Sugar’s Dirty Secret: The Toxic AGEs Lurking in Your Food Transcript

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Introduction to AGEs and Heart Health

So welcome back to at the Reversing Heart Disease Naturally Summit. I'm super, super stoked today to be interviewing Doctor Khan who is the originator host of this and who graciously asked me to co-host with him, which has been a joy and a pleasure.

And we're going to talk to him and pick his brain about everything. Cardiology, thank you so much for being here. Excited to work with you and all those great audience.

Thank you. Thank you. And we could talk for hours and days about all the things that people need to know, that, you know, in order to help prevent them from being victim to a cardiac disease.

But we're going to talk about this first, this sorry. We are going to talk about advanced glycation end products, also called ages. What the heck is that?

A lot of people are wondering. So let's start there. What the heck are ages? Yeah, I have to say, I mean, I was in medical school a long time ago. I learned nothing on this topic and I don't think medical students currently learn about this either.

But I was blown away about a decade ago, maybe 12 years ago, when this, topic, was thrust upon me during a variety of lectures. And actually currently there's 19,000 peer reviewed articles, which is a huge body of data that everybody, viewing this summit should be able to say advanced glycation end products are critically important or the abbreviation ages are critically important, but I've never heard of them before.

And, you know, you're the expert on metabolic health. And we talk about trying to control our blood sugar and keep it under control. But what's so bad about your blood sugar being up?

You know, we don't really connect those dots often. We just assume it's not good.

How Advanced Glycation End Products Form

But in the 1970s, a team of researchers at Rockefeller University and Mount Sinai Medical Center, both in New York, identified something really simple we use every day in clinical practice that an elevated blood sugar will attach to proteins and alter, modify, and actually make them not as, effective in their job, whatever they're doing as those that don't have a sugar coating to the protein.

And they established a test back then 40, 50, 50 years ago called hemoglobin A1. See how sugar coated is your hemoglobin inside your red blood cells. And that's become a routine test.

But it's an abnormality, which is why the high levels worry us as clinicians. And the low levels are more favorable the more sugar combines with protein, and occasionally it combines with fats, the more it alters them.

And the end result is something called the development of advanced glycation end products, a family of chemicals. They all have challenging names methoxy glycol and CML, but a family of chemicals that does harm.

And so we have to know about this family of chemicals. With 19,000 scientific articles behind them for the past 50 years. Not just that. That's why the blood test, hemoglobin A1, C was developed and is so important, but for a whole range of our risk for heart disease, dementia, cancer, diabetes, metabolic problems.

So let's go a little deeper into that for sure. Yeah for sure. So like how do they form. You said they attach. But is there a specific process by which they form.

Yeah. Without geeking out too much there's something called ends thematic reactions. Probably some of you had biology classes remember the word enzymes.

So you can have sugar attached to something because an enzyme is involved. This is not that this is a passive combination. It's called non enzymatic linking.

But it will change your proteins and what it does to your proteins. It makes them stiff. Well why does that matter. What's in the wall of your artery. Proteins.

What in your facial skin. Proteins. What's in your brain cells. Proteins. What's in all the organs of your body's proteins. And if you sugar coat them with this reaction from having a high blood sugar, the very thing you teach, we don't want and we want to adjust our diet and use continuous glucose monitors and various approaches is we want to avoid excessive Lee allowing sugar to do this damaging impact.

So we can actually now explain the reason you don't want a high blood sugar is because it will promote advanced glycation end products, which cause tremendous inflammation throughout the body, chronic inflammation, tremendous oxidative stress through the body, which is another way to damage cells that you don't want damage.

And finally, to promote stiffening. Stiffening. One of the hallmarks of aging. Just look at an elderly person and ask them to bend over and pick up something.

Our tissues get stiff, our collagen gets stiff, our tendons good, stiff. And all of that relates to years and years chronically accumulating this family of chemicals.

We call it ages. And, you know, it's actually anti-aging to have a lower amount of advanced glycation and products. And it's row aging. They have a lot.

So you mentioned hemoglobin and C is a measure of how much that's happening in a specific protein called hemoglobin. And it's related to blood sugar. And all that.

