



Episode 262: Understanding Hemiplegic Migraine

Lindsay Weitzel, PhD:

Hello everyone and welcome to the podcast and videocast of the National Headache Foundation. I'm Dr. Lindsay Weitzel. I'm the founder of the education and support group MigraineNation, and I have a history of chronic and daily migraine that began at the age of four. I am excited to be here today with headache specialist Dr. Vincent Martin. Hello, Dr. Martin, how are you?

Vincent Martin, MD:

It's my pleasure to be here. I'm doing great.

Lindsay Weitzel, PhD:

Dr. Martin has been on HeadWise numerous times. We are excited to have him back. He is a professor of internal medicine professor of internal medicine and neurology at the University of Cincinnati, and he is the past president of the National Headache Foundation. He is a headache specialist, and he knows a lot about our topic today.

We are going to talk about hemiplegic migraine. Hemiplegic migraine is a subtype of migraine with aura, where people experience muscle weakness or paralysis on one side of the body that is temporary and fully reversible. And we have some updates, some more recent findings about hemiplegic migraine that he's going to talk about. And he's going to give us just a full educational episode on all things on this topic. So, Dr. Martin, can you begin by telling us some of the general information about hemiplegic migraine, like what the experience is like for patients and how common it is?

Vincent Martin, MD:

Well, we'll start with how common it is. It's very rare, so it's less than 1 in 10,000. It's very, very uncommon, and that's fortunate. But from a patient standpoint, oftentimes they'll experience a weakness on one side of their body, and it usually marches. So, the symptom may start say in their face, and they may get a droop, and then it marches down to their arm. And their arm gets weak, and then it marches down into their leg. And that's the main distinguishing feature between an aura that we experience in migraine, because hemiplegic migraine is an aura, and say, a neurologic event called a TIA, which is transient ischemic attack or stroke, where people develop weakness.

And that's probably the main thing that you need to make sure of is when you have your very first attack of weakness or paralysis on one side of your body, you're not going to be thinking first that you're having a hemiplegic migraine. You need to make sure that you're not having one of these neurologic events where you have low blood flow to your brain, stroke, TIA. So that's kind of the first vantage point.

But before we even get there, you first have to be sure that you're having a weakness of your arm and leg and maybe face. Because a lot of people will make the mistake that they'll have some numbness, which is more of a sensory aura or numbness of their arm or numbness of their leg and they will mistake that for weakness. So if you're able to move, if you feel like you're having hemiplegic migraine, but you're able to move your arm and do all the same activities, and then on exam by a physician, there's no demonstrable weakness when you're having one of these attacks, then maybe you're just having sensory symptoms and you may not be even having hemiplegic migraine. So, it tends to be something that's rather over diagnosed. Like there's many people who report they have hemiplegic migraine, but when you actually take an adequate history and do an adequate exam, they were later found out not to have true episodes of weakness of the arm and leg.

Lindsay Weitzel, PhD:

People with migraine, we can have such a diverse array of symptoms. And if we've had it a long time, we can feel like we're used to just about anything. So, at what point should we be wondering if we should go to the hospital? Because now we're like, wow, we have hemiplegic migraine, or we could be having a stroke. When should we go to the hospital and make sure that we're not having a stroke, since we're talking about these sorts of symptoms?

Vincent Martin, MD:

Well, if you haven't been diagnosed yet, if you have your first episode of weakness on one side, I would go to the emergency room immediately, because that's the thing that you have to make sure you're not having is a stroke, as basically we had alluded to before. So, when you get to the ED, emergency room, they're going to do a whole stroke workup. In fact, you'd want to get there as soon as you can, because if you were having a stroke, there's a certain time window that you need to get therapies for the stroke. And if you wait on this, then you may not have those treatments available to you. They're called thrombolytics.

So, the evaluation initially would be, they would do a CAT scan and they would do something, probably in the emergency room, they would do something called a CT angiogram, which is where they look at the blood vessels that go up the neck and in the head to see if there's any blockage in those arteries to make sure you're not having a stroke. And they would do just a regular CAT scan of the brain to make sure there's no evidence of a stroke or a bleed into your head. And then as a follow up to that, they would probably do an echo of your heart to make sure that there's not any valvular heart lesions on the left side of the heart or something called a PFO, which is where there's a little hole between the atria of the heart, two of the chambers of the heart.

