MIGRAINE WORLD SUMMIT

INTERVIEWS WITH WORLD-LEADING EXPERTS

TRANSCRIPT

WHY SLEEP PROBLEMS PLAGUE KIDS & ADULTS WITH MIGRAINE

JUDITH OWENS, MD, MPH
PROFESSOR OF NEUROLOGY
HARVARD MEDICAL SCHOOL

Introduction (00:05): From the standpoint of the circadian system: The Nobel Prize in medicine a couple of years ago was won by a group of scientists who discovered that not only is there a master circadian clock in the brain, but there are circadian clocks in every cell in the body, which means every organ system in the body. So, if those individual systems are not working in synchrony, or they're "misaligned," as we call it, that has some — as you can imagine — very important repercussions on health in general.

Wendy Bohmfalk (00:45): Sleep can be very problematic for people with migraine. Sleep too much or too little, and you can trigger an attack. Sleep can help with pain, but pain can keep us awake. Sleep can also be a challenge for our children. How do we stay as healthy as possible when it comes to our sleep? And how do we help our children optimize their sleep? To answer these questions, we are joined by Dr. Judith Owens, a world expert in pediatric sleep. Dr. Owens, welcome to the Migraine World Summit.

Dr. Owens (01:16): Thank you so much, Wendy. It's my pleasure.

Wendy Bohmfalk (01:19): We're so happy to have you. Well, let's just start off with, why do we sleep? You know, why is it important?

Dr. Owens (01:26): Well, sleep is an incredibly important pillar of health. And I always like to refer to what's called the two-process model of sleep regulation, which means what determines whether we're sleepy, or whether we're alert, during the 24-hour day. And one of those processes is called the sleep drive. So, the longer you're awake, the stronger your sleep drive. But also, the other piece that determines how we sleep and when we sleep, is the circadian rhythm system. And so that is a fairly predictable series of relative peaks and troughs of alertness throughout the day. So, at 3 in the afternoon, when we reach for a cup of coffee, that's because our circadian rhythms are at a lower ebb; and between 3 a.m. and 5 a.m., that's the lowest point of alertness when, hopefully, most of us are asleep.

Wendy Bohmfalk (02:33): Well, why is sleep so important? You mentioned it's a vital health pillar, but what does it do for us?

Dr. Owens (02:39): Well, sleep does an enormous number of things. So, from the standpoint of the circadian system: The Nobel Prize in medicine a couple of years ago was won by a group of scientists who discovered that not only is there a master circadian clock in the brain, but there are circadian clocks in every cell in the body, which means every organ system in the body. So, if those individual systems are not working in synchrony or they're "misaligned," as we call it, that has some, as you can imagine, very important repercussions on health in general.

Dr. Owens (03:22): So, the metabolic system: an increased risk of Type 2 diabetes. The cardiovascular system: an increase in the risk of strokes and heart attacks. The brain: so, neurocognitive function. And we know that sleep is actually an important factor in the development of Alzheimer's disease, for example. The other piece that's important to understand is something called the glymphatic system. So, this is a system in the brain, which essentially rids the brain of the toxins that have accumulated during the day, and that only happens during sleep. So there's no substitute for sleep, and that's something that we really need to appreciate as a group of people with migraine, and also as a society.

Wendy Bohmfalk (04:17): Great — so it's critical. We want to get it right, and I know that throughout this time today, we'll have some good, new strategies for doing that. You touched

on some of the mechanics of sleep and what happens when we sleep, but I'd love for you to dive into that just a little bit more. What does happen when we sleep?

Dr. Owens (04:35): Well, one of the things that's important to recognize is that there are different stages of sleep — that's what we call "sleep architecture." So, typically, the beginning part of the night is largely spent in what we call slow-wave or deep sleep. And we know that deep sleep is really critical for memory, and for learning; and, in young children in particular, it's the time when growth hormone is released during sleep. At the other end — the last third of the night — we have what's called REM or rapid eye movement sleep. And that is also a stage of sleep that is critical for learning and memory consolidation. So you can see that impacting either of those stages of sleep could have profound repercussions, particularly on cognitive function. And the brain — as smart as it is — if we're not getting enough sleep, what the brain does is increase the amount of deep sleep that we get, to kind of, compensate for insufficient sleep. But there are limitations to that. So, if you are getting five or six hours of sleep a night, your brain doesn't have the capacity to compensate for that.

Wendy Bohmfalk (06:01): So, how do we know if our sleep quality is good? You mentioned sometimes our brain can compensate for our quantity of sleep, but how do we know if we're getting good sleep quality?