And are there others. Are there other tests for it. Yeah. Well, you know, a really good question I asked myself is why is nobody talking about this to any frequent degree?

Testing AGE Levels in the Body

Why do you not see the cover of Newsweek or the magazine or newspaper article, or talking with your doctor in an annual visit? Why is nobody mentioning this?

And that has been the challenge of measuring it. We know it happens. We've got all this scientific data. It's in the cardiology literature everywhere.

It's in the diabetes literature, everywhere. It's in the cancer and dementia literature everywhere. Why don't we hear about it? Because it is difficult to measure in research studies, you can measure the levels of some of these chemicals, advanced glycation end products.

But there is not a clinically available easy blood test to say, whoa, my blood levels are sky high, and ask the question why? And we've talked about one way we develop advanced glycation end products.

I want to be sure we do talk about the second one because it's fascinating. But it turns out in about the last decade there is a machine. It has a simple name called the Age Reader, and it's about as big as a loaf of bread.

And all you do is your rest, your bare skin of your arm on a sensor and a number appears and it turns out that is measuring the concentration chronically up to that day, of how much some of these advanced glycation end products are in the tissues.

And there's a couple hundred research studies that have used this machine made in the Netherlands. We've had it in my clinic in suburban Detroit now for a number of months, and it is incredible that we can have this conversation.

Now, if you don't have a test, it's pretty hard to have the conversation. So we're testing. And finally, people are very abnormal. And sometimes we're surprised we're testing people.

I would have expected to be rather, in a danger zone, and they're not. So one more tool in the toolbox to help prevent chronic disease. Absolutely. And you mentioned the second way I want to hear about that one.

The second way, I want everybody to listen because this is not something you're going to hear at most summits. It turns out you developed a high level of these chemicals that you don't want from the two pathway.

As we talked about the chronically elevated blood sugar, we can call that insulin resistance prediabetes or just type one or type two diabetics. They will be challenge by an excess production of stiffening throughout the body, premature aging and advanced glycation products.

But the other fascinating, thing that has been shown for about 20 years, it's the way we cook, even maybe more so than what we cook. So a professor again in New York developed a method to test foods and then to test how we cook our foods.

Just think about caramelizing onions. They start out white and moist, but by high, high heat they turn brown. That's called the Maillard reaction and a chemical name that's about 100 years old now, Doctor Miller.

And it turns out anything we cook from a slice of toast to a breast chicken to a slice of bacon to even, tofu and a portabella mushroom. High dry heat, high dry heat.

Think of a barbecue. Think of a griddle. Think of turning your toaster oven on and having somebody really get toasted.

Cooking Methods and High-AGE Foods

High dry heat will dramatically change whatever food that is into a high advanced glycation end product. Food. And people thought it didn't matter to always identified that those chemicals in the chicken breast, those chemicals in the tofu slice do get absorbed.

The advanced glycation end products get absorbed from our food into our bloodstream, and they will directly cause this whole process of inflammation, oxidative stress, stiffening of our blood vessels, our facial, appearances, our collagen throughout our organs and lead to chronic disease.

So, as we say, it's almost how we cook more than, necessarily what we're eating. Although the advantage, though, is in the research, Doctor of Less era in New York, did plant based foods with the exception of roasted nuts and sometimes like grilled tofu, plant based foods are naturally very low in ag aggie's, fruits and vegetables and grains, they're very low.

And even if you do toast, or roast, or barbecue, a board about mushroom, you'll get eggs. But you're getting relatively low amounts. The ones that really are prone are chicken, bacon, red meat.

But for sure, cheeses, certain cheeses. Anytime you got protein and fat in a food, think of a hamburger. And then you will grill it or barbecue it or roast it.

You will create an insane amount of AGI. So the plant based diet is naturally protective. Both from keeping our blood sugar lower if we do it right as you teach and from actually the concentration and the cooking method, it's a big advantage to whole food plant based to keep our ages down.

