Conscious Life presents
SLEEP
SUPER CONFERENCE

Sleep and nutrition

Guest: Martin Cowen

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[00:00:10] Kirsty Cullen

Hi. Welcome to the Sleep Super Conference. My name is Kirsty Cullen and I'm CEO of the Optimum Health Clinic, a UK based clinic specializing in fatigue related illness.

In today's interview, we're going to talk about how nutritional therapy tools can be used to best effect to support improvements in sleep. I'm joined by Martina Cowen. Martina holds a degree in psychology and is also a qualified registered nutritional therapist. She practices at the Optimum Health Clinic and along with her clinical experience, Martina has also worked in clinical education and support for one of the leading functional medicine laboratories.

Martina, welcome to the Sleep Super Conference.

Martina Cowen

Hello, Kirsty, and thank you for having me.

Kirsty Cullen

So, Martina, let's start with a question. From a functional and health perspective, why is it that sleep is so important to us?

Martina Cowen

I think if you've never experienced sleeplessness, then you're lucky. So I have to say that most people have experienced a period of sleeplessness in their life at some point. And once you do, you have an understanding of how precious a good night's sleep can really be and how awful it is when you can't sleep.

So during sleep, our body recovers and renews. We flush out toxins, we rebuild muscles, recover tissues, and this includes the brain. We flush out debris and toxins out of the brain so that in the morning we feel refreshed, clear headed, and have a feeling of wellbeing. And normal sleep is also important for growth hormone secretion, which is known as the anti aging hormone, as it stimulates cell reproduction and regeneration.

We know that cognition is linked with sleep and therefore clarity of thoughts, memory and overall cognition can be affected by lack of sleep as well as the physical body.

[00:02:12] Kirsty Cullen

So it's important for a myriad of reasons in a nutshell, but what are the types of disordered sleeping patterns that you might see typically as a clinical practitioner?

Martina Cowen

Okay. With our clients, we often see a disordered pattern of sleep, either problems with getting to sleep, or sleep maintenance, or frequently waking, or even early waking.

Kirsty Cullen

Yeah. And of course, there is that recognized prevalence, isn't there, of sleep disorders within ME/CFS, within that community particularly, but it's not necessarily in the direction that one might assume. So can you explain a little more about the links between the two?

Martina Cowen

I'm sure it won't surprise you when I say that there's a real irony to sleep issues and fatigue. As one gets worse, the other one does too. So oftentimes, if our client's sleep gets worse for any reason, this increases their stress response. And as recovery of tissue decreases during the night, it makes their fatigue worse the following day. One makes the other worse.

Kirsty Cullen

And obviously, ultimately impacts on healing and improvements in health. If we talk then a little more about a disordered sleep pattern, what are the factors that might contribute to that? And I know you have a really nice graphic here to share to demonstrate some of those key elements.

Martina Cowen

That's it. So hopefully you can see that on the screen now. But what we tend to see in the clinic, the main ones are pain, lifestyle choices, shift work or a history of shift work, hormonal imbalances, and stress. And we'll look at each one of these and how you can support yourself with each one. But initially, how does the sleep wake cycle work? So let's start with the most important part, the circadian rhythm.

The circadian rhythm is our body's natural rhythm of internal processes that, among other things, regulates the sleep wake cycle and repeats roughly every 24 hours. It's a little longer than that, but for the purposes of this talk, we're talking about a 24 hours period. So the circadian rhythm is a major part of our sleep cycle and it is triggered by light. So this process is triggered by an external source, a light source, which then triggers sequences of reaction in the body which leads to wakefulness.

And in the process, a variety of things happen which involve the eyes, the brain, our endocrine systems or hormones. Now, sleep is a complex phenomenon and anything affecting any of these steps can then affect sleep.

Kirsty Cullen

So, Martina, if we take stress as a typical example there, can you explain how and why it is that stress impacts on cortisol levels which ultimately then impacts on sleep?

[00:05:22] Martina Cowen

Absolutely. Stress is a big one because stress can disrupt sleep and the lack of sleep can then increase subsequent stress levels. On a physiological level, both sleep and stress share multiple pathways that affect the central nervous system and the neuroendocrine system. And we often talk to clients about the Hypothalamus pituitary adrenal axis, or HPA, which underpins the relationship between stress and sleep disorders.

