

Ruth Adewuya, MD:

Hello. You're listening to Stanford Medcast, Stanford CME's podcast where we bring you insights from the world's leading physicians and scientists. If you're new here, consider subscribing to listen to more free episodes coming your way. I am your host, Dr. Ruth Adewuya. This episode is part of the COVID-19 miniseries addressing up-to-date insights on COVID-19. In today's conversation, I'm joined by Dr. Nicolas Cuttriss. Dr. Cuttriss serves as director of Project ECHO Diabetes at Stanford University. Prior to joining Stanford, Dr. Cuttriss served as the first pediatric endocrinologist for the University of New Mexico Project ECHO Institute. He has supported diabetes outreach initiatives in over 10 countries and has a special interest in telehealth, diabetes and supporting vulnerable and underserved diabetes communities in the United States and globally. Nick, thanks for chatting with me today.

Nicolas Cuttriss, MD:

Thanks so much for having me. Pleasure to be here.

Ruth Adewuya, MD:

Let's jump right into our discussion. I have read that most people with COVID-19 have comorbidities, and the most prevalent of them are diabetes, cardiovascular disease and hypertension. Since the initial COVID-19 outbreak in China, much attention has been focused on people with diabetes because of poor prognosis in those with infection. What is your perspective on the association between diabetes and susceptibility to novel coronavirus? Are there potential links between diabetes and COVID-19 infection?

Nicolas Cuttriss, MD:

Well, thanks Ruth. That's a complex question and there's kind of different types of risks, the risk of getting infection and kind of risk of what happens in terms of mortality and complications after getting infection. We're still trying to learn more from the evidence that's coming in but as far as we know right now, just having diabetes alone doesn't increase your risk for getting an infection. Then we're talking about diabetes, the two most common forms being type 1 and type 2... Type 2 being about 90%, type 1 being about 10%... people with type 1 diabetes, it's an autoimmune condition.

Now, many people with type 1 and families with type 1 are afraid that they're going to be more susceptible to getting COVID-19 because they have an autoimmune condition, but autoimmunity does not equal immunocompromised. And so that's kind of a caveat that I really start off with counseling families about on visits of asking them what their fears are about COVID and trying to share the most up-to-date evidence with them.

Now, if someone with diabetes were to get COVID, the risks of complications from COVID are greater and it seems to be it's most likely due to hyperglycemia. People who have hyperglycemia, whether they have diabetes or they don't have diabetes, are also at increased risk of having severity of disease from COVID. There was some data that came out from the NHS in the UK of looking at patients with diabetes who are hospitalized and looking at mortality rates. That was very scary for many patients, particularly type 1 where it showed the risk of mortality was three and a half times higher than the risk of people without diabetes, and the risk of mortality amongst people in the hospital with type 2 diabetes was double that.

That might be due to physicians and systems being able to manage insulin in a hospital and having increased hyperglycemia. So that's the risk amongst hospitalized patients in the UK. Initial data that came out from Wuhan, that we're also seeing now in the US, is that patients with hyperglycemia, uncontrolled diabetes are going to be at increased risk of complications. And it's really that age group,

older age group, or at least the data from the NHS and UK showed diabetes plus 40 years of age is the biggest risk factor. I'm a pediatric endocrinologist and thankfully in the pediatric population, we're not seeing mortality with type 1 diabetes.

Ruth Adewuya, MD:

Thank you for that. I think you answered a few of the followup questions that I actually had already, which was severity. It sounds to me what you're saying is that there's not necessarily a correlation between a person with diabetes and them being at risk of a severe version of COVID-19. Am I understanding that correctly?

Nicolas Cuttriss, MD:

Right. It's more of hyperglycemia causing severity of risk. From what we kind of hypothesizing right now, it has to do with the receptors for the virus and having an overlap with the receptors on the pancreas with specifically the ACE receptors.