And now we can test it in the clinic is interesting. Interesting. So it's a acrylamide fall into this. Is that one of the

advanced. Acrylamide chemicals are a different pathway that usually red meat comes up as the topic is promoting cancer.

But acrylamide is a separate production. Then advanced glycation end products. And that's important to point out. This is not the only pathway that favors.

What do we know about the biochemistry of whole food plant based eating that favors lower rates of heart disease, dementia and diabetes and cancer? There's actually a multitude of them, but probably the largest science is for the, avoidance of high levels of advanced glycation end products.

Doctor Voss has actually published these tables, and if you really want and calculated, you want to keep your eggs per day under 8000 units. And boy, if you eat salads and soups and lentils and all the good food we eat, you're not going to have any problem with that.

But if you're a meat eater, if you're a chicken breast lover, if you like to barbecue, you're going to be challenged. Just just a small three slices of bacon grilled for five minutes will exceed the entire day's suggested allowance.

And a lot of people eat a lot more bacon than that. Bacon is actually number one on the list of high age foods. Interesting, interesting. There's a lot of people out there promoting eating bacon all day long as a as a food thing.

Okay, so we met you mentioned hemoglobin A1, C right as one of the ones we know how to measure. You mentioned the arm. Are there any other ways. Are there any like fructose I mean does that fall into that category.

No, there are no other readily available ways right now to get an idea how much of these chemicals. But you can assume, and you can read the research.

The seminal paper was published in 2010, listing 500 foods. And for example, I know I'm not promoting chicken eating, but if you take a breasted chicken and put it in a soup which is not dry heat, that's moist temperature cooking, you get very few ages developing.

And if you take the same chicken breast and throw it on the barbecue, you're getting a tremendous amount. So you can calculate and examine what's my diet like?

What am I probably doing to my age is level. And if you have these diseases, early memory problems you've struggled with blood sugar and weight. And certainly if you're a heart patient or don't want to be a hard patient, you want to gravitate to these lower ages food.

But again, legumes, whole grains, if you can tolerate them, fruits and vegetables will always put you. Except for maybe roasted nuts are a little high and grilled tofu is a little high.

You know, traditionally tofu was in a miso soup. Again, moisture is good. Marinades are your friend. A lower heat cooking is your friend. A crock pot is your friend.

Commercial brand. An Instant Pot is your friend because it's all about moisture, lower temperature, cooking. So again, raw food, that's your friend. You know, a big salad is going to always be a winner in avoidance of advanced glycation end products.

And I'm telling you, a cardiologist should be talking about this. We're just not grabbing on to this. You know, a huge amount of data. Yeah, but what you what you said is very interesting.

And it's a way to transition people into a lower ages diet that we're not ready yet for. A plant based diet is to instead of roasting your chicken or barbecuing your chicken.

Right, putting it in a pot and steam it, or make it part of a stir fry in a pot, right? Or put it in the Instant Pot and make it part of a bit of diet.

That or a meal that has lots and lots of veggies mixed in it.

Lowering AGEs with Diet and Supplements

So it's ways that people who aren't ready to go all Whole foods plant based, that they can gradually transition to a less dangerous version of, including some of those meats in there.

Yeah, I agree. And again, none of us are promoting that. Just start eating chicken. But, there is one book written on a low age diet, but it's a very animal heavy book because it's being written for the, public at large.

And that is what they teach, because they're not teaching what you and I teach, which is move over. You almost don't need a low age diet book for whole food plant based diets, because it's naturally going to be very, very low, which is just wonderful.

And just one more reason you've heard about the environment. You heard about animal rights, you've heard about, you know, reversal of diabetes and, reversal of heart disease from Doctor Ornish and Esselstyn.

But, keeping your age, content of your diet low if you're striving to look good as you age, feel good as you age, be able to bend over, put your socks on is your age.

It all relates to both what we eat and how we prepare our food. Fascinating. Love it, love it, love it. So assuming somebody comes into your office and you put their arm on this machine and you find they're off the charts, ages, can that be reversed or are you just coaching them on to how to, you know, stabilize it and not increase it?

Yeah, it's a great question. And it can be reversed. Not in a day. These, toxic chemicals. And we don't know any good news about these chemicals. There's nothing really advantage.