Hypothalamus is the part of the brain that is involved in the switch between wakefulness and sleep. And it signals the pituitary gland to signal to the adrenal gland to secrete cortisol and wake the body up. And it is the hormones of the HPA axis that modulate the sleep wake cycle. And thus the HPA axis dysfunction can affect sleep.

Now, the issue with stress is that it impacts on the HPA axis and if this happens, it may result in a poor night's sleep. And this is generally fine if we get a good night's sleep the next day. However, it might become something quite different if it becomes more chronic. We also know that some of the stress signals can cross the blood brain barrier and affect our genes in a way that impacts our mood, behavior and cognition.

Kirsty Cullen

So shall we have a look at what HPA disruption looks like on a test result?

Martina Cowen

Let's take a look. So we now have a graph on the page and you can see on the right hand side, we track salivary cortisol secretions throughout the day. And essentially, the results should be within the green area. Now, I'm going to explain what you're looking at here. So you're looking at four different points of collection, so four different times. And the results of the clients are indicated with the black diamond.

And as you can see, only the first diamond is in this green area, suggesting that between seven and nine A.M., the client's cortisol is at the expected level. Now, waking cortisol is expected to be the highest, as it is the cortisol that wakes the body up. And as the day progresses, we then see the cortisol drop right down.

Now, with this particular sample, the client's cortisol is above the expected range for the third and fourth sample. Now, this can indicate that there is a stressor that the client is exposed to and this may then affect the Hypothalamus pituitary adrenal axis and disrupt sleep. Essentially, this client is too stimulated to sleep.

Kirsty Cullen

So, Martina, before we leave this set of test results, which is incredibly useful as an illustration of what we're talking about, let's just talk about those final two markers there. So the third marker, which is collected mid afternoon, typically between three and five o'clock, on this test result, illustrates an elevated level of cortisol. And actually, that's something that we see a lot in clinical practice. It's very common. Could you explain what one of the key triggers for that cortisol elevation at that time of day might be?

[00:08:41] Martina Cowen

Absolutely. Now, this tends to be due to blood sugar dysregulation, where perhaps the diet of the client isn't optimized to their needs.

Kirsty Cullen

So we'll dig into that a little more in a moment. And then if we come to the fourth marker there, which is what I would call the bedtime collection point, again, as you illustrated, cortisol levels are elevated there. And of course, that's really important here, isn't it? Because whilst cortisol remains high, what won't happen is our melatonin levels increasing.

So cortisol and melatonin tend to sit on opposite ends of a seesaw. So we need cortisol levels to drop for our sleep hormone melatonin to elevate so that we can drift into sleep. So what are some of the key reasons that we might see elevated levels of cortisol at bedtime? And what is it that we can do to try and manage that?

Martina Cowen

So it's really worthwhile thinking about stress and any stress that may be affecting your ability to sleep. And that's from a perspective of physical stress, physiological stress, emotional or even environmental. So could there be noise disruption that stops your sleep, such as clock ticking or shop delivery outside your house? Could there be light disruption, such as street light or light emitted from electronic gadgets in your room? Or could it be somebody snoring next to you?

You know, we need to consider all of these things and see how you can resolve them. Can you wear ear plugs or eye masks? Or can you simply remove some of the gadgets from your room? Now, if you're aware that stress is affecting you, then consider if there are any actions that you could take to limit it. Can you perhaps seek help or can some of the issues be resolved or do you need to reach professional help?

Kirsty Cullen

And you also mentioned shift work and obviously this can be an ultimate disruptor of circadian rhythm, can't it?

Martina Cowen

Absolutely, absolutely. We've already spoken a little bit about circadian rhythm and how it initiates sleep. And now we're going to look at the impact of shift work on this rhythm and how changing this rhythm can over time, or immediately, affect your ability to sleep.

Now, I've seen in clinic clients who have had a very short term shift work and it's affected their ability to sleep for a number of years, while others can cope with shift work for quite some time, but it may catch up with them later. Either way, the work of Dr Satchin Panda has been greatly illustrated in his book *The Circadian Code*. And this book may help you to introduce changes to your life that start establishing a pattern that may help with your sleep.

So essentially what happens is that we have photoreceptive cells in our eyes called circadian photoreceptors which are responsive to short wavelength light, or blue light. Now this input is then carried into the brain, specifically into the suprachiasmatic nucleus, which is the central circadian

pacemaker, and this starts the circadian rhythm. And as it is stimulated by light, you can see how light exposure in the morning would be important to this.

[00:12:10] Kirsty Cullen

Yeah, absolutely. And along with morning light exposure, what are some of the other practical tools and recommendations that you might explore with clients both in terms of light exposure but also in terms of blue light restriction?

Martina Cowen

Absolutely. So let's have a look at a few of them. So I would say the first thing is to limit your blue light. We spoke about the short wavelength light, that is called blue light. Now it's not only the daylight that emits it, but also a variety of gadgets that we frequently use in our homes. So, exposure to blue light after dusk can be detrimental to your health. So perhaps turning down your exposure to these, having a curfew perhaps 2 hours before bedtime might be a good consideration.

Another one would be to turn down your lighting or consider even swapping bright light bulbs for dimmer ones, slightly more yellow, warmer tones. You may also consider having screen protectors to block out the blue light if you need to use your computer in the evening. And then another one would be exercise.

Seemingly it's unrelated because it's not to do with the light, but if we bring it back to those stress levels, exercise, specifically aerobic exercise, later on in the day is too stimulatory. So in the evening I'd recommend karma practices such as yoga which might actually be very helpful for sleep.

Kirsty Cullen

So another element that we might see often in clinical practice is, of course, inflammatory pain. Can you talk us through how we might manage this clinically? Because, of course, pain is the ultimate sleep disruptor.

Martina Cowen

Sleep disturbance is perhaps one of the most prevalent complaints of clients with chronically painful conditions. And some of our clients experience pain worse in the night when they don't have other distractions that may enable them to function better during the day. Our first port of call would be to get the client out of pain, and we have a number of methods to do this.

Clearly, you need to work with your doctor first and see what pain treatments might be appropriate for you. But studies also show us that there is a reciprocal relationship between pain and sleep, and that an appropriate intervention with insomnia may improve pain. Now, I'm going to show you a diagram which clearly shows that as fatigue gets worse, the stress increases. Stress can increase inflammation, which can introduce worse pain, which leads to poor sleep. And so it goes on.

Kirsty Cullen

And of course, if we think about that pain continuum, sleep disruption caused by pain tends to result in less REM sleep, which for those with inflammation is also key because REM sleep is important for the production of pain relieving endorphins. So lack of REM may perpetuate the pain cycle even further in that less REM sleep may actually impact on our experience of pain and our pain perception.

[00:15:33]

So there's definitely a cycle that goes on there which we need to work with our medical practitioners and with our functional medicine practitioners to try and interrupt so that we can break the cycle and try to reduce the level of pain so that we can increase our ability to fall into REM sleep and sort of regulate that pattern, as it were.

So I want to shift focus now and introduce more discussion around the importance of hormone balance. We've already mentioned melatonin briefly as the ultimate sleep hormone. But Martina, can you introduce us to some of the other key hormones which might impact sleep quality?

Martina Cowen

Yes. Both men and women need high quality sleep to function optimally, but women are far less likely to achieve this than men. One poll by the National Sleep Foundation revealed that two thirds of women experience sleep problems at least a few nights each week, and up to half said that they wake up feeling unrefreshed. Why is that?

Levels of estrogen and progesterone, which are the primary female hormones, sex hormones, fluctuate during the woman's menstrual cycle and are thought to affect women's sleep. Progesterone is closely tied to sleep quality as it activates GABA, which is an amino acid that enables the body and mind to relax, to fall asleep and sleep soundly through the night.

Now, GABA increases relaxation, reduces stress, creates a more calm and balanced mood, and alleviates pain. But low progesterone effects on sleep is more commonly found in women and the drop in progesterone as females go through perimenopause and menopause and that is why many women have sleep issues through midlife and beyond.

But while we're talking about sex hormones, testosterone is another hormone that is linked with sleep. Testosterone, being a prime male sex hormone, is present in both men and women, and wanes in both too as we age. And with lower testosterone, our brain neurons are not synchronized. And as this synchronization of neurons is important to deep sleep, you can see how sleep issues can develop in both sexes as we age.

Now, much of our ability to get a good night's sleep has to do with our brain's ability to manufacture melatonin. And you briefly mentioned melatonin, Kirsty. Melatonin is produced by the pineal gland and is key to the wake sleep cycle. Our brains secretes melatonin, making it out of serotonin in response to the world becoming dark and increasing in melatonin. And increases in melatonin are associated with shorter times falling asleep.

