Episode 213: Weather, Headache, and Migraine: What is the Connection?

Lindsay Weitzel, PhD:
Hello everyone, and welcome to HeadWise, the videocast and podcast of the National Headache Foundation. I'm Dr. Lindsay Weitzel. I am the founder of Migraine Nation, and I have a history of chronic and daily migraine that began at the age of four. I'm excited to be here today with repeat guest and headache medicine specialist Dr. Fred Cohen. Hi, Dr. Cohen. How are you today?

Fred Cohen, MD:
I'm well, thank you for having me again.

Lindsay Weitzel, PhD:
Well, thank you for being here. Dr. Cohen is an Assistant Professor at the Icahn School of Medicine at Mount Sinai. He's one of our favorite guests. We always have a lot of fun with him, and we learn so much. Our episode today is about weather and migraine. This is a really, really common thing to talk about. Everyone always wants to hear why they're triggered, when the weather changes, etc.

Dr. Cohen is an author on some of the new data that we're going to discuss, and we're going to talk about what's known, what we feel when the weather changes. So, everybody just tune in and settle in and listen to what Dr. Cohen has to say.

Let's begin by asking is the association between migraine and weather changes real. I mean, it feels like it is, but it also feels like it might not be because it's not the same for every one of us. It's not even the same for each of us all the time. So, tell us, is it real? Do we have data to show that it really occurs?

Fred Cohen, MD:
Absolutely. So yes, I would say it's real. This is a very common thing that I hear from my patients and not just my patients, in population studies. There's been populations studies in the condition of migraine and as far back as the late 80s. And as far as triggers, it's been brought up a lot, weather changes. And when we say weather changes, we're talking about anywhere from temperature changes hot to cold, storms, blizzards, heat waves, cold fronts, etc. So, it's a very, very commonly reported thing in patients. Typically, in patient diaries, when they talk about what brings on their headaches, that is a reoccurring thing. It's been reported for decades.

Lindsay Weitzel, PhD:
It is interesting because my son, who's quite young, also has chronic migraine. And I have noticed that he's triggered first if there's a weather change and then I'll be triggered later in the storm. I know that we're all quite different. What are the most common weather triggers? Are there certain ones that trigger people more than others? For example, is wind worse than cold, etc.?

Fred Cohen, MD:
I wouldn't call one the most common, but we do have several events that are more common than others that I hear from my patients. For instance, storms are really common to hear. Heat waves, cold fronts, blizzards, hail, those are ones that are commonly brought up. I have patients who might be in other areas of the country where it's more common, for instance, to have stronger thunderstorms and stuff like that. It could be any weather phenomenon for instance.

Lindsay Weitzel, PhD:
I know that many of us will follow barometric pressure changes on our phone or certain weather apps, because it is believed that that can be a problem for people with migraine. Is it really due to the barometric pressure changes or is temperature one of the problems? What is the cause? What is the reason that we get migraine attacks related to weather changes?

Fred Cohen, MD:
So that is a really big question that I'll break up in several ways, where it's sort of both in a way. What I mean by that is that temperature and weather events like thunderstorms are, let's say, two different things. One of them is low pressure, high pressure. The pressure system is what usually, details that like let's say incoming rain, incoming thunderstorm, you go from high to low etc. And then where the temperature, how hot it is, how cold it is, might not be as related to that. There's some people that might, for instance like you were saying with your son with a storm, it might be barometric changes and or your trigger might be related to the temperature.

And what that sort of boils down on people trying to figure out migraine more is what receptors are involved. And that's something I'm actually working with a group where we actually have data that we're examining patients and their headache days with their age, what medications they're taking, how it changes with weather, and also the weather events involved temperature changes, pressure changes, barometric pressure, etc.

Lindsay Weitzel, PhD:
So different receptors might be triggered based on different variables related to the weather. Is that what you mean?

Fred Cohen, MD:
Right. So, I'll give an example. We know for instance there are barrier receptors in our brain. We know that they respond to the atmosphere readings etc. And there is thought behind that, that when there is a barometric change, these receptors are activated. They change in some way. And then that somehow might lead downstream to a migraine attack. How so? That's not figured out but that is postulated.

Temperature is similar. We know there are these receptors called transient receptor potential channels. There's a bunch of them. They relate to hot to cold stimulus, etc. And we know that those changes can lead to inflammation and pain. So that's why there's a thought that if there's a lot of heat, the heat related TRP receptor goes off. If there's a lot of cold, that related one. There's actually a company working on a potential migraine treatment targeting TRPM3, which as I said, all of these receptors deal

with hot or cold. This one deals with heat. And again, that's the thought that maybe during a heat wave, this receptor is firing off leading to a migraine attack.

Lindsay Weitzel, PhD:
That's so interesting. My next question was going to be, because so many people wonder if I moved somewhere else, would I feel better? Do we know if there are particular areas of the country that are better or worse for people with migraine? Or might it be different for everyone based on possibly which receptor is most likely to trigger our problem?

Fred Cohen, MD:
I've been asked this by patients, and I would say I've never told the patient to move, because that's a that's a big thing. All right, uproot yourself, financially and all this stuff, and go somewhere else. That's a big ask and I don't have a guarantee. Again, weather related change of migraine is a new area we're scientifically examining. So, I'll start with that saying no, I wouldn't make that as an official recommendation. I have had patients that brought up, hey, I live in Boston, New York, etc., and I moved to California, and I noticed that I get less headaches there. And then they had made that move. And also vice versa. I've had people move to Arizona with the anticipation that, oh, there's less rain, I'll be fine, with no change. So, I'll never give that as a recommendation to move. And I've had patients who said they've done that for eczema and other conditions. For some it has worked. But to make that an official recommendation as a physician, as a provider, I wouldn't go to that step.

