How Melatonin Can Actually Worsen Sleep

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Dr. Okun is joined in co-hosting this blog site by Dr. Indu Subramanian a movement neurologist at UCLA, Director of the South West VA PADRECC Parkinson’s Center of Excellence. Dr. Subramanian is also boarded in integrative medicine.

Many investigators have focused on melatonin as an important chemical in the human sleep-wake circadian rhythm. Melatonin is manufactured in the center of the brain in a structure called the pineal gland. René Descartes referred to the pineal gland as the “seat of the soul.” Melatonin from the pineal gland can trigger sleepiness, and can also lower body temperature. The manufacture of melatonin is disrupted by exposure to light. Researchers have postulated that by intervening in the melatonin pathways by exposing people to bright light could have a therapeutic benefit.

Videnovic and colleagues at the National Parkinson Foundation Center of Excellence in
Northwestern University recently explored blood melatonin tests sampled over 24 hours. The tests were designed to uncover some of the mysteries of fatigue, and the sleep-wake disturbances in Parkinson’s disease. The researchers studied twenty Parkinson’s patients and twenty control patients without Parkinson’s. Melatonin blood levels were checked every thirty minutes for twenty-four straight hours. Parkinson’s patients were observed not to secrete melatonin in a normal pattern. Parkinson’s disease patients in the study who suffered from excessive daytime sleepiness or fatigue had more dysfunction in the patterns of melatonin than those without excessive daytime sleepiness or fatigue. How long you had Parkinson’s disease, how severe your motor symptoms were, and what medications you were taking, were not related to the circadian rhythm. The author’s postulated that sleep-wake circadian function could be improved by timed exposure to bright light, and also potentially by exercise. There have been several other small studies that have also suggested Parkinson’s disease motor, as well as non-motor symptoms, may improve with light therapy.

In May 2014, at the 66th Annual Meeting of the American Academy of Neurology (AAN), Videnovic and colleagues presented another study on the preliminary results of light therapy for excessive daytime sleepiness or fatigue. There were thirty patients included with an average duration of disease of approximately seven years. The study intervention was bright light therapy (5000 lux) or dim red-light therapy (300 lux) delivered for two hours a day for fourteen days. The results did not reveal a difference between the groups, however a closer look at the scores in this small study revealed that the Epworth Excessive Sleepiness Scale improved by 2.3 points in the dim red light group, and 4.3 points in the bright light therapy group. Though these results were not robust, they suggested, at least the possibility, that light therapy could be optimized for better results in Parkinson’s disease. Some researchers have suggested that better penetrance of light therapy could be delivered through other techniques including deep brain electrodes, but this remains highly investigational and has only been attempted in animals.

If melatonin release is blocked by exposure to light, and exposing patients to light may improve Parkinson’s disease symptoms, why would patients intentionally take melatonin? Melatonin (N-acetyl-5-methoxy-tryptamine) is also an antioxidant. Neurodegenerative disorders such as Parkinson’s disease have been linked to oxidative damage and free radical generation, and some people believe that melatonin may help in blocking neurodegeneration. There are however no human studies to support the notion that melatonin slows or blocks neurodegeneration. Some patients also use melatonin for sleep issues, though again there are no large well-controlled studies to support this notion, and in many cases reports have surfaced that melatonin replacement may actually worsen sleep in Parkinson’s disease. I have personally listened to
several patients who have tried melatonin, and reported worsening in sleep. If you decide to try melatonin (which is over the counter) for sleep, you should do it under the guidance of a physician. Until more data is published, we cannot make a recommendation as to the usefulness of melatonin replacement for sleep issues.

The bottom line is that there is accumulating evidence that melatonin is important to sleep and to excessive daytime sleepiness in Parkinson’s disease. Melatonin can possibly be powerfully modulated by light therapy and also possibly by exercise. Melatonin pills may not be the answer for many patients with Parkinson’s disease and could potentially worsen symptoms. More research will be needed to clarify how shining a light on Parkinson’s disease may provide a new option for patients, especially those with excessive daytime sleepiness.

*See the full blog post at [Dr. Okun's What's Hot in Parkinson's National Parkinson Foundation Blog](http://www.nationalparkinson.org/blog)

**Selected References:**


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