

Skipping sleep may signal problems for coronary arteries

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One extra hour of sleep per night appears to decrease the risk of coronary artery calcification, an early step down the path to cardiovascular disease, a research team based at the University of Chicago Medical Center reports in the Dec. 24/31 issue of *JAMA*. The benefit of one hour of additional sleep was comparable to the gains from lowering systolic blood pressure by 17 mm Hg.

About 12 percent of those in the study, healthy volunteers in their 40s, first developed coronary artery calcification over five years of follow-up. Calcified arteries, however, were found in 27 percent of those who slept less than five hours a night. That dropped to 11 percent for those who slept five to seven hours and fell to six percent for those who slept more than seven hours a night.

The benefits of sleep appeared to be greater for women. They did not vary according to race.

"The consistency and the magnitude of the difference came as a surprise," said study director Diane Lauderdale, PhD, associate professor of health studies at the University of Chicago Medical Center. "It's also something of a mystery. We can only speculate about why those with shorter average sleep duration were more likely to develop calcification of the coronary arteries."

Recent studies have suggested that chronic partial sleep deprivation may be a risk factor for an array of common medical problems, including

weight gain, diabetes and hypertension. One study found that both long and short self-reported sleep durations were independently associated with a modestly increased risk of coronary events. This is the first study to link objectively measured sleep duration to a pre-clinical marker for heart disease.

The research focused on 495 participants in the Coronary Artery Risk Development in Young Adults (CARDIA) study. An ongoing project begun in 1985, CARDIA was designed to assess the long-term impact of various factors on the development of coronary artery disease.

Participants underwent two electron beam computed tomography scans, designed to assess the buildup of calcium within the arteries that deliver blood to the heart muscle, five years apart.

They also filled out sleep questionnaires, kept a log of their hours in bed and participated in 6 nights of sleep studies with a technique called wrist actigraphy that uses a motion sensor--worn like a watch--to estimate actual sleep duration. This approach provides the most accurate measure of routine sleep behavior without subjecting the volunteers to the unfamiliarity of multiple sensors that determine sleep by monitoring brain activity.

In a previous study, Lauderdale and colleagues used actigraphy and nightly logs to study, on average, how long people spent in bed (7.5 hours), how long it took them to fall asleep (22 minutes), how long they slept (6.1 hours), and their total sleep efficiency--time asleep divided by time trying to sleep in bed (81 percent).

This time they looked at the connections between sleep duration and coronary artery calcification. They found more than they anticipated.

Previous studies have correlated decreased sleep times with established

risk factors for calcification, including high blood pressure, excess weight, and poor glucose regulation. But in this study, "after adjusting for age, sex, race, education, smoking, and apnea risk," the authors note, "longer measured sleep duration was associated with reduced calcification incidence."

The authors suggest three possible ways that shorter sleep could connect to calcification. First, there may be some factor not yet identified that can both reduce sleep duration and increase calcification. Second, although blood pressure measured during examinations did not seem to explain the association, blood pressure generally declines during sleep, so the 24-hour average blood pressure of those who sleep less may be higher, and that could lead to calcification. Finally, stress or a stress hormone like cortisol, which has been tied to decreased sleep and increased calcification, may play a role. Cortisol data were not available for all study participants.

"This was a small study and a new finding, so we would love to see it duplicated in another study population," Lauderdale said. "But there is enough here to make a point. Although there are constant temptations to sleep less, there is a growing body of evidence that short sleep may have subtle health consequences. Although this single study does not prove that short sleep leads to coronary artery disease, it is safe to recommend at least six hours of sleep a night."

Source: University of Chicago

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