And often in those PFOs, little blood clots can form inside the PFO, and they can kind of go up into the head. And those can trigger, interestingly, it can cause stroke. Or they can cause attacks of aura in some patients. So, there can be a very fine line between when you have either a sensory aura, which is like numbness on one side of your body, or if you have weakness on one side of your body, between that and a TIA, which is a transient ischemic event. Because both of those episodes are transient events where the neurologic symptoms resolve over a short period of time, like several hours typically. So that's kind of the workup.

Sometimes they'll do a workup for clotting disorders too. Because if you've got like a clotting disorder where you're more likely to develop a blood clot in your leg, one's called a Factor V Leiden gene

mutation or prothrombin gene mutation, some of those abnormalities or genetic disorders that predispose to clotting can also predispose to clot formation, either within that PFO or within these valvular heart lesions on the left side of the heart. So that's the first evaluation that you would get. You'd probably get a bunch of blood work, the CT scan, and the CT angiogram to make sure you're not having a stroke. So that's the first thing I would worry about if this happens for the first time.

Lindsay Weitzel, PhD:

That seemed very specific to stroke. If you found out that you had not had a stroke, but you were continuing to get migraine with aura, hemiplegic migraine, what would the work up be then? Would it be similar?

Vincent Martin, MD:

Well, once you've had a diagnosis of hemiplegic migraines, so these are recurrent episodes, they're clearly associated with you have both the weakness on one side and then it's usually followed by a migraine after that. And the symptoms march, so they start in one location and go to another. Those are all characteristic of an aura. That's certainly less concerning than a stroke because there's no known neurologic damage from that, but it's still something that may require other evaluations as well. And you probably need at that point an MRI of your head and some evaluation of blood vessels. If you've had these recurrently over time, I would probably get that evaluation. And in some cases, I'll look for that little hole in the heart call a PFO. Because if you're throwing little clots up into your head, little, tiny ones, not ones that cause stroke, and that could be creating attacks of aura that might need to be evaluated as well.

Lindsay Weitzel, PhD:

Just out of curiosity, we're always hearing with migraine, migraine of any type, it's unilateral, seems to be this often unilateral, not always, but involvement. So, when it comes to hemiplegic migraine, why are these symptoms that can be full body, why are they only on one side?

Vincent Martin, MD:

Well that's because the aura is occurring on the opposite side of the brain, so it's just similar to a stroke. So, it really is a matter of what is causing aura. So, the aura is thought to be this electrical wave that first causes the nerve cells to fire off. And then as this wave traverses the cortex, the surface of the brain, it goes at a very specific rate, like 2 to 5mm per minute, it basically causes the nerve cells to fire, and then they become suppressed. And this wave kind of gradually propagates. So when it's in the visual cortex for vision, you get the visual aura, the flashing lights, the zig-zaggy lines. When it goes to the sensory part of the brain, the parietal cortex, you can get pins and needles in your fingertips, numbness symptoms, but involves the motor cortex, which involves weakness, motor strength, then you get the hemiplegic migraine in that situation. Or you can. So, it really is a matter of where is the aura located. It's going to be always going to be opposite to the side of the symptoms, or at least at least with sensory and motor symptoms. And it depends on what part of the brain is involved when that electrical wave goes through it.

Lindsay Weitzel, PhD:

Is there any difference between hemiplegic migraine and other types of migraine with aura when it comes to age of onset or triggers or other factors?

Vincent Martin, MD:

Well, if you have a genetic cause for the hemiplegic migraine, it tends to come on at a very early age. I can't say that it's necessarily any earlier than typical aura, so when you're just having a visual aura or maybe a sensory aura. But it does tend to occur quite earlier in the course as compared to something called sporadic hemiplegic migraine, which does not have a genetic cause, tends to come on later in life.

Lindsay Weitzel, PhD:

I was going to ask you about that later, but let's go into that. What is the difference between sporadic hemiplegic migraine and the genetic type?

Vincent Martin, MD:

Well, the genetic type has very specific gene mutations and most of them involve the pores on nerve cells. And it basically, one involves a calcium channel, one involves something called a sodium-potassium ATPase, which is a particular kind of pump on a nerve cell. And the third one involves a sodium channel, which is a little pore that allows sodium ions to go across it. So hemiplegic migraine, for the most part, is if it's genetic, tends to be what we call autosomal dominant. That means that the gene can occur from one or the other parent, and one gene, if it's passed on, it will usually cause the disease. Although it's not 100% if you have the gene that you're going to have these episodes, but it's fairly high, like 60%, that people if you have if you have a gene, there's about a 60% chance you're going to have attacks of weakness or these hemiplegic migraine attacks.