Dr. Owens (06:12): That's an excellent question. And you know, there are parameters — based on age — of how much sleep people should be getting at different ages. And as you might imagine, the younger you are, the more sleep you need. But the other clues are: Do you wake up spontaneously without an alarm clock or without multiple reminders to get up out of bed when you need to? And essentially, what that means is that if you can wake up spontaneously, you've probably gotten enough sleep. Now, there are also clues to the fact that you may have daytime sleepiness. So, in adults, you may be dozing off, particularly under circumstances of low stimulation — which sometimes can include driving a car, unfortunately. But a key issue in young children is that daytime sleepiness doesn't naturally manifest itself as yawning or dozing off; it can actually be acted out as hyperactivity, or poor impulse control, or inattentiveness. So, it may be a very different kind of picture in terms of daytime sleepiness for younger children. The third clue is, if, when given the opportunity, you sleep longer. That means you need more sleep.

Wendy Bohmfalk (07:56): Those are excellent thoughts to give us. Thank you. Well, what goes wrong with sleep for people with pain conditions? Does pain interfere with our sleep cycles, or what happens there?

Dr. Owens (08:07): Absolutely. So, it's really a bidirectional relationship, as you alluded to in your introduction. So, pain interferes with our ability to fall asleep and stay asleep, but not getting enough sleep or having that circadian misalignment actually makes pain worse. So, it can affect things like increased perception of pain, more intense pain, a lower threshold for experiencing pain, and our tolerance to pain.

Wendy Bohmfalk (08:47): To get more specific with our community, what percentage of people with migraine have trouble with sleep?

Dr. Owens (08:53): Migraine patients are more likely to have sleep disorders — two- to eightfold compared to patients who don't have migraines. And in particular, insomnia is at least twice as common in patients with migraines. And when I say insomnia, essentially, what I mean is either

difficulty falling asleep at the time that you want to go to bed, or difficulty maintaining sleep — so waking for prolonged periods of time.

Dr. Owens (09:30): One very interesting thing is that migraine headaches are more common in the early morning. And you remember — I alluded to earlier — this dip in circadian rhythm at that very time. So, I think there are some hypotheses that it may be partly due, at least, to circadian rhythm issues. Now another interesting facet to all of this is, it's very common for people post-migraine to fall asleep, right? That's a very common associated symptom of migraines.

Dr. Owens (10:20): So, what that might do, however, is really kind of interfere with your sleep schedule. So, say you have a migraine in the afternoon and you sleep for three hours afterward, then you're probably not going to be able to fall asleep at your regular bedtime that night. And that sort of leads to this vicious cycle of increased sleep during the day but decreased sleep at night. And so, that also in that way can contribute to that relationship. So, those are kinds of relationships ... I certainly wouldn't want to make a — pardon the pun — blanket recommendation that people with migraines not sleep afterwards. But our truism about napping is generally: If you're going to take a nap because you're exhausted or because, for whatever reason, you're expecting to get less sleep that night, to use that circadian dip in the late afternoon between 3 p.m. and 5 p.m. — because you're more likely to be able to fall asleep then — and do not nap more than 30 minutes.

Wendy Bohmfalk (11:42): That's great. So set an alarm if you're going to take a nap, and make sure it doesn't go over 30 minutes. It's great advice. Well, we do get a lot of questions from our community, and Lanette wrote in about something you just talked about, actually. And she said: Virtually all of my migraine attacks start early in the morning and wake me from sleep anywhere from 4 a.m. to 8 a.m. You've talked about what might cause morning headaches, but what should we do about them? How can we prevent them?

Dr. Owens (12:10): Well again, timing of any kind of prophylactic medication that is used for the migraine. And this would be something that would be very important to discuss with your migraine healthcare provider, because there are a lot of different medications that are used — some have what's called a longer half-life than others. So, if your headaches typically occur at that time, you may need a different medication that would last longer and prevent that from happening. Again, we're back to this old thing about getting enough sleep.

Wendy Bohmfalk (12:55): Susanne says that she sleeps through the night, but she still wakes up feeling tired. Are there ways to achieve a deeper, or more refreshing sleep like you mentioned before?

Dr. Owens (13:05): Well, so it is important to be consistent in terms of getting the amount of sleep. First of all, a lot of people, I think, assume that they need less sleep than everybody else. And so they may be under the misapprehension that five or six hours is perfectly fine, when in fact, for most adults eight hours is kind of the magic number. Interestingly though, there is what we call a U-shaped curve, which actually, if you sleep too much — like for most people 10 hours a night — that also has a relationship to adverse health consequences for reasons we don't totally understand. But one of those may be that you have an underlying sleep disorder — that even if you're getting enough sleep or even too much sleep, it's because your sleep is poor quality or being disrupted.