Essentially, you get to sleep faster if you have a melatonin spike in your brain in the evening with the onset of darkness. Unfortunately, our lifestyles are in conflict with this natural cycle. We use artificial light, which can confuse our brains, so it's no longer clear to the brain if it's day or night, and the blue proportion of the light suppresses the melatonin surge.

Kirsty Cullen

So, given the importance of melatonin in this equation, how can we work to support our melatonin levels overall?

[00:19:08] Martina Cowen

Okay, so here are some things that you can do today to help you regulate your melatonin cycle. In your evening meal, have some foods that enhance your serotonin levels. This may include foods such as brown rice, cottage cheese, turkey, almonds, bananas or even natural yogurt. An amino acid found in these foods can be converted to serotonin and then to melatonin in the body.

The best benefits have been shown when paired with a source of carbohydrate. You can also have a drink. So blending a cup of milk with a small banana and a teaspoon of cinnamon and having it before bedtime can help too, for the same reasons. Because of that serotonin link there. It's dusk, put on yellow, orange or red glasses to block out the blue light spectrum.

You can wear them for several hours before you go to bed. And this corrects the natural light exposure to your eyes and your brain and increases the production of melatonin. Now, ideally, go to bed just after sunset, between eight and ten P.M. if possible. And when you go to sleep, wear a sleep mask at night so your eyes see the darkness when you're in bed.

Now, have the daylight exposure in the morning, so when you wake up within 30 minutes to half an hour, the ideal thing is to have an exposure to natural daylight, so that's when the blue light starts hitting that retina and starts sending that message to release that cortisol and wake the body up. So the more you start doing these things, the more you're establishing that circadian rhythm and slow changes may start to follow then.

Kirsty Cullen

So if we return attention to the nutrition side of things, we already mentioned blood glucose balance earlier in relation to the test result that we were looking at. Can you just tell us a little bit more about why poor blood glucose management might impact sleep?

Martina Cowen

Absolutely. So blood sugar imbalance can be linked with sleep disruption. Now, blood sugar balance refers to the level of glucose entering our bloodstream after digestion of food, more specifically carbohydrates. And once that happens, our pancreas reacts by producing and excreting a number of hormones to regulate the blood glucose and ensure that we have just the right amount of it circulating in the blood.

Now, if we eat refined carbohydrates, such as white sugar, sweets, chocolates, and products from white flour, the digestion is fast and the glucose enters the blood in a rush. And as this happens, the pancreas then overreacts and produces too much insulin to lower the amount of glucose in blood. But it's done in a rapid and almost uncomfortable drop and may end up, essentially the blood glucose may then drop too low.

Now, this can then cause cravings for more carbohydrates, and then you on the merry go round and it starts all over again. So eventually, the body produces too little insulin and this can affect sleep because the blood glucose level may drop too low in the night and the body will wake you to increase it. Therefore, looking after your sleep in this instance isn't done during the night, but during the daytime by eating a diet that balances your blood sugar levels.

[00:22:53] Kirsty Cullen

So let's talk about some of the key nutrients then, and some of the dietary factors that you might recommend to improve blood glucose balance and try to ensure more of a maintained level that will carry you through the night.

Martina Cowen

Okay, so the first one has to be eating protein and fat with your breakfast, lunch and dinner. And if you include any snacks, if you snack between these meals, then include protein in those foods, too, such as nuts and seeds. I'd also recommend limiting your intake of high sugar foods such as cakes, chocolates, dried fruit and even fruit juice, because they will stimulate the blood glucose release too quickly.

Eat moderate amounts of carbohydrates and avoid refined or processed foods. I also recommend cutting down or avoiding cigarettes, and the same with alcohol. And the last thing I would say is to avoid or cut down tea or coffee, as caffeine causes your body to release sugar from storage into your bloodstream, causing a rapid rise of blood sugar levels.

Kirsty Cullen

Superb. Martina, thank you so much for sharing your knowledge with us today. And for those listeners who would like to find out more about what you do and more about the clinic, where can you send them to to share our key information?

Martina Cowen

I would say the first port of call is the website which is theoptimumhealthclinic.com, but we can also be found on Instagram, YouTube, Facebook and Twitter. And we have some really useful free content there that is relative to sleep and energy and other areas of health that the listeners might find really, really helpful.

Kirsty Cullen

Wonderful. Thank you once again for your time today.

Martina Cowen

You're very welcome. Thank you for having me, Kirsty.