Ruth Adewuya, MD:

One of the things that I read was a letter to The New England Journal of Medicine by a group of diabetes experts that said that there were some instances where COVID-19 positive patients were experiencing the onset of diabetes. Are you familiar with that information, and can you shed any light around that piece? If that were the case, how could that potentially happen? What would be the mechanism by which that would be happening?

Nicolas Cuttriss, MD:

So in terms of just type 1 diabetes in general, we still don't understand why people get type 1 diabetes, unfortunately. If you have identical twins and one of the twins has diabetes, it's only about a 50% risk that the other one will get it so there's something else going on in the environment, not just genetics, that triggers kind of stage three of type 1 diabetes where you go on to develop symptomatic disease.

There's global registries that are now being created to look at new onset diabetes and the association of having COVID. We've had a few patients who've recently been diagnosed with diabetes and they came back COVID positive as well, had several colleagues around the country with that and obviously from the article that you're citing, we're seeing that internationally as well. And so in terms of the etiology, we think it has to do with the ACE receptors on the pancreas in terms of how the virus attaches to them. As you know, the pancreas is involved in production of insulin. It's proposed, the hypothesis, there's some sort of mechanistic impairment in insulin production.

Ruth Adewuya, MD:

I'd like to discuss diabetes treatment and COVID. To frame that conversation, maybe just as a refresher, what are the blood glucose values that generally would lead to an initiation of antidiabetic therapy?

Nicolas Cuttriss, MD:

So in general, whether you have type 1 or type 2, the diagnosis of... Kind of the glucose threshold is the same so if you have a fasting blood sugar over 125, that's consistent with diabetes, or if you have a random blood sugar or a glucose tolerance test over 200, that's also diabetes. We also use a cutoff of 6.5 of a A1C so if an A1C is over 6.5, that's diabetes. If an A1C is under 6.5, it doesn't rule out diabetes,

though, because the A1C is just an average so you might have a normal kind of prediabetes range A1C when people are still having hyperglycemia.

Ruth Adewuya, MD:

And then in light of COVID and managing a COVID-19 patient that has diabetes, what are the implications of that for a clinician?

Nicolas Cuttriss, MD:

I think now is an era we're really trying just in general, even pre-COVID, trying to move beyond A1C metrics in diabetes care. And when I mean beyond A1C, we're talking about time and range. Time and range in general for diabetes is blood sugar between 70 and 180. If you're fasting, maybe between 70 and 140 or 70 and 150, and these targets can be individualized.

But we look at time and range, we look at time below range or... Hypoglycemia. We also look at kind of glucose variability. And now with continuous glucose monitors available, we're able to tell a lot more about beyond A1C by looking at data from CGM. So now in the time of COVID, having access to CGM and being able to see not only real-time data, but be able to see what's going on in terms of glucose, variability and minimizing hyperglycemia, it's just so important.

Ruth Adewuya, MD:

You brought up CGM, continuous glucose monitoring. Can you define what that is and also maybe in light of what flash glucose monitoring is? Is it being utilized for type 1 and type 2 diabetes?

Nicolas Cuttriss, MD:

Sure. So CGM stands for continuous glucose monitoring and there's kind of two types of them, flash CGM or flash continuous glucose monitoring, and integrated continuous glucose monitoring or iCGM. There's different brands out there on the market right now. The one that people are most familiar with most likely, the flash CGM, is the Libre. The Libre actually just came out with a new version yesterday called Libre 2 which is now iCGM.

And then for those of you who aren't familiar with kind of wearing the CGM, just to explain a little bit, so there's a patch or a sensor that you wear on the same types of subcutaneous tissue where a patient might inject their insulin... So their arms, the belly, their legs, the backside... and so there's the sensor and it sends a signal to a transmitter, and then the transmitter goes to your receiver. Usually, patients are using their phones as a receiver but if you don't have access to a phone, companies also provide a receiver that goes with a specific device.

