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Blue Light-Blocking Glasses May Help, Study Suggests

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CHICAGO — Lenses that filter blue light almost doubled nighttime melatonin levels, reduced awakenings, and enhanced at least one measure of cognition in a randomized controlled trial that assessed these outcomes in wearers of BluTech Lenses.

"The concept of harmful blue light has been gaining attention. Blue light is made out to cause many health problems," said Ryab-Quang Van, a student at Nova Southeastern University College of Optometry in Fort Lauderdale, Florida.

At Academy 2017, the Academy of Optometry's Annual Conference, Van reported that blue light-filtering lenses, which are touted to ameliorate these negative effects, may indeed provide some protection.

In the digital age, blue light exposure is hard to avoid, as the average person now spends the evening hours staring at one device or the other. "You wonder why you can't fall asleep," he said. "Blue light has been your enemy for the past few hours, we are told."

Intrinsically photosensitive retinal ganglion cells respond to short-wavelength light and contribute to circadian rhythm entrainment. Evening light exposure and/or changes in sleep/wake behavior can cause dysregulation of melatonin, which is associated with impaired mood and cognitive performance, he explained.

According to manufacturers, blue light-blocking lenses can ameliorate these putative negative effects. One such device is BluTech Lenses, which purport to block ultraviolet and blue light rays from digital devices, improve depth and color perception, improve visual acuity and night vision, improve contrast, and reduce glare.

Because BluTech Lenses are a popular product in this category, Van and colleagues chose to evaluate the efficacy of these glasses. The study was independently conducted.

Randomized, Crossover Study

The study examined the effects of modifying short-wavelength blue light exposure on evening melatonin levels, sleep onset, mood, and cognition in randomized controlled crossover trial. Twenty-four undergraduate students wore BluTech Lenses for 1 week and clear lenses with antireflective coating only (control) the next. The lenses were fitted into spectacle frames with blackout side shields and worn after 6:00 pm for 5 days (Monday - Friday).

The students also wore actigraphy watches, which noninvasively recorded sleep patterns each night. On the fifth evening, saliva samples were collected to quantify melatonin levels; self-reported mood and neurobehavioral performance were assessed with the National Institutes of Health Toolbox Emotion and Cognition batteries, respectively.

Increased Melatonin in BluTech Wearers

During the week they wore the BluTech lenses, participants had an increase in melatonin levels, less awakening during sleep, and evidence of improved cognition compared with the week they wore clear lenses, Van reported.

For wearers of BluTech Lenses, mean melatonin level was 9.6 pg/mL compared with 4.9 pg/mL for the control group ($P = .036$).

Sleep onset latency measured by actigraphy was slightly reduced with the BluTech Lenses, but was not statistically significantly different between glasses. Similarly, awakening after sleep onset and total number of awakenings did not differ between the groups, although a significant relationship was observed between increase in melatonin related to BluTech glasses and reduced awakenings ($P = .045$).

"Several people who took more than half an hour to fall asleep without the BluTech glasses reduced this time to 10 to 20 minutes, on average, when wearing the glasses," he noted.

One measure of cognition was significantly associated with BluTech Lenses (pattern comparison; $P = .03$), whereas other aspects of cognition were not significantly affected. During the week when subjects wore BluTech Lenses, improved pattern comparison test scores were significantly associated with a reduction in number of awakenings during sleep ($P = .047$), he said.

Senior investigator Ava Bittner, OD, PhD, also from Nova Southeastern University, commented that pattern comparison is an important surrogate for cognition. "It's a performance task that tells us how fast a person is reacting to stimuli in the environment, and it's a predictor of other cognitive issues."

The only aspect of mood that appeared to be affected was perceived hostility, which was significantly reduced with the BluTech Lenses ($P = .03$); however, change in melatonin and sleep quality were not related to this, and other factors could have confounded this outcome, Van acknowledged.

"Our conclusion is that BluTech Lenses appear to help regulate melatonin, which may improve sleep and cognition," Van said. "We are continuing data collection for this study to determine if the current findings are valid in a larger sample."

In an interview with *Medscape Medical News*, Dr Bittner said blue light–blocking glasses might be most useful to "at-risk" individuals such as shift workers, whose circadian rhythm is disrupted, and students (or anyone) working at their computers at night or simply spending time on devices. "If you can't give up those habits, you could use these glasses in the evening," she said. "I suggest putting them on 3 hours before bedtime to shift melatonin secretion."

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