And there are some newer genes that have come out too, most of them involve ion channels as well. Some of these are not always fully accepted yet within the scientific community that they may be true hemiplegic migraine genes. But the genetic form is very interesting because the therapies may differ depending on what form of genetic mutation that you might have. So if you have the calcium channel gene, we tend to use something called acetazolamide, which is a specific water pill. It kind of can cause a little bit of a mild acid buildup in the bloodstream, which can be very effective for treating those attacks. If you have the sodium channel that's involved, then we often use basically seizure meds that block sodium channels. And the one that we commonly use is something called lamotrigine. And then if you have the other one that involves the sodium-potassium ATPase pump, we'll often use drugs that we usually use just for migraines aura in general, things like verapamil, another med called flunarizine, which is only available over in Europe and in other non-U.S. countries. And some seizure meds, things like that divalproex, and sometimes even gabapentin we'll use in that situation.

So, it depends on what these genetic causes, there's different drug combinations that one might use. But I think it's important to tell the viewers that there are no randomized controlled trials for any drugs in hemiplegic migraines. So, all the treatment recommendations from all the different groups are based on theory, case reports, just a few patients being treated in this way or that way, so that there can really be no firm conclusions on treatment of hemiplegic migraine at this point.

Lindsay Weitzel, PhD:

It's very rare, so it's difficult to study. Is there a range of severity of hemiplegic migraine, either within the same person or from person to person? And does it vary based on which gene they might have?

Vincent Martin, MD:

Well, the unique thing about these genetic, we'll talk about sporadic after this, but when you've got a genetic cause is that they can have a lot of symptoms outside of just the weakness on one side of the body and also the head pain of a migraine. Like, for example, if they take a head trauma like this, they can go into a coma. So coma can occur with these things and they can get really off balance. So they might go to one side or the other. So that's called ataxia. And they can get other symptoms that we would commonly think of as with what we call migraine with brainstem aura where they'll develop vertigo. They can develop double vision. So, there can be some overlap between these two different disorders as well.

So, hemiplegia migraine is more than just a headache. And it's more than just a hemiplegia, just the weakness on one side. It can involve a lot of other symptoms. And those symptoms are far more common in people that have genetic causes for hemiplegic migraine than those that have what we call sporadic. So those are people that do not have a genetic cause for their hemiplegia, hemiplegic migraine. And that tends to be far more common than those that have genetic causes.

Lindsay Weitzel, PhD:

And do they present differently?

Vincent Martin, MD:

I would say that at least in those patients, they're probably less likely to have the other symptoms outside of the weakness and the head pain than those that have the genetic causes for hemiplegic migraine. So, it might be two different disorders that we're looking at. And they're probably are a variety of, some of the people that were calling sporadic probably have genetic mutations that we just haven't recognized yet as being associated with hemiplegic migraine. So, it's still evolving science in the field.

Lindsay Weitzel, PhD:

Right. And we probably should mention that one of the genes you referred to, and you did say that not all of these genes, only three of them are widely recognized, but one of the ones you referred to, the SCN2A was just published this year. So, if you're one of those people that follows these things, this is a new one. And that's why we're suddenly referring to five that that people are looking at least, even if they're not all widely recognized.

So one of the other questions that I wanted to ask is if you have hemiplegic migraine, is every migraine you experience a hemiplegic migraine or do patients also get other types of migraine either with or without aura?

Vincent Martin, MD:

No. You can get other types of migraine too. So not every attack is going to be an attack with hemiplegia. So you can get some with just have other or typical auras, visual or sensory aura, and then some may not have any aura at all. So, you can have all those different situations.

Lindsay Weitzel, PhD:

We did cover some medications related to the specific genes that are linked to hemiplegic migraine. Let's go back to medications. Are there certain medications to use in the acute setting. What else can you tell us about medications in hemiplegic migraine.

Vincent Martin, MD:

Well there are some potential limitations with acute medications in hemiplegic migraine. For example the triptans, they're drugs like sumatriptan and rizatriptan, they're probably the most commonly prescribed migraine meds when someone has a headache. So, an acute med is only used when they actually have acute pain, to get rid of the pain. They do cause a tiny bit of constriction of arteries.