And so the flash CGM by Libre, which is now the Libre 2 which is now going to be iCGM, before you would have to kind of take your phone or the device that comes with the Libre and you scan it over it with a wand and it tells you what your blood sugar is at that second, but it doesn't send you alerts versus the other kind of popular one on the market right now called the Dexcom. Not only does it tell you what your blood sugar is all the time, but it sends you alerts not only if your blood sugar is low, but it also tells you are you going to go low. It's predicting ahead of the time where you're going to be in the next 30 minutes so you can make decisions.

And so if you're about to go for a walk and you were do a blood glucose finger stick and your blood sugar's 150, you might not think twice. But if you look at your CGM and you see your blood sugar's 150 and you see a double arrow down because you just took an insulin and it's predicting you're going

to have a low in a half an hour, you're going to have a snack or you're going to bring a snack with you when you do your exercise and prevent a severe low blood sugar.

So it's really a game changer in diabetes management and an unbelievable tool to patients. You can imagine now in the time of COVID when patients are trying to be more hypervigil about blood sugar management and being able to have access to CGM to get reassurance that they're minimizing hyperglycemia as much as they can, but there's many barriers in terms of insurance for people having access to CGM.

Ruth Adewuya, MD:

I think that you would agree that the discussion of the social determinants of health is part of the management of diabetes. How has the pandemic changed that discussion, given that some folks have either lost their access to healthcare insurance because of the loss of their jobs? Has that impacted how clinicians or how you are having those conversations with your patients?

Nicolas Cuttriss, MD:

Yeah. Personally, in terms of the time I spend with my patients and kind of review of systems, I'd say the majority of it is spent towards social history and social determinants of health. So even if you're in a system where you have MAs who do patient check-in or you have the privilege of having social workers available in a clinic, many patients, they're not going to volunteer that they lost their job. They're not going to volunteer that they're having trouble with their medications. You ask them, "Do you have," when someone's doing a review of the medications, "have your insulin?" yes, but then when you ask more closely, well there's different types of insulin and maybe they're out of one type. They can't afford it because the copay's \$300.

And so really diving more into the social determinants of health, asking specifically about work, about living situations, that's just daily routine. I usually just start off, "What is your day like? Tell me what time are you waking up and going to bed." Just going through them explaining their day, you can really gain a lot of insight into the changes that COVID has caused.

Ruth Adewuya, MD:

Nick, I wanted to talk about maybe some of the implications for healthcare practitioners for the patients with diabetes. I understand that there were some consensus recommendations around COVID-19 and metabolic disease, specifically things that health practitioners should be aware of, whether it's outpatient or inpatient. Can you expand on those recommendations or talk through them?

Nicolas Cuttriss, MD:

Sure. I may think one, in terms of outpatient care, just general prevention, whether you have diabetes and metabolic disease or not, practicing mask wearing and having PPE and general prevention approaches to mitigating risks is of utmost importance. And then if you do have diabetes or [inaudible 00:13:47] disease, in terms of medication, optimizing whatever medications that you're currently on. There's misinformation going around and so people are thinking about stopping a medication. They really should speak to their provider about that. It's great to see people face-to-face, but if they don't have to come into the clinic, optimizing telemedicine as much as you can to mitigate potential additional risk exposure would be another thing to do in the outpatient setting.

And then with diabetes in particular, it's prevention and preparing for sick day management, and so really making sure patients with diabetes have a sick day management plan and they know what

to do. Specifically if you do get COVID, if you do get hyperglycemia, if you're on SGLT2 inhibitors, stopping that because that can exacerbate DKA. If you do get sick, sick day management plans of increasing your dose of insulin, usually, and making sure patients have access to that.

If patients do go into the hospital, now plans have kind of opened up the doors to allow CGM to be used in the hospital to more vigilantly manage blood glucose and ideally tracking ketones and aggressively treating hyperglycemia in the inpatient setting and really trying to maximize glucose control. I talked before in general, time and range goals are 70 to 180, and that's kind of still a general consensus, but maybe even tightening that even more to somewhere closer to 70 to 140.

Ruth Adewuya, MD:

If patients don't need to come into clinic or to the hospital, it sounds like that's preferred. So in that vein, how has COVID-19 impacted treatment facilities for patients with diabetes?

