Clinical Chemistry

Associations of Alternative Markers of Glycemia with Hemoglobin A_{1c} and Fasting Glucose

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Guest:
Dr. Elizabeth Selvin is an Associate Professor at the Johns Hopkins School of Medicine and Bloomberg School of Public Health.

Bob Barrett: This is the podcast from *Clinical Chemistry*. I am Bob Barrett.

Glucose in hemoglobin A1c measurements are important laboratory tests in the diagnosis and management of diabetes. Fasting blood glucose provides an accurate assessment of glycemia, while glycated hemoglobin reflects average glycemic exposure over the preceding two to three months.

But fructosamine, glycated albumin and 1,5-anhydroglucitol are alternative markers that are of increasing interest in both research and clinical practice.

In a paper published in the December 2012 issue of *Clinical Chemistry,* Dr. Elizabeth Selvin and her colleagues examined these alternative markers of glycemia. Dr. Selvin is an Associate Professor at the Johns Hopkins School of Medicine and Bloomberg School of Public Health. She joins us in this podcast.

Doctor, your paper examines three markers of hyperglycemia that are not commonly used in clinical practice. Could you tell us about each of these three markers and just why is it important to study alternative measures of hyperglycemia?

Dr. Selvin: So these are short term markers of hyperglycemia and they can be easily measured in serum and plasma, but it's unclear if they might be useful in a clinical setting. As you know, the standard measures of hyperglycemia that we use in diabetes care are typically fasting glucose and hemoglobin A1c.

So before we can really get a hand on the potential clinical usefulness of these non-traditional markers, we really need to know how they relate to the standard clinical measures.

Bob Barrett: So why did you undertake this study?

Dr. Selvin: So our goal was to describe the relationship of alternative markers of hyperglycemia, specially 1,5-anhydroglucitol, glycated albumin and fructosamine, to fasting glucose and hemoglobin A1c in a general population. And we also wanted to understand if these markers could identify people who had undiagnosed diabetes in our population.

Bob Barrett: Now the study was conducted in a community based population of adults, not just persons with diabetes. What did you find in your investigations?

Dr. Selvin: So that's exactly right. So we looked at a general population of both persons with and without diabetes and we found that 1,5-anhydroglucitol, glycated albumin and fructosamine were most strongly related to hemoglobin A1c, but they were also highly related to fasting glucose concentrations in the blood and in particular, fructosamine and glycated albumin were highly related to hemoglobin A1c levels.

Bob Barrett: So that means that fructosamine and glycated albumin might be useful in some settings when hemoglobin A1c is not available. You also mentioned that you looked at whether the serum markers of hyperglycemia might be able to identify cases of diabetes in the population. What did you find in relation to diabetes?

Dr. Selvin: So yes indeed, we found that both fructosamine and glycated albumin perform just as well as fasting glucose or hemoglobin A1c for identifying cases of diabetes in our population. And so this result really suggests that we might be able to use these measures to classify diabetes in studies where fasting glucose or hemoglobin A1c measurements are not available or might not be possible to conduct.

Bob Barrett: These are very interesting findings. Do these strong associations mean that these markers might be useful for monitoring glucose control in diabetes?

Dr. Selvin: Well, I really think that's an open question. We can't speak specifically to the overall clinical utility of these markers yet, but our study suggests that fructosamine and glycated albumin in particular, can accurately characterize hyperglycemia in the general population and could be useful for identifying cases of diabetes in studies where other standard measures are not available.

Bob Barrett: Well finally Dr. Selvin, let's look ahead. Can you tell us what you think are the next steps related to this study of these markers?

Dr. Selvin: One of the next steps that I think is very important is to figure out how these markers are related to clinical outcomes and whether they might have added utility for monitoring glycemic control in certain patient populations and people with diabetes.

Bob Barrett: Dr. Elizabeth Selvin is an Associate Professor at the Johns Hopkins School of Medicine and Bloomberg School of Public Health. She has been our guest in this podcast from *Clinical Chemistry*.

I am Bob Barrett. Thanks for listening.