Dr. Owens (14:20): One of the most common sleep disruptors is obstructive sleep apnea. And this is an extremely common condition, particularly in men, but we are also seeing it more commonly in women. There are a lot of contributors to sleep apnea, including weight gain; including in some cases, even in adults, enlarged tonsils and adenoids; including anatomical issues like a deviated septum; including allergies. And the key — particularly in adults — symptoms of obstructive sleep apnea is snoring — loud, continuous snoring, and oftentimes in adults, with breathing pauses. In which, essentially, your brain recognizes that you're not getting adequate oxygen, and kind of wakes you up to start breathing again.

Wendy Bohmfalk (15:27): So, I'd like to shift for a minute to children. You mentioned that eight hours is a sweet spot for adults. How much sleep do children need?

Dr. Owens (15:34): Well, it really depends on their age. So, in the first year of life, we're talking about 12 to 14 hours. That includes a daytime nap and usually two naps a day in the first year of life. Probably the most misunderstood group is the teenagers, because I think a lot of teenagers themselves and their parents don't realize that they typically need between eight-and-a-half and even as much as 10 hours of sleep a night. Now, for many, many reasons, but particularly early school start times — which is my bailiwick that I've been advocating for delaying school start times for over a decade — there are many culprits that serve to shorten that sleep opportunity. Oftentimes, in the patients that I see in my clinic, [they] get five or six hours a night. And then, of course, what they do on weekends is sleep in. And that really disrupts your circadian rhythms and kind of messes with your sleep regulation. So you have this vicious cycle of sleeping too little during the week, sleeping too much on the weekends, and that results in all kinds of issues.

Wendy Bohmfalk (17:08): Well, does this also imply then that sleep disorders are common in children or, probably more likely, teens with migraine?

Dr. Owens (17:16): Yes. There is clearly a relationship between that shift. Particularly as students go into middle school and high school, they're much more likely to get less sleep. And when you think about it ... here's a very important thing that happens in adolescent sleep: There's a shift of your natural sleep time and wake time, around the time of puberty. And all adolescents experience this to one degree or another. So typically, if you are able to fall asleep by 8 or 9 o'clock when you're 10 years old, as you go through puberty, that may shift to an average fall-asleep time of 11 p.m. And you can do the math: If you have to get up at 6 in the morning to get to class by 7:15 a.m., then you are only going to get seven hours of sleep at best.

Wendy Bohmfalk (18:24): I think we all are probably familiar with most of the recommendations for good sleep hygiene, but I'd love for you to just review them with us. You know, talk about what the most important ones are.

Dr. Owens (18:35): Certainly having a regular bedtime and wake time as much as possible, that's preceded by a bedtime routine that is calming and relaxing and does not include electronic media. Now that's the bugaboo with the adolescent population, right? Because social networking is understandably such an important part of their lives. But the blue lights in particular from these electronic devices actually suppress your brain's release of melatonin, which is the biomarker for the circadian rhythm system. We're cognizant of the fact that asking a teenager to go to bed at 10 o'clock on weekends may not fly. So, what we recommend is to try to keep your sleep schedule on the weekends within an hour of what you're getting during the week. Meaning not going to sleep more than an hour later and not sleeping in more than an hour.

Dr. Owens (19:49): So, other things: Caffeine. Many over-the-counter medications for headaches and migraines contain caffeine. So, kind of understanding ... and our rule of thumb is generally not to ingest any caffeinated beverages past 4 in the afternoon because caffeine can disrupt your sleep. And also, caffeine withdrawal — so if you stop using caffeine, particularly abruptly — [that] can trigger headaches, as well. So, be mindful and know what the caffeine content of what you are drinking is.

Wendy Bohmfalk (20:33): Right. What about shifting to adults? I'm sure some of these things carry over, but what else do you recommend in terms of good sleep hygiene for adults, too?

Dr. Owens (20:43): Well, in general, it's very similar kinds of basic principles. A bedroom that is quiet, and dark — room-darkening shades can be very helpful. A sound machine, or a white-noise machine if you live in a noisier neighborhood can be helpful, as well. And a relatively cooler temperature: I think a lot of people sleep in a bedroom that ... at 70 degrees [Fahrenheit] ... your body temperature changes during sleep, and sleeping in a room that is too hot is going to interfere with that.

Wendy Bohmfalk (21:25): Well, let's talk about some other techniques that help with improving sleep. I'd love to know what you recommend for your patients. One that pops up a lot is cognitive behavioral therapy for insomnia (CBT-I). Is that something that you recommend? I'd love for you to walk us through some of the other techniques you use.

