

Transcript Details

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Discovering the Discordance Between Measured A1Cs & GMIs

Dr. Wysham:

You're listening to *Diabetes Discourse* on ReachMD. I'm Dr. Carol Wysham, and I recently had the chance to catch up with Dr. Irl Hirsch, a Professor in Diabetes Treatment and Teaching Chair at the University of Washington School of Medicine in Seattle, Washington. Here's Dr. Hirsch talking about a paper he recently co-authored that focuses on the relationship between measured A1Cs and average sensor glucose.

Dr. Hirsch:

This goes back to being interested in this topic for the last 20 plus years starting with finger stick glucose readings where I noted that there are some patients where the hemoglobin A1C from the lab never matched the kind of numbers I was seeing with the finger sticks and why was there so much discordance? So, that's point one. This has always been an interest of mine. Point number 2 is the fact that we have this new metric, it's not really new, with continuous glucose monitoring called GMI, which stands for "glucose management indicator". Now, the way this works and the first time this was done was back in 2008 was with our first continuous glucose monitor, you could look at somebody's glucose levels and see what equation could be put into that to then extrapolate that to hemoglobin A1C. So, a level of 154, for example, would be the same as a hemoglobin A1C of 7.0%. The problem with that 2008 paper is that these were people who had no anemia, no kidney disease, they had normal reticulocyte counts and I know a lot about that paper, which was funded by the American Diabetes Association because we were one of the eleven or twelve sites in that paper and in fact, I found, like 5% of my patients we had to kick out because they had reticulocyte counts about 5% and if red blood cell survival is the name of the game, we wanted to make this perfect hemoglobins. So, that's not real life. That's not my practice, that's not your practice, that's not any primary care provider's practice. So, what we did, was we looked at consecutive patients in our clinic over a couple of years, I guess, and what we found from this study was no surprise to me, but I think it was surprising to many people. We found that when we looked at the measured A1C from the laboratory and then we looked at the average glucose converted to the GMI, and we compared the GMI to the measured A1C, you would think that those two should be the same. They were only the same by 0.1% in 11% of patients. Only 11%. And if we then looked at discordance in this population of clinic patients to the University of Washington, what we found was that 0.5% off, so, at least 0.5% A1C units, so that means if the measured A1C was 7.0, the estimated A1C could be between 6.5 and 7.5, that's a 1% difference. Half of the population, 50% of our patients were in that bar and to me, what was again, not surprising to me, but if you take the patient with a measured A1C of 7%, how many of them were more than 1% off, so that could be an A1C between 6% or 8%? As it turned out, 22% of our patients were more than 1% off; 22% discordance. Now, this is important because if you have a patient who is not on continuous glucose monitoring, they're doing minimal if any finger stick testing and you are using that hemoglobin A1C to decide if you are gonna add a drug to their type 2 diabetes or maybe subtract a drug because the A1C is getting low and they're on a sulfonylurea, you need to make sure what that hemoglobin A1C means, because unless you have a CGM, you may not know that. From a practical point of view, what's very interesting is that many of us have used hemoglobin A1C as a way to tell a young woman she's ready for pregnancy. And I can tell you that this is, I think, one of the reasons why we have seen as many problems as we have is that we're using the A1C, which is nothing more than a biomarker instead of the actual glucose, which we can get with CGM. And maybe more of a selfish reason for some of us is that hemoglobin A1C is used as a treatment guide or a treatment metric if our patients are doing well and we are graded on that as physicians. And I think we're at a point, now, in 2021 with this hemoglobin A1C, which was new and wonderful in the 1980s, we need to now appreciate it was a biomarker, it's a crude biomarker, it has huge limitations, but it's a biomarker of glucose, which we can now measure very accurately and at the very least, my recommendation to primary care providers is, if you're gonna use your hemoglobin A1C for treatment decisions, I still think that's OK, but you need to know what that hemoglobin A1C level means. Does it read high, higher than the average glucose? Does it read lower? Or is it about, right? Because if you're gonna add or subtract drugs based on the A1C, you really do need to know what that means in terms of the blood sugar.

Dr. Wysham:

That was Dr. Irl Hirsch from the University of Washington School of Medicine. To hear my full conversation with Dr. Hirsch and to find other episodes in this series, please visit ReachMD.com/DiabetesDiscourse, where you can Be Part of the Knowledge. Thanks for listening!