surprise to the nephrology community,” said Freedman. “The test we’ve all come to accept as ‘the gold standard’ has proven to be inaccurate in this patient population.”

HbA1c measures the percentage of hemoglobin (a protein in red blood cells) that has reacted with glucose. This measure, also known as glycosylated hemoglobin, reflects blood sugar control over the previous 30-120 days.

This study evaluated 307 patients with diabetes – 258 with end-stage kidney disease on hemodialysis and 49 who did not have kidney failure. The researchers compared the standard HbA1c test with a newer test (glycated albumin, or GA) that measures the amount of blood sugar that has reacted with albumin, a protein in the plasma. The GA test reflects blood sugar control over the previous three to four weeks. Blood samples were also analyzed to determine recent blood sugar levels.

Compared to those without kidney failure, diabetic patients on hemodialysis had higher blood sugars and GA levels, despite paradoxically lower HbA1c results. The relationship between GA and HbA1c differed between diabetic dialysis patients and those without kidney disease, demonstrating that the HbA1c did not accurately reflect blood sugar control in those on hemodialysis.

Researchers believe the major reason for the discrepancy is that HbA1c depends on red blood cell survival and these cells don't live as long in hemodialysis patients. Most dialysis patients have anemia requiring treatment with medications that stimulate red blood cell production (erythropoietin).

The current study confirmed a report in Japanese patients and is the first to demonstrate the inaccuracy of the HbA1c in black and white dialysis patients. The Wake Forest researchers will soon determine whether these concerns also apply to patients on peritoneal dialysis and to people with kidney disease not yet on dialysis.

Controlling blood sugar is important because high levels are risk factors for developing hardening of the arteries (atherosclerosis) and lead to higher rates of kidney disease, heart attack, stroke, nerve damage and blindness. People with diabetes who undergo hemodialysis are at especially high risk. About one out of four diabetic dialysis patients (23 percent) in the U.S. will die from cardiovascular and infection

complications during their first year on dialysis, and only 31 percent survive five years.

“Control of blood sugar improves outcomes of diabetic patients, so accurate assessment is critical,” said Freedman. “This study supports the GA test as a more accurate measure of long-term blood sugar control among diabetic patients who are on hemodialysis.”

The GA test is not currently available in the United States. Freedman said that until it is available, doctors and patients should be aware that the HbA1c underestimates glucose control and is affected by both erythropoietin administration and the hemoglobin concentration.

Source: Wake Forest University Baptist Medical Center

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