And many, many years ago, this probably goes back 20, 30, 40 years. It was thought that hemiplegic migraine was caused by constriction of arteries and low blood flow to the brain. So, all of these drugs received a contradiction in all of the package inserts for all the triptans and it's remained since they first came out in like '93 until present. So right now, if you have a diagnosis of hemiplegic migraine, a definite diagnosis, they would recommend, at least at least by package insert, they could not use triptans. That has been challenged by some neurologists because we now think, as I said before, that this is a neurologic or neuronal wave of electricity that traverses the surface of the brain. It's more of a neurologic event. So it may not make sense to not use these drugs when you're not dealing with low blood flow potentially to the brain per se. But the current package inserts are still what they are, so it becomes somewhat problematic.

So, a lot of times you'll use anti-inflammatories in these patients. You sometimes you'll use acetaminophen which may or may not work. And then the whole question is can you use some of the newer acute meds called the gepants. They don't really cause any problems with low blood flow to the brain, but we don't have great studies looking at whether they're safe in people with hemiplegic migraine either. So, I think if you're going to use those, you have to realize that there just aren't any studies available. But theoretically they wouldn't constrict arteries. So, I mean, so theoretically that probably would be all right, but we don't know that from clinical studies yet. So that's acute meds.

In terms of like just general prevention for someone that has a hemiplegic migraine, and we kind of like briefly touched on that before, but calcium channel blockers tend to be very, very important. I mean we talked about one of the gene mutations being a calcium channel. So, there's some thought that calcium channels might be effective. And just mostly in those sporadic cases where there's no genetic cause, then that can be an effective medication in many patients. And then usually a lot of the anticonvulsants, there's one called lamotrigine, which is often used in patients with aura that can be used particularly in patients with sporadic hemiplegic migraine as well in terms of a preventive. And then there's other seizure meds. Sometimes we'll use gabapentin. Sometimes we'll use something called Depakote which is divalproex. So, there's other seizure meds that we might use in this situation as well.

And then there are some studies of this gene mutation called the MTHFR gene mutation. I think we talked about that a long time ago in one of these episodes. And that sometimes is associated with high homocysteine levels. And homocysteine within the brain can trigger attacks of aura. So, if someone were to have that particular gene mutation, I use something called Foltx, which is a combination pill of B12, folic acid, and vitamin B6. And at least in some studies that's been suggested to decrease the frequency of auras and just generally auras. I'm not aware of any studies looking at hemiplegic migraine.

So those are kind of the drugs I would use differently in hemiplegic migraine. And many of those drugs I might use differently in patients with aura in general, even if they don't have hemiplegic migraine. I might use verapamil. I might use a seizure med that makes sense. I might use the B12, B6 and folic acid in those people. So I actually have a different combination of preventives that I will use in people with aura, because I think that people that have aura and people that have migraine with or without aura, I think those are different causes of those two different types of headache.

Lindsay Weitzel, PhD:

The ones you just mentioned, were they mostly for sporadic or both for sporadic and the genetic form?

Vincent Martin, MD:

I think you can use either type. Let's face it, the targeted therapies for very specific gene mutations it's based on theory. So, you could theoretically use any of these medications for genetic or sporadic forms of hemiplegic migraine. So, in fact oftentimes we do. So, I wouldn't say that I would only use acetazolamide for the CACNA1A, but that's kind of what theoretically would work in those different situations.

Lindsay Weitzel, PhD:

So, there's none that you would specifically use for sporadic versus genetic.

Vincent Martin, MD:

No. I sometimes use acetazolamide too for patients that have sporadic form. So even though in theory that a specific gene mutation might respond better to one than the other, oftentimes you're combining multiple therapies in these people.

Lindsay Weitzel, PhD:

Is there anything else you'd like to add on the topic of hemiplegic migraine before we go today?

Vincent Martin, MD:

Well, I would first say that fortunately it's a very rare disorder. It can be very concerning to patients when this does happen, particularly when they're worried about potentially having a stroke when they're first working up these symptoms of weakness. But once we have the diagnosis, the disease can be treated, and you can dramatically reduce the frequency and severity of these attacks of hemiplegic

migraine. So, I would I would end with this with the fact that there are treatments that are effective for this and that most of the time we can make a pretty substantial impact in decreasing the frequency and severity of these attacks of this very rare and very worrisome type of headache.

Lindsay Weitzel, PhD:

All right. Well, thank you so much. This was very helpful. Thank you for being here. And thank you everyone for joining us. Please join us for the next episode of HeadWise. Bye bye.

This episode is for educational purposes only and is not intended to provide medical advice. Please consult your healthcare provider regarding your individual symptoms and treatment options.

©2026 National Headache Foundation. All Rights Reserved.