Sleeping Too Much or Too Little and Erratic Sleep May Impair Stress Response in Youth with Bipolar Disorder

Social stress and poor sleep habits are quite common among healthy adolescents. But for youth with bipolar disorder, disrupted sleep carries particular risk: Insomnia and other sleep problems commonly precede episodes of mania or depression. There is even some preliminary evidence that treating these sleep problems can prevent the recurrence of mood episodes.

Now a new study suggests that when youth with bipolar disorder have disrupted sleep patterns it may impair the brain’s ability to regulate their hearts during stress; this could put teens with bipolar illness, already prone to sharp mood swings, at heightened risk for worse mental health. It’s a new body clue that suggests why adolescents with bipolar disorder may reap better mental health from practicing moderate, consistent sleeping habits.

Diagnoses of bipolar illness have been rising among youth in recent years—about 1.2 million adolescents in the U.S. alone have the disorder. The new study is published online ahead of print and will appear in a forthcoming issue of Psychosomatic Medicine, journal of the American Psychosomatic Society.

The scientists first tracked activity and rest cycles for one week using a portable wrist-worn device. Then they measured heart rate variability—how much the time between heart beats fluctuates—in 22 adolescents with bipolar disorder and 27 healthy peers. The parasympathetic branch of the nervous system regulates heart beats during rest, and stress can lead to blunting of this parasympathetic activity, even when resting. That blunting in turn reduces the variability between beats. And less heart rate variability is associated with risk for heart attacks, strokes and several mental illnesses, including bipolar disorder.

After the first week of real-world measurements of their sleep duration and variability, participants came into the lab for standardized public speaking and math tasks known to induce stress. The researchers measured youths’ heart rates during both rest and stress.

The goals were to see if shorter or longer durations of sleep, and greater variations in daily sleep duration, had any link to how the brain was regulating the heart during rest and stress. Another key question was whether this nervous system regulation of the heart
differed between healthy adolescents and those with bipolar disorder, says lead author Melynda Casement, PhD, Assistant Professor of Psychology at the University of Oregon. She collaborated with senior author Peter Franzen, PhD, Assistant Professor of Psychiatry and Clinical and Translational Science, and Director of the Sleep and Behavioral Neuroscience Center, and Tina Goldstein, PhD, Associate Professor of Psychiatry, at the University of Pittsburgh.

Youth with bipolar illness who slept very little or a great deal had lower (worse) heart rate variability during both rest and stress. “Think of this as the flexibility of the heart,” says Casement. “What we see in youth with bipolar disorder who get too much or too little sleep is that their hearts aren’t responding as flexibly,” which could mean that both short and long sleep may be affecting their nervous system, impairing their ability to deal with stress. For the healthy adolescents, the more they slept, the better their response to stress.

Another difference was that for youth with bipolar illness, heart rate variability was persistently lower than in the healthy teens. Also, after stress, more variability in the number of hours slept was associated with less healthy heart rate variability patterns during stress, suggesting a more persistent stress response.

“Our evidence suggests that social stress and sleep changes typical in adolescence could interfere with the body’s normal stress response systems, which may contribute to stress-related mood disruptions in adolescents with bipolar disorder,” says Casement. The next useful research step, the scientists suggest, would be to see whether improving sleep habits in bipolar teenagers improves their heart rate variability pattern and ability to adaptively respond to stress, and also prevents episodes of mania and depression.

Study Link: [http://doi.org/10.1097/PSY.0000000000000737](http://doi.org/10.1097/PSY.0000000000000737)

Faculty Page: [https://sleeplab.uoregon.edu/](https://sleeplab.uoregon.edu/)

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