Smoking linked to sleep disturbances

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New research shows that cigarette smokers are four times as likely as nonsmokers to report feeling unrested after a night's sleep. The study, appearing in the February issue of CHEST, the peer-reviewed journal of the American College of Chest Physicians (ACCP), also reveals that smokers spend less time in deep sleep and more time in light sleep than nonsmokers, with the greatest differences in sleep patterns seen in the early stages of sleep. Researchers speculate that the stimulating effects of nicotine could cause smokers to experience nicotine withdrawal each night, which may contribute to disturbances in sleep.

"It is possible that smoