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Association of 1,5-Anhydroglucitol with Diabetes and Microvascular Conditions

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Guest:
Dr. Elizabeth Selvin is Associate Professor of Epidemiology and Medicine at Johns Hopkins University.

Bob Barrett: This is a podcast from *Clinical Chemistry*, sponsored by the Department of Laboratory Medicine at Boston Children's Hospital. I am Bob Barrett.

Hemoglobin A1c is widely used to monitor glycemic control and is now recommended for use in the diagnosis of diabetes. Although hemoglobin A1c has high reliability compared to the oral glucose tolerance test, there are certain settings in which such testing may be problematic and there is a growing interest in alternative markers of hyperglycemia.

A paper in the November 2014 issue of *Clinical Chemistry* examined the use of 1,5-anhydroglucitol as a marker of hyperglycemia and its association with clinical outcomes.

The lead author of that study is Dr. Elizabeth Selvin, an Associate Professor of Epidemiology and Medicine at Johns Hopkins University. Her major research interest is the epidemiology of diabetes and cardiovascular disease and she is our guest in this podcast.

Doctor, your paper examines 1,5-anhydroglucitol and its association with clinical outcomes. Why were you interested in studying 1,5-anhydroglucitol in the first place?

Dr. Elizabeth Selvin: So 1,5-anhydroglucitol or 1,5-AG is a candidate biomarker for short-term glucose control. It reflects hyperglycemic excursions or extreme elevations in glucose in the blood. It's thought to represent elevations of glucose in the blood over the past one to two weeks. And although the assay for 1,5-AG is commercially available, there are few studies that link this assay to long-term clinical outcomes.

Bob Barrett: Why did you want to take this particular study published in *Clinical Chemistry*?

Dr. Elizabeth Selvin: Well, we were interested in understanding whether 1,5-anhydroglucitol was a marker of increased risk of important

complications of diabetes. We conducted the study to evaluate the association of 1,5-anhydroglucitol with the risk of retinopathy and with chronic kidney disease, and then we also characterized the association of 1,5-AG with the risk of future diabetes; is it a marker of future risk?

Bob Barrett: And were there any other markers of impaired glucose metabolism that you studied?

Dr. Elizabeth Selvin: So we compared 1,5-AG to hemoglobin A1c, a more glycated hemoglobin, which is the standard marker that's used to monitor glucose control in the setting of diabetes.

Bob Barrett: Doctor, your study was conducted in an important community-based population of adults, the Atherosclerosis Risk in Communities Study, or ARIC. Why did you want to perform this study in a general population like ARIC?

Dr. Elizabeth Selvin: That's a great question! By conducting this particular study within a community-based cohort, a general population, this enabled us to examine the association of 1,5-anhydroglucitol across the full range of hyperglycemia.

So our study included a broad mix of individuals; so people with diabetes, people without diabetes, people with good control of diabetes, people with poor diabetic control. And this is helpful because it allows us to draw conclusions about how 1,5-anhydroglucitol performs in the general population of both people with and without diabetes.

Bob Barrett: Well, let's dig into it, what did you find in this investigation?

Dr. Elizabeth Selvin: We found that 1,5-AG helped identify people at risk for future diabetes and was also strongly associated with both the development of kidney disease and also the presence of retinopathy. And we found that especially in patients with poorly controlled diabetes, 1,5-anhydroglucitol values help to predict poor outcome.

Bob Barrett: That's pretty interesting! Finally, can you tell us, do these strong associations mean that 1,5-anhydroglucitol might be a useful clinical laboratory test in persons with diabetes or even pre-diabetes?

Dr. Elizabeth Selvin: That's an open question. Our results provide some evidence that 1,5-AG may complement existing tests, like hemoglobin A1c, so it may be a very useful biomarker of hyperglycemia in certain circumstances. But I do think we need more studies to fully evaluate the usefulness of this test in both research studies and also possibly its use in diabetes management.

Bob Barrett: Dr. Elizabeth Selvin is Associate Professor of Epidemiology and Medicine at Johns Hopkins University. She has been our guest in this podcast from *Clinical Chemistry* on anhydroglucitol and diabetes.

I am Bob Barrett. Thanks for listening!