Dr. Owens (21:43): Yeah, specifically for insomnia, it's very clear that these behavioral and cognitive techniques, like CBT-I, are more effective and should be the first-line treatment for patients with insomnia. Because medications are sometimes necessary, but I really look at them as a Band-Aid, because once you stop the medication — if you haven't addressed the underlying behaviors that perpetuate the insomnia — it's going to come roaring back. So, there are a number of things that people with insomnia do which actually make their insomnia worse. And one of them is lying in bed thinking, "I can't sleep, I can't sleep, I can't sleep." And so, that creates this kind of state of hyperarousal and hypervigilance, which is totally contradictory to being able to relax enough to let yourself fall asleep.

Dr. Owens (22:46): And then there's catastrophizing: "Well, if I can't fall asleep, I'm not going to be able to get up in the morning. If I can't get up, I'm going to be late to work. If I'm late to work once more, I'm going to get fired." And so that increases that level of arousal and anxiety and worrying. So that's where the cognitive piece of cognitive behavioral therapy comes in.

Dr. Owens (23:12): Many people try to use electronic devices to relax themselves: that's another potential issue. And for patients specifically with insomnia, napping can also be counterproductive. Because they may nap for several hours in the late afternoon, or early evening, and then not be able to fall asleep that night. So those are all very important principles. Also, not using your bed for anything but sleep. Because if you do homework in bed or — reading is probably OK as a way of relaxing yourself to fall asleep, although likely not on an electronic device that emits blue light. And so, one of the principles of CBT-I is: If you can't fall asleep for longer than about 20 minutes or so — don't watch the clock, but estimate — get up out of bed, sit and read, put on a dim light behind you, read something boring until you start doing one of these [mimics nodding off], and then, only then, get back into bed. There's a lot more to it than that, but those are some of the basic principles that are important to understand.

Wendy Bohmfalk (24:38): You mentioned that the hybrid treatment model could actually be helpful for pain and for sleep. Are there other medications that you recommend that could improve both sleep and migraine? I know you said you see sleep medications as a Band-Aid treatment, but is there anything out there that helps with both?

Dr. Owens (24:56): A lot of the analgesic medications that are used for pain control also have sedation as an additional effect. I do use a fair amount — or recommend, because it's over the counter — a fair amount of melatonin. But there are definitely caveats to that. First of all, we don't know what the long-term effects of years worth of use of melatonin are. I do have patients who actually experience more headaches — not necessarily migraines — but report more headaches with melatonin. Melatonin only works, really, to get you to sleep, and doesn't really help you stay asleep. So, it's important to understand the limitations of the use of melatonin.

Dr. Owens (25:58): And finally, in most countries around the world, melatonin is by prescription only. The United States is one of the few countries where it's available over the counter, and so it's not really regulated by the FDA. So, there have been studies which show that the actual amount of melatonin does not match the label in a substantial percentage — as much as a quarter — of the melatonin over-the-counter products. And so, I always recommend that parents use what's called pharmaceutical-grade melatonin. You can Google that and find the brands that are under that umbrella, and they're available online ... as well as in drugstores. But those are kind of the important caveats to the use of melatonin. And it should never be used as a substitute for behavioral interventions.

Wendy Bohmfalk (27:06): Well, just to wrap things up today, I'd love to know if there are any final thoughts that you want to leave with us as we think about our sleep? Particularly as we think about our sleep in conjunction with our migraine disease.

Dr. Owens (27:17): I think just having sleep on the radar screen with any chronic condition, any pain condition. And if — as a parent or as a patient — your doctor doesn't ask about it, please volunteer the information and even bring in a sleep diary. There's a website called sleepeducation.org. It's the American Academy of Sleep Medicine's website for patients and the public. And under "Resources," there's a dropdown link that has a two-week sleep diary to fill out, and it's self-explanatory. And if you fill that out, and you bring that to your next doctor's appointment, that tells your healthcare provider that you are aware of this issue. And you are concerned that this may be affecting the frequency or severity of your migraine headaches.

Wendy Bohmfalk (28:27): I think people with migraine are all too familiar with keeping a diary. So that should be easy enough for us to implement. Well, thank you so much. This has been super informative and helpful, and I know our audience will get a lot out of it. Are there any ways that we can follow the work that you're doing? Or any other resource you'd like to point out to us?

Dr. Owens (28:46): Well, I think, in general, the National Sleep Foundation is an excellent resource for public information about all that is sleep. And sleepeducation.org is also a great resource. So, educate yourself as much as possible. And I wish everyone a good night's sleep and as many pain-free days as possible.

Wendy Bohmfalk (29:17): Thank you so much. And thank you so much for joining us today on the Migraine World Summit.