Morning Blue Light Exposure May Help Treat PTSD
— Improving sleep may boost efficacy of current treatments

by Salynn Boyles, Contributing Writer

June 14, 2019

SAN ANTONIO -- Morning blue wavelength light exposure was associated with increased sleep duration and greater retention of fear extinction learning in people with post-traumatic stress disorder (PTSD) in a pilot study.

Early findings in 53 study participants with PTSD randomized to either blue or amber (control) morning light therapy suggest that blue wavelength light may prove to be an effective adjuvant to current PTSD therapies, said William Killgore, PhD, of the University of Arizona in Tucson.

Killgore presented the findings earlier this week at SLEEP 2019, the annual joint meeting of the American Academy of Sleep Medicine and the Sleep Research Society.

Weakening conditioned response through extinction learning is a hallmark of PTSD treatment, but Killgore explained that while people with the disorder respond to the therapy they often don't retain extinction memory.

He also noted that sleep disruption is a major symptom of PTSD in the vast majority of patients.

"It has been estimated that 90% of people who develop PTSD will complain about some sleep-related problem in the months and years following their trauma," he said.

For the study, Killgore explained that he and his colleagues hypothesized that improving sleep in PTSD could help patients recover from PTSD by improving their ability to consolidate and retain extinction memory learning. Memory consolidation is strongly
Consolidate and retain extinction memory learning. Memory consolidation is strongly influenced by sleep.

The team also hypothesized that exposing subjects to morning blue wavelength light could help ameliorate sleep problems related to PTSD.

Blue wavelength light suppresses the production of melatonin better than any other light color, and nighttime blue light has been shown to interfere with sleep.

But morning blue light exposure may do the opposite by "phase advancing" the circadian cycle, bringing about a positive shift in the rhythm of melatonin production, Killgore said.

After undergoing a well-validated fear conditioning and extinction protocol, the study subjects were randomized to receive 6 weeks of blue or placebo (amber) light therapy, self-administered at home via a light box for 30 minutes a day within 2 hours of waking.

The participants returned after the 6 weeks and were exposed to the same previously conditioned stimuli introduced in the early pre-light-therapy portion of the trial.

The researchers calculated extinction recall magnitude as the difference in skin conductance response between the "extinguished" and the "never-extinguished" stimuli.

Participants in the blue light group had increased sleep duration at follow-up relative to the amber light group, and showed greater sustained retention of extinction memory after 6 weeks (P=0.016).

Retention of extinction recall magnitude was found to be correlated with improvements in sleep, measured by the Insomnia Severity Index, in the blue group (r=0.44, P<0.05) but not in the amber group.

Killgore concluded that while the study has limitations and more research is needed to confirm the association, the findings suggest that morning blue light therapy may improve sleep.

"And that may, in turn, improve consolidation of extinction memory," he said, adding that this could positively impact current PTSD therapies such as prolonged exposure and cognitive behavioral therapy. "Morning blue light may actually augment some of these ongoing treatments and, perhaps, solidify the effects of the therapy so that they actually stick with the patient long after treatment is over," he said.

The study was funded by the U.S. Army Medical Research and Material Command.

Killgore reported having no relevant conflicts of interest related to the research.