Light Therapy Effective for Daytime Sleepiness in PD

[Parkinson’s Disease]

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April 29, 2014

Bright-light therapy is safe and effective in improving excessive daytime sleepiness (EDS) in patients with Parkinson’s disease, a small new study has found.

"Light therapy may be a novel nonpharmacological intervention for Parkinson disease," Aleksandar Videnovic, MD, Clinical Neurological Research Institute, Massachusetts General Hospital, Harvard Medical School, Boston, told delegates to the American Academy of Neurology (AAN) 66th Annual Meeting.

Sleep disturbances, he said, are among the most common and disabling nonmotor manifestations of PD, affecting as many as 90% of patients.

Disrupted sleep-wake cycles have a "significant impact" on both patients and their families and caregivers, noted Dr. Videnovic. Such disturbances contribute to poor quality of life, impaired mood, poor cognitive performance, and increased risk for accidents, leading to increased morbidity and mortality.

There is "a great need" to come up with novel approaches to manage these disabling manifestations of PD, said Dr. Videnovic.

"Exposure to bright-light therapy was associated with significant improvement in excessive daytime sleepiness, and this effect persisted to the end of the intervention and 2 weeks after," said Dr. Videnovic. "No similar effect was observed in the group treated with dim red-light therapy."

Beneficial Effects

Evidence in the literature, both in animals and in humans, supports the beneficial effect of exposure to light in patients with PD, said Dr. Videnovic. In a chronic experimental model of PD, exposure to light facilitated recovery of motor function. And a few exploratory studies have documented significant improvements in depression, bradykinesia, rigidity, and dyskinesias.

The current study included 30 patients with PD (13 men and 17 women; mean age, 63 years) who were experiencing EDS, defined as an Epworth Sleepiness Scale (ESS) score of 10 or more.

Researchers randomly assigned these patients to a bright-light (5000 lux) group or to a dim red-light (less than 300 lux) control group. Participants received the light therapy in 1-hour sessions
twice a day for 2 weeks (lux is the measure of light intensity at a specific distance from a light source).

The patients were matched for PD medications and continued to receive a stable medication regimen before and throughout the intervention.

Researchers assessed EDS and sleep quality using the ESS, the Pittsburgh Sleep Quality Index (PSQI), and the Parkinson Disease Sleep Scale at baseline, after treatment (2 weeks), and 2 weeks after light therapy (4 weeks). Additional outcome measures included the Unified Parkinson's Disease Rating Scale (UPDRS), the Fatigue Severity Scale, the Beck Depression Inventory, and the 39-Item Parkinson's Disease Questionnaire scale.

There were no statistically significant differences between the 2 groups in terms of disease characteristics (ie, UPDRS score) or demographic characteristics (ie, sex).

The study found that in the bright-light group, the ESS score was 15.6 at baseline and 11.4 after the intervention ($P = .001$). The ESS score in the control group went from 15.5 at baseline to 13.3 after the intervention ($P = .073$).

Mean changes in EES score were 4.75 in the bright-light group and 1.79 in the control group ($P = .002$). "This showed a statistically significant difference between these 2 treatment allocations," said Dr. Videnovic.

There was also a statistical trend in improvement in UPDRS subscale score 1 week after intervention with bright-light therapy ($P = .059$) and a trend to improvement in sleep quality with the PSQI 2 weeks after ($P = .06$).

Only a handful of adverse events occurred, including 1 patient with transient headache and another with sleepiness (both in the bright-light group) and 1 case of itchy eyes in the control group.

Although this research shows that in the PD population, supplemental exposure to bright light improves excessive daytime sleepiness, "further study is needed to optimize the duration and exposure parameters of light therapy in the PD population," said Dr. Videnovic.

**Still Early**

Session chair, Bradley V. Vaughn, MD, professor, neurology, University of North Carolina School of Medicine, Chapel Hill, commented that it's still early days for interventions such as bright-light therapy in PD.

"We are still early in the process of trying to figure this out," he said. "However, from the results Dr. Videnovic presented here, clearly this is something that is encouraging and exciting."
Research has shown, both in animal models and in humans, that improving sleep and circadian rhythms has a positive effect on neurologic function, at least early on, added Dr. Vaughn.


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Cite this article: Light Therapy Effective for Daytime Sleepiness in PD. Medscape. Apr 29, 2014.