We don't want them in our body, but they accumulate over months to years. So the number on the age reader will go down in a few months. It won't go down by tomorrow.

But it's not like monitoring your blood sugar on your finger prick or a continuous glucose monitor. And you can do it with education about the diet with moist lower heat cooking or raw foods.

As a major staple of your diet and plant based choices as a major staple or only staple in your diet, there are a few supplements. The most studied. One is a variant of B vitamin.

Everybody's heard of thiamin, diamond, B vitamin. There's a modified version called Benford Diamond I learned while 12 years ago. B and food TMI and they and there actually are provocative studies.

I'm having some early memory issues, and I either take a placebo or I take Benford Diamond, a very safe, inexpensive vitamin for the next 12 months. And I repeat my memory test that's actually been done as clinical science.

It will improve the memory capability of a human. We're not talking about, in this case, rat science. There's some great data that I'm a diabetic, and I go for some testing of my artery function and endothelial function.

Now either get put on placebo or Benford diamond for six months or 12 months. It will improve and they'll function. In fact, they will improve that readily.

So that is a tool besides dietary education that we use in my clinic. It's safe, it's inexpensive, it's available, and it is backed by science. It's just it's the last vitamin you'll ever hear in most conversations.

And maybe it ought to be up. There is one of the first, really? Yeah. And it's one that I use a lot in my clinical practice as well. And it also affects the gut.

You have a lot of people who are having leaky gut issues, and there have been studies that show that it can help in the repair of the lining of the gut.

So it's and it is underused. And it's hard to say. That's kind of why you say it. Very well, very good. I have been practicing and I'm just. Saying it.

Just until I got this age reader in my clinic, you know, it was hard to discuss. It still is a little hard. I'm working on some handout, some brochures, and, you know, education is the key.

I mean, you didn't hear about Benford diamond in ages and forks over knives. We just heard about the benefits of a whole food plant based diet. But there's just one massive amount of reason that, you know, as you eat to reverse your heart disease.

Through the giants that we had a chance interview. You'll be reversing multitude risks to your health. Yes. And it's why the blue zones of longevity are so plant forward.

And again, what isn't, you know, plant based in many of the blue zones soups with a little bit of animal product, casseroles, a little bit of animal product, but moist lower heat cooking.

Yeah. None of the, you know, blue zones really feature, you know, barbecuing, grilling and high dry heat cooking as a staple. But they do maybe on a celebration or a festival or a wedding, but not day to day.

I mean, just think of a fire and a big soup kettle. Moisture is your friend. Moisture is your friend, and you get in. You get to enjoy a lot of the benefits of the veggies in there, the they're letting go of some of their nutrients into the soup broth and you're eating that.

So it's a great alternative to what people are doing. So thank you for sharing that. And any last words about ages. No, I think, you know, now that people are educated, I almost challenge people.

Go to your computer, in your search engine and put in the long word advanced glycation end product. You're going to spend the next month trying to read all that comes up.

It's there over and over. And that's what makes me so excited. It's in the medical journals everywhere. It's really, it couldn't possibly read all the science, and it's starting to show up in magazines.

Certain dietitians are teaching it. So there's lots of resources. And if you put in a low advanced glycation end product, vegan recipes, you'll see lots that pop up very often, featuring a crock pot or the high pressure Instant Pot.

So lots of immediate steps all of us can take in. If you're going to throw a portabella mushroom. And the barbecue actually put it in some kind of container with either vinegar, lemon juice, actually wine and black beer, any of those you do you want those marinades are particularly effective at preventing the formation of these chemical compounds.

Just neat little tips we can all do. Yeah. Little tips. Yeah I love it I love it. So thank you for all of this. This is really been enlightening and it's been practical.

It's giving people practical information they can do to reduce their aging via advanced glycation end products and also to protect themselves. So I really appreciate that.

And I find that when people understand the science, which you are so brilliant at explaining in a simplified way, they get it and they're more likely to take action.

So thank you. And, we are at the end of our talk about ages. Thank you.