

Light Therapy Improves Sleep, Behavior in Alzheimer's Patients

Megan Brooks | June 06, 2014

MINNEAPOLIS — Light therapy tailored to increase circadian stimulation during the day has benefits for patients with Alzheimer's disease and related dementias living in long-term care facilities, a new study shows.

Investigators found that exposure to a bluish-white light source during the daytime for 4 weeks significantly increased sleep quality, efficiency, and total sleep time and reduced depression and agitation.

"It is a simple, inexpensive, nonpharmacological treatment to improve sleep and behavior in Alzheimer's disease and dementia patients," principal investigator Mariana Figueiro, PhD, associate professor and Light and Health program director of the Lighting Research Center at Rensselaer Polytechnic Institute in Troy, New York, said in a statement.

"The improvements we saw in agitation and depression were very impressive," she added.

The study was reported here at SLEEP 2014, the 28th annual meeting of the Associated Professional Sleep Societies.

Improved Sleep, Improved Behavior

"It's well known that Alzheimer's patients have a lot of trouble sleeping, they may wake at night and wander around, and this may contribute to institutionalization," Dr. Figueiro told *Medscape Medical News*.

Preliminary studies using light therapy have shown that appropriately timed light exposure can consolidate and improve nighttime sleep and increase daytime wakefulness and reduce evening agitation, she explained.

"Light levels are very high in nursing homes," Dr. Figueiro said, but since the human circadian system is more sensitive to short-wavelength (blue) light, lower, more targeted lighting interventions have therapeutic potential.

In a pilot study, she and her colleagues installed a light source producing low levels of 300 to 400 lux of a bluish-white light with a color temperature of more than 9000 K in the rooms of 14 nursing home patients with Alzheimer's disease and related dementia.

A Daysimeter worn on the wrist collected objective measures of sleep, rest/activity patterns, and circadian disruption before and during the lighting intervention. Measures of sleep quality, depression, and agitation also were collected by using standardized questionnaires.

Exposure to the tailored light treatment significantly increased global sleep scores on the Pittsburgh Sleep Quality Index, decreased depression scores on the Cornell Scale for Depression in Dementia, and decreased agitation scores from the Cohen-Mansfield Agitation Inventory.

Light exposure also significantly increased phasor magnitude, a measure of the 24-hour resonance between light-dark and activity-rest patterns, "consistent with an increase in circadian entrainment," said Dr. Figueiro.

Total sleep time and sleep efficiency (ratio of total time asleep and total time in bed) were also significantly greater after the light intervention than after baseline.

The improvements in sleep led to improvements in behavior. Subjective reports from the nursing staff indicated that patients were "calmer, eating better and their overall behavior was more manageable," Dr. Figueiro said. She said a larger study is needed to confirm these findings.

She noted that the light sources used in the study are sold as aquarium lamps "and more of these types of bluish-white light sources are coming on the market."

"One thing caregivers can do to improve sleep of Alzheimer's patients is to get them outdoors more, especially during the morning hours," Dr. Figueiro said.

Commenting on the study for *Medscape Medical News*, Christopher Winter, MD, said light may have other unknown effects in addition to its regulatory effect on sleep and wake cycles.

"We've known for a long time that light boxes are effective for seasonal affective disorder," he said.

Dr. Winter, who is medical director of the Martha Jefferson Hospital Sleep Medicine Center in Charlottesville, Virginia, and member of the American Academy of Sleep Medicine, also noted that in long-term care facilities, "rooms may be relatively dark and a lot of time these patients go from their bed to a chair next to the bed and sit there all day long. Moving these individuals to places with more light or bringing light to them probably would do wonders for them, not only in terms of their mood but also their sleep-wake cycle."

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