



## **Episode 403: How Berberine Can Increase Insulin**

With Dr. Martin Katz, Dr. John Gildea and David Roberts

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David Roberts:

Hey, everybody, it's David Roberts. You're listening to the MarLabs podcast, and today I have Dr. John Gildea and Dr. Martin Katz with me.

Dr. Martin Katz:

Hello.

David Roberts:

Hello, gentlemen.

Dr. Martin Katz:

Hello. Good afternoon.

David Roberts:

And we are going to be talking about a question that was asked about our last podcast, which was on berberine and Ozempic, and how berberine is not nature's Ozempic. And so Linda writes in and asks, "I heard one of the speakers mention," and that was John, "that berberine can increase insulin secretion if eating habits are not optimal while taking berberine. Can you elaborate on this in your weekly tips? Thanks so much. Please note, I'm not planning to eat lots of glucose, but sometimes it happens. Thanks again." And so I wanted to see if we can just start out with Martin and sharing some about insulin and metabolic syndrome and kind of how things work there. And then John, I believe since you had mentioned that, kind of in mysterious vignette, about berberine and insulin secretion, you can jump in, but Martin first.

Dr. Martin Katz:

Yeah, I mean, I'd start with going way, way back thousands and thousands of years and just helping us understand these molecules and helping us understand that these molecules are actually good and not bad. But unfortunately, in today's day and age, with a plethora and a lack of movement, we've created a metabolic disorder. Metabolic syndrome is something a little bit different where you have high blood pressure, high triglycerides, too much fat around the middle, et cetera, et cetera. You can look it up, but disordered metabolism and getting away from homeostasis is the problem. And so many, many years ago, during the late summer months, thousands of years ago, we would still be killing certain creatures and eating them and getting ready for winter. And this is when fruits were around, and those fruits would help increase insulin when you ate them in a good amount.

And insulin is really not there for glucose control. It's there for fat metabolism and fat storage. And so you would start storing this fat, and you would want to do a fair amount of it to get ready for the winter when there was not as many things around to eat. Fast-forward to today, or the last 70, 100, 150 years, where there is a plethora of grocery stores, and a plethora of food, and a plethora of food choices within those grocery stores. We are not hunting our food. We're not chasing after it. We are literally going from waking up in the morning to work, driving to work. Generally, we're not riding, we're not running, we're not walking. We're driving to work. We're sitting at work for eight hours. We're not really moving around too much. We're stressing out, which again, we won't get into cortisol, what cortisol does, but we're stressing out. We're at work, we get back in our car, go to this very convenient grocery store where we have a plethora of foods which include both fat and sugar. Really, if you think about nature, there's no food in nature that has both fat and sugar within that same organism or plant or whatever.

David Roberts:

Twinkies.

Dr. Martin Katz:

The Twinkie-

Dr. John Gildea:

[inaudible 00:03:35] there's organic-

David Roberts:

That well known [inaudible 00:03:36] nature.

Dr. Martin Katz:

Well known Twinkie plant. That's plant, as in a corporate food producing plant, not a green god producing plant. Big difference. And Michael Pollan has said that, eat foods made by a plant, not in a plant. Thank you, Michael Pollan. Anyway, so again, there's a plethora of food. We pack it all up, we go back to our car, drive home, make our food, eat it while watching television, get sleepy because we've had a long day, and fall asleep and repeat, repeat, repeat.

David Roberts:

I'm getting depressed.

Dr. Martin Katz:

Well, it is actually depressing, actually, and it actually can cause depression, but that's a whole nother story, and we can do that another day. But again, what happens is now our insulin's working, it's putting it into the cell. Fortunately, at this point, it is decreasing gluconeogenesis within the liver. So insulin, again, in and of itself, is not bad.

David Roberts:

And gluconeogenesis [inaudible 00:04:40].

Dr. Martin Katz:

Easy for you to say. Gluconeogenesis is the liver producing glucose. So you always want glucose around. You need glucose to run and be able to be active, and so it's a very important system to have intact. The problem is you're putting more and more sugar and fat into the cell with this combination of insulin, or sugar producing insulin, and fat within the same meal. You're not using it, you're sedentary, and the cells continue to build this up, and you now develop an insulin resistance. In other words, the slot that insulin goes into to wake the cell up, to increase GLUT2 or GLUT5 or GLUT4, which accepts glucose into the cell, that mechanism doesn't work as well. And people have sort of described this as putting gum into a keyhole, or putty, and trying to get that key to work, and it just doesn't work.

So you become insulin resistant, which then tells your pancreas to make more insulin to try and deal with this glucose and these fats. And you just produce more and more and put more into to the cell, which further increases glucose... Sorry, further increases fat within the cell. And you possibly land up with fatty liver. Now your liver is not working, not metabolically intact, and now you don't respond to

insulin, and so gluconeogenesis goes up. So now your liver continues to produce glucose, you continue to eat too much glucose, just too much glucose around, and then you start poisoning the cell and it's a downhill battle. And glucose... I mean, sorry, diabetes, the leading cause of amputations, blindness.

David Roberts:

What's the incidence of diabetes now?

Dr. Martin Katz:

Very high. Too high. And the problem is this used to be an adult mediated disease process, and unfortunately we're starting to see it mid to late teenage years where kids are eating way too many processed foods and just not moving like they used to move. And so we're seeing it early and earlier, and so the incidence is increasing dramatically.

David Roberts:

11.6%.

Dr. Martin Katz:

Yeah. And rising.

David Roberts:

There's a comedian/toastmaster, I think it was a little Instagram blurb video where this guy, he's giving a speech, he pulls out a cigarette, he's acting like he's going to light it, and everybody's like... There's this stir in the audience. And he's like, "What?" And he's like, "Oh, you think it's bad because it causes lung cancer. Well, none of you would've had that reaction if I pulled out a Twinkie or a Snickers bar and started eating it, because it's socially acceptable. But diabetes is... Not a worse killer, but it affects more people."

Dr. Martin Katz:

Well, absolutely. And diabetes has a specific diagnosis, but this disordered glucose metabolism is real, and there are studies to suggest fasting glucose should be under 90, certainly under 95, and I rarely see a fasting glucose under 90. Rarely.

David Roberts:

Do you guys know your fasting glucose?

Dr. Martin Katz:

I do.

David Roberts:

What's yours?

Dr. Martin Katz:

94. I'm working very hard to get that under 90 at this point. But, I mean, I-

Dr. John Gildea:

I just did mine. It's 86.

Dr. Martin Katz:

Yeah.

David Roberts:

Good job, John. Proud of you. Martin, keep up the trying.

Dr. Martin Katz:

I am working super hard to get that, yeah, below 90, absolutely. And then that produces... And I'm hoping John's going to talk about these things called glycation end products. In medicine, we do monitor them all the time, certainly in diabetics, and I am increasingly monitoring them more and more in people who don't have diabetes. But hemoglobin A1C is an early glycation end product where this glucose is now combining with the red blood cell. You turn red blood cells over every three months, and so you can watch what's happening with the hemoglobin A1C and see what your glucose has been over the last three months, approximately. And so a score certainly under 5.6 is what you want.

David Roberts:

Martin, we may have a suggested supplement that may help your fasting blood glucose.

Dr. Martin Katz:

I'm absolutely taking my berberine two tablets at night, no question.

David Roberts:

BerbElite.

Dr. Martin Katz:

BerbElite. Yeah, what's interesting though, is I have a compliance issue. I have to get into the habit, And that habit is the hard thing. I'm in very good habits about eating healthy and exercising, and I've increased my zone two quite a bit with these-

David Roberts:

Have you read Atomic Habits yet?

Dr. Martin Katz:

I have.

Dr. John Gildea:

Bundle your habits.

Dr. Martin Katz:

Bundle the good habits, absolutely. Yeah, and I am doing that. So what do I do at night? And so what good habits do I do at night? And putting the BerbElite there to make sure that I am taking it. Certainly, it's good.

Dr. John Gildea:

If you haven't read Atomic Habits yet by James Clear, you certainly should.

David Roberts:

So... Thank you. That was actually a really good, incredible explanation. Very thorough. And so going back-

Dr. Martin Katz:

You're welcome.

David Roberts:

Thank you again. Thank you for thanking me.

Dr. John Gildea:

Yeah, talking about what berberine does, and when you understand what normal blood glucose and insulin is, it's not hard. But because you don't usually have that framework, how berberine works is hard to describe, but it's really mimicking fasting. So berberine activates AMP kinase, it's the same thing that's activated when you're fasting. And so it's doing a mimic of... It's a mimicking of that. And the thing that we got a little bit crossed up on there was we weren't talking about a person who was in pre-diabetes versus a normal person. But in my case, if I'm talking to a general population, pre-diabetes is as high as 50% of the population. And so most likely they're not watching what they're eating, and their blood glucose likely is a little bit high. And so if you take berberine in that scenario, it will actually make you secrete more insulin.

And so there's a number of papers that show that it does increase the amount of insulin, but that's because in the case of insulin resistance and the beginning portions of diabetes, both your cells are turning off responding to insulin to protect them, and your pancreas is responding by turning down its sensitivity to glucose. So both of those are becoming dysfunctional at the same time. But if you get berberine to your beta cells in your pancreas, it's sensing that glucose a little bit better and it will secrete insulin sooner. Kind of like an 18-year-old athlete. They're going to be responding to the meal that they eat by making glucose and absorbing it fast, and then their area under the curve for their insulin response is shallow. And so that's kind of how... That area under the curve for that response to insulin and glucose is how you accurately define what insulin resistance and diabetes is.

Dr. Martin Katz:

And that's how you were comparing it to the GLP-1, and that's it.

David Roberts:

Ozempic.

Dr. Martin Katz:

[inaudible 00:12:40].

David Roberts:

Because Ozempic Increases insulin

Dr. Martin Katz:

In answer to that young lady's question.

Dr. John Gildea:

Yeah, so that's the only connection between those two, I think.