Nicolas Cuttriss, MD:

I think if there's one nugget out of this whole tragedy and pandemic, I think the healthcare system of delivery for people with diabetes... I'm hopeful that it'll improve and we can be more flexible with how we deliver care. Just backing up a little bit before I address it, even prior to COVID-19 we had system failure for people living with diabetes where outcomes were suboptimal. That's become even more apparent now and even more apparent in minority and underserved populations.

Prior to COVID, less than a third of patients were reaching A1C targets of an A1C less than 7%. But even more concerning is patients with diabetes, of over 191 million patients enrolled in health plans that report [inaudible 00:16:23] rates to the National Committee for Quality Assurance, 30 to 40% of patients with type 1 and type 2 diabetes had A1Cs over 9%. For the Medicaid population, it's 40% and for Medicare, 20% of A1Cs over nine of what is kind of "poor control", which is really a dirty word that I really don't like to use for patients because it's not patients' fault that they "have poor control" when only a third of people are meeting targets. This is system failure. It's a system failing people, not allowing them to achieve a glycemic target.

So now kind of going to what do you do, what do you tell patients in terms of the time of COVID, should you come into a visit, should you do telehealth, and I think it needs to be individualized, but now in terms of payment to providers, we can see patients in clinic and bill for the same amount of time that I would spend on telehealth. If I have families who live up in Humboldt County who spend a day driving down to see me when I don't really need to do a physical exam and I'm causing more burden on them to drive down every three months and they become once a year and utilize telehealth, why not do that? I'd rather one of my patients go play in a soccer game than wait half a day to see me in a clinic and do a visit after hours on telehealth. So hopefully, there's going to be more flexibility now in terms of where services can be rendered and where they can be delivered as well to patients.

And then there's also a digital divide, and many people don't have access to computers. They don't have access to cell phones and smartphones. And so for right now, we're able to do phone visits and those can be helpful, but some people also just want to come in in-person so we as a healthcare system need to make sure that we have the safest environment for patients, which we do here at Stanford, and practicing the best possible prevention so patients feel safe coming into clinic.

Ruth Adewuya, MD:

Nick, I'm at the end of my questions. I don't know if you had any nugget that you could share with healthcare professionals who are treating patients with diabetes from your experience, especially in this time of COVID.

Nicolas Cuttriss, MD:

There's no other condition like diabetes. It's a 24-hour, seven day a week job that you have no vacation for and you didn't sign up to do the job. People living with the condition... I don't have the condition so I can't say that I understand what it's like. I think as a tip, don't ever tell someone living with diabetes you understand it, particularly someone with type 1, if you don't live with the condition. Just prior to COVID, knowing and appreciating the complexity of living with diabetes and always thinking about the 40-plus factors that affect your blood sugar, for those taking insulin, and deciding what the dose is. If you dose too much, potentially having a severe hypoglycemia and possibly death, patients are thinking about that. They're thinking about potential long-term complications.

Now with COVID and the media and real science reporting that there's actually increased risk of mortality of patients with diabetes, people are distressed. With diabetes, there's a big overlap between depression and behavioral health. About 20 to 40% of people with diabetes have depression or kind of bouts of diabetes distress, and so you take someone who doesn't have diabetes and we talk about COVID and stress and depression, you put that on top of someone living with diabetes who's kind of already at risk for such high behavioral health comorbidities... And these are really challenging times for people, so I think really just being compassionate, understanding and, like I said earlier, in terms of your visits, really focusing on the social determinants of health and the context and, once again, not blaming the patient for hyperglycemia. There's no such thing as a good or bad blood sugar. You have highs, you have lows. Let's try to figure out how we can minimize your lows, minimize your highs and maximize your time and range and develop a partnership with your patients.

Ruth Adewuya, MD:

Fantastic. Nick, thank you so much for chatting with me today. I appreciate it.

Nicolas Cuttriss, MD:

Thanks so much for having me, Ruth. Pleasure to be here.

Ruth Adewuya, MD:

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