Lindsay Weitzel, PhD:
You were one of the authors on a recent weather and migraine study that was presented at the American Headache Society meeting. What was the main question or hypothesis? What were they looking for in that study?

Fred Cohen, MD:
This is what I was alluding to earlier. Myself, and also I want to give a shout out to Dr. Vince Martin, who's the President of the National Headache Foundation. He's my colleague and lead on this. We worked along with Teva, for they are the manufacturer of Ajovy, one of the CGRP monoclonal antibody treatments. And we worked with their statistics team looking at data that they obtained through their HALO trials. These are the clinical trials. They were evaluating Ajovy for the treatment of episodic and chronic migraine. And they recorded during these trials actually weather events, weather data. They were recording precipitation, pressure changes, temperature, etc. So, we were looking at before and after with treatment of Ajovy. And we had over 600 patients that had daily diary records. And we also had additional weather data as well. And we had it across the country, with the exception of, not the Pacific Northwest, but states like Wyoming and Montana. There were none there which we found very surprising. Everywhere else we got. That was just like a dead zone. But my point is, we had data throughout, and this is something we are still working on.

There's a lot of data we're working through. But what we published and presented at the recent scientific meeting for the American Headache Society, was we saw that with weather related events, that we indeed saw patients before and after treatment were having weather related headaches. That with treatment of Ajovy (fremanezumab) that those decreased. And we also saw that these were

related to having an average temperature increase of 10 degrees Fahrenheit. Meaning that if there was all of a sudden the temperature went up as such, that there was increased risk of having a headache. There is other metrics we're looking at such as precipitation, changes in barometric pressure, etc. Meaning I'm not saying this is the only one, but this is what we've published thus far.

Lindsay Weitzel, PhD:
Based on that data and that study, it sounds like we've found some success in a decreasing weather-related migraine with preventive medication. What about acute medication? Do we treat weather related migraine with the same acute medications as every other migraine? Or is it treated differently?

Fred Cohen, MD:
In the end, a migraine attack is a migraine attack. Meaning that yes, in the end we treat it the same. If a patient comes to me and tells me, if your son was to tell me I get a migraine attack after a storm, then you're going to treat your migraine attack. Unfortunately, we cannot control the weather. Storms will happen. Heat waves will happen. And also there are migraines that will happen without trigger. I get migraine myself and I get them without trigger. So proper acute and preventive medication is still paramount. Of course, we'll work to address triggers, try to minimize triggers, but attacks will happen.

One optimal strategy, and this has been looked at in the States and also around the country, is tracking weather. I know, for instance, there was a big study in Japan where they had a migraine diary app that specifically warned their users, hey, there's a storm coming. And therefore, it gave them sort of a heads up, oh I should carry my triptan or my gepant, etc. So always, if you feel that weather related events are a trigger for yourself, make sure every day you check the weather and if it's going to be a storm or something that triggers you, you prepare yourself enough adequate therapy.

Lindsay Weitzel, PhD:
Is there any other interesting weather-related information that has been learned recently that we can add? It sounds like we've made sure everyone knows that they're not alone, that it's real, it's not in their imagination, that it can be treated preventively and acutely. Is there anything else that you feel like people should know before we close today?

Fred Cohen, MD:
Well, I want to start on that. My big take and what I'm most excited with our published data, and more to come. I anticipate there will be publications and more presentations on the data we're working on, is the decrease the minimization of this. I can't tell you how many patients and when they tell me they feel weather affects their migraine attacks. And I go, yeah, I know. And they're like all my other doctors or providers were like, oh, okay, like they've been shrugged off. That's a major component. And as we've talked before, the stigmatization of migraine is a major issue we have. A lot of my patients, and I know it's an issue across not just the country, the world, is oh, they're just having a headache attack. Migraine is more than that. It is a disabling burdensome disease. It's the number one cause of disability for women ages 18 to 50. It's a serious issue. And it's been discredited a lot. When people say, oh yeah, it's weather. Well now we're showing data. Hey, like there's data now there's actual numbers. It's not just people reporting it. It is more. Now we have barometric weather-related metric numbers to discuss about.

And I'll give an example of how that can make a difference. It's a common thing now that people discuss oh, we know opiates, Percocet etc. is bad for migraine. That's been discussed for a long time. But for a long time, it was still given in the emergency room by doctors, even though population studies were saying, hey, it's not good. Finally, in around, I'm trying to think 2018 or so, a group, I actually work with them at Montefiore, we actually published the data looking, hey, look, we took an opiate and a non-opiate and we showed the opiates much worse. What was different? We actually had numbers to back it up and people stopped. Unfortunately for the scientific community, sometimes you have to show hard numbers to be adequate evidence to make a difference.

And that's what I hope with this. Is not only now we could show this data to validate this as a trigger, but use it as a springboard for more studies to come. Because it's not just showing a result, it's to make a foundation for others to look at this and go, hey, I think this this seems like a legitimate problem, let's do a study on this. I hope these publications, people are able to use it to get grants, to get medications approved, etc. I wanted to start the conversation.

Lindsay Weitzel, PhD:
With invisible illness, data is so important. So, I love that you said that. And I love that studies are being done. And thank you so much for being with us today to talk to everyone about this. And thank you everyone for joining us. Please join us again for our next episode of HeadWise. Bye-bye.