

## Episode 178: Headache, Migraine, and MSG

### **Lindsay Weitzel, PhD:**

Hello, everyone, and welcome to HeadWise, the weekly videocast and podcast of the National Headache Foundation. I'm Dr. Lindsay Weitzel, I am the founder of Migraine Nation, and I have had chronic and daily migraine since the age of four. I'm excited to be here today with repeat guest and headache medicine specialist Dr. Fred Cohen. Hello, Dr. Cohen, how are you doing?

### **Fred Cohen, MD:**

I'm well. Thank you for having me back.

### **Lindsay Weitzel, PhD:**

Well, thank you for being here. We are very excited to hear what you have to say. You're an awesome guest. Dr. Cohen is an assistant professor at the Icahn School of Medicine at Mount Sinai. He is also a headache specialist. He has an awesome viewpoint on all the things we want to hear about.

Our topic today is monosodium glutamate, or MSG, as a migraine trigger. Is there really evidence that it could be a trigger. If I want to eliminate it from my diet, how do I do so. It is much trickier than you might think. And we're also going to talk a bit about dietary triggers in general, and what we can do to eliminate them or go about avoiding them, et cetera. So, Dr. Cohen, for our guests who may not know who you are, can you tell them what motivates you to work in headache medicine?

### **Fred Cohen, MD:**

Sure. Like you yourself have said, I too suffer from migraine. I did my entire life since I can remember. And I had no idea. I just suffered from this horrible headache I would get every week, and I just went about my life. And it was in med school sitting in class, in a neurology class, where they brought up this is a migraine. And it was eye-opening. And then from there, I've met headache specialists. And now for the first time in my life, I received help for a condition that burdened me my entire life. It was so debilitating. And I realized this is the kind of doctor I want to be. I want to give this help that has helped me so much. And that's what led me to both my career being a provider and doing my research, and I love it very much.

### **Lindsay Weitzel, PhD:**

I love to hear that. So first of all, I want to just say that the word trigger is becoming sort of a dirty word in the migraine community. Focusing too much on triggers can sometimes bring us anxiety. Some of us have a tendency to get a little hyper-focused on finding our triggers and start blaming ourselves every time we experience a migraine symptom, like we did something wrong. In your opinion, what role do triggers in general play in migraine disease?

### **Fred Cohen, MD:**

You're absolutely right. I have many patients who could become very focused on triggers and finding it. So there is a role. And triggers are a vast thing. And why do they exist is migraine, these attacks, are a

process of neuroinflammation. It's this whole inflammation cascade that gets set off. And what sets it off? That's a very good question. If we solve it, you'll win the Nobel Prize in Medicine.

There's many reasons we don't fully understand. But it's for some people, it might be some of these external things that are happening. And many patients come to me trying to find their trigger. And for some people, they might not find it. It might just be a more internal process. And then I've also had patients that have found triggers. And certainly, a lot of things could be a trigger.

**Lindsay Weitzel, PhD:**

In your opinion, how many triggers do you think the average person with migraine has?

**Fred Cohen, MD:**

What I tell my patients is first, every single migraine, their headache, whatever condition they come in for, they're unique. There could be, we have our common triggers, which I'll talk about in a second. But the example I always give is, this was a true story of a case I had a couple months ago, where over months of this patient following me, she kept a good headache log. We figured out the headaches were occurring. Her migraine attacks were happening in the morning. And long story short, I said tell me what you're having for breakfast. It was eggs. I said, stop eating eggs. And the migraine stopped. What? Eggs being a trigger? I never saw that again, but for that patient, it happened to be a trigger for her.

So, the range could be certainly anything. For myself, flying on a plane is a trigger. If I know I go up in the air, after landing, that night, I'm going to have a bad migraine attack. The more common triggers that we see are weather changes is very common. I have patients that could be like, I could predict when it's going to rain. Barometric pressure changes, being in hot weather, doing extensive exercise, being dehydrated are common. Lack of sleep or change of sleep.

But then we also have dietary ones. Common dietary ones could be alcohol, could be caffeine. Caffeine is actually interesting because it's a double-edged sword. You have patients who caffeine will help their migraine attacks. You have those that will trigger their migraine attacks. There's gluten, artificial sweeteners certainly, I hear a lot, and then nitrates, which you find in processed meats and whatnot.

**Lindsay Weitzel, PhD:**

Let's get back to MSG. We are going to talk a little bit about triggers in general. We're going to focus on MSG today. What is monosodium glutamate or MSG?

**Fred Cohen, MD:**

MSG, monosodium glutamate, in the name, it's a form of glutamate, which is an amino acid. And we find it in various forms, lots of ways. Our body produces glutamate on its own. We also digest it. Glutamate is throughout our entire body. Our brains use it a lot. Glutamate, you could think in a more simple state, is like brain energy. The neurons utilize this to send signals and whatnot. And the monosodium glutamate is a form of it.

And it does occur naturally. A lot of people think it is a synthetic sweetener. It is naturally found. And you actually could find it in foods such as tomatoes. Some cheeses like parmesan, cheddar have it. Certain

fishes like anchovies and sardines have it. Squid and clams have it. And seaweed and kelp, they all naturally have it. And of course, it could be used as an additive in foods in various ways.

**Lindsay Weitzel, PhD:**

That was going to be my next question. And I love that you said that. I was surprised to hear this because I actually embarrassingly have a degree or two in nutrition, and I did not know that MSG naturally occurred in foods until we were talking about this episode, but it does, right? It's not just an additive.

**Fred Cohen, MD:**

Correct. It's not just an additive.

**Lindsay Weitzel, PhD:**

Right. So, there's foods that I wouldn't have considered removing from my diet if I was trying to get rid of MSG until you told me about it. I find that very interesting in this episode. How much evidence is there that MSG is actually a trigger for migraine?

**Fred Cohen, MD:**

The evidence is sort of muddled is the best way to put it. I'll start with the history of it. MSG as a trigger for symptoms started back in the late 60s. It's a very interesting story by a physician named Dr. Man Kwok, who sort of came up with this constellation of symptoms, and he dubbed it coming from Chinese food and actually the condition was called "Chinese restaurant syndrome" and it sort of exploded. Various articles in the 70s and 80s came up with people consuming MSG and causing abdominal pain, headache, bloating, et cetera.

It was actually later that Dr. Kwok said that he actually was referring to American-made Chinese food. He's actually Cantonese. He was like, no, I was talking about how the United States makes it, not all Chinese, and he regrets calling it that. So the evidence was they did these trials in the 70s, 80s, and 90s where they gave MSG to participants in both food, meaning they would do a broth, a soup, a meal, and they would add MSG, or they would do it as like a soda, a drink, and they would add it as well.

And the trials showed that it could, some of them, showed it caused headaches, some didn't. But what's interesting is the trials, they would use a lot of MSG. We're talking 1.5 to 3 grams of MSG. The actual average intake of MSG is around 0.4 to maybe 1 gram. So it's a lot of MSG. So it's sort of muddled that well, like for instance, if I drink a ton of caffeine, while caffeine doesn't trigger a migraine, I will start getting jittery if I just start consuming a ton of caffeine. And that's why it's very questionable if MSG is truly a trigger for headache and migraine.

**Lindsay Weitzel, PhD:**

Is there any physiology that we're aware of? Is there any physiology you can tell us behind the possibility of MSG causing migraine?

**Fred Cohen, MD:**

There are some theories with it. They have done a lot of studies on mice and rats, but again, it's giving a ton of MSG, and it has shown neuronal changes and whatnot. The thought is that MSG could cause headache and migraine because again it's glutamate. Think of glutamate as neuron energy. It's causing all this glutaminergic activation, so a lot of pathways can become activated when consuming it.

**Lindsay Weitzel, PhD:**

I find that very interesting. So, I love that answer. We're going to get to the part that was most fun for me as I mentioned before. I want to hear all these foods that MSG is in that I was not aware of. Can you give us some idea of the foods that MSG is in, just so that we are aware?

**Fred Cohen, MD:**

Sure. So, foods that MSG is naturally in is, I was saying tomatoes. There's various kinds of fish, such as anchovies, sardines, clams, squid, have MSG naturally in it. Kelp, seaweed also in the ocean have it. And then you have stuff such as peas can have it in it. Potatoes to a small amount have it in it. And also corn to a small degree. When I say small, the amount I'm talking about is around maybe 50 to 200 milligrams. Again, to give numbers, I was saying before how these trials gave like 1.5 to 3 grams. While it's naturally in these foods, again, it's a small amount.

**Lindsay Weitzel, PhD:**

What about the use of MSG in cooking?

**Fred Cohen, MD:**

MSG is commonly thought to be in Chinese cuisine, Asian cuisine, which it is used, but it's used a lot too. It's used in Italian cooking. It is a flavor enhancer. MSG is an umami substance. Umami is one of the taste buds. And so it's like think of adding something sour, something salty, something savory. Umami is one of these taste buds, and that's what MSG serves. So it's used in various cooking. It's not just Asian cuisine, which again is another misnomer. Because people commonly will think, oh, I have an insensitivity to MSG, I'm going to only avoid Chinese food. But then they go out to other takeout restaurants, and it certainly could be there.

**Lindsay Weitzel, PhD:**

We've listed some foods it's naturally in. We've pointed out that it's used in cooking in various foods, but it's also an additive, am I right, in a lot of processed foods, whether it's chips or things like that, where it's more obvious and you can read it on the label, correct?

**Fred Cohen, MD:**

Yes, it's found in a lot of processed foods. It's a commonplace additive, and you could see it on the ingredients.

**Lindsay Weitzel, PhD:**

Let's talk about elimination diets. How do you recommend going about an elimination diet?

**Fred Cohen, MD:**

Elimination diet, the most important thing is adherence, keeping to it. Because what is an elimination diet? Hence, what it says, you're removing something from your diet. And what I recommend when patients ask me that, is what do I do? How long? Two weeks.

So, I'll use, as we're talking about, MSG as an example. That means for two weeks, you're diligent about making sure everything you consume does not have MSG or whatever you're removing. Because you want to make sure that this actually having an effect or not. Do one kind of food. I don't recommend, because you want to know what's causing it, you eliminate a lot of things at once, you're not going to truly know.

And patients ask, well, where should I start? And when I get asked that, I think, well, if there's certain meals or foods that you have a thought of it doing, start with that. But if not, you go one by one. Two weeks don't consume dairy. Two weeks don't consume alcohol. Two weeks don't consume caffeine. And again, you keep to that strict timetable. And if you get those two weeks, you do not notice the effect then, then it's not a trigger. But if you do notice, oh, you know what, these past two weeks, my migraine, my headache, they haven't been as severe, then that might certainly suggest it could be a possible trigger for you.

**Lindsay Weitzel, PhD:**

I love that. We used MSG as an example. But if you want to do an elimination diet, it's two weeks and be very strict about it and then move on to the next thing that you think could be causing it. And I think that's just a really important advice because people are always wondering, and you might not be eliminating it long enough. Thank you for that advice. Is there anything else you'd like to add to our discussion of MSG as a migraine trigger?

**Fred Cohen, MD:**

I would add that first, it certainly can be. I don't want to diminish anyone who they do think that MSG is causing related to their migraine or headache attacks. But if you yourself have thought, oh, MSG is a trigger for me and think about what have you been eating. Because like I said, for a lot of patients, they think that when I bring this up, they go, oh, no, I've been eating these other kinds of takeouts. Oh, when I look at my snacks, there it is. Because again, it's very easy to label it to one kind of food. And again, I don't want people thinking, oh, I'm going to stop eating tomatoes and whatnot.

The studies that have done it, they did a large amount. It could very well be that certain people have a certain threshold. Like if I go over a gram, 2 grams, et cetera. So, the natural consumption of that MSG might not trigger it, but if you eat a processed food or a takeout place that they put a lot in, that could certainly trigger it. It's like everyone's migraine and headache is unique, and you might have a different threshold, or it might not affect you at all.

**Lindsay Weitzel, PhD:**

Dr. Cohen, before we go, I believe you have a website now where you have some advice for people that love to hear what you have to say. What is that?

**Fred Cohen, MD:**

Sure, thank you. Headache123.com. It has a lot of articles I publish, a bit about myself, as well as I do a blog about hot topics going on in headache medicine. I just did a post about vitamin D and migraine.

**Lindsay Weitzel, PhD:**

All right. Well, thank you so much for being here today.

**Fred Cohen, MD:**

Thank you for having me.

**Lindsay Weitzel, PhD:**

Thank you everyone for listening. Please join us again next week for our next episode of HeadWise. Bye-bye.