Researchers study sleep apnea and lack of oxygen

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According to the National Heart, Lung and Blood Institute, the average sleep apnea sufferer stops breathing and loses oxygen between five and 30 times a night. This lack of oxygen leads to a host of complications, including high blood pressure, vascular disease, an abnormal heart rhythm, or even a fatal cardiac event. Now, a team of University of Missouri researchers is exploring the changes in distinct brain regions that contribute to these symptoms in hopes of combating this common health issue.

Sleep apnea occurs when the muscles in the back of the throat relax during sleep, leading the airway to narrow or close. It's estimated that 12 million Americans are affected by sleep apnea, but it's widely believed that the issue is under reported. There are no blatant signs or blood tests to diagnose the disrupted sleep. Most cases of sleep apnea are discovered when a partner notices an increase in snoring, or when the sufferer indicates daytime fatigue and sleepiness.

To learn more about sleep apnea, the National Institutes of Health awarded University of Missouri researchers a $2.83 million multi-investigator grant to continue work on neurohumoral control of the circulation and breathing– studying how the brain responds to hypoxia, or the lack of oxygen. The team includes Eileen Hasser, professor in the Department of Biomedical Sciences and adjunct professor of medical pharmacology and physiology; Cheryl Heesch, professor in the Department of Biomedical Sciences; and David Kline, assistant professor in the Department of Biomedical Sciences.

The researchers use an experimental model of lab rats that produces traits that mimic periodic sleep apnea. Using state-of-the-art techniques and equipment in the MU Dalton Cardiovascular Research Center, the researchers are able to identify specific cells and pathways within the brain that are involved in responses to hypoxia. Researchers hope the information can be used to develop drugs or procedures to correct or slow the dangerous effects of sleep apnea.

"Working together, we each bring different skills and ways of looking at the problem, which increases our ability to answer the important questions in this field," Hasser said.

While only in the first year of the four-year grant, the researchers have already advanced knowledge on how the brain adapts to diminished oxygen. Results of their initial experiments were recently published in the scientific journal, Neuroscience.

Provided by University of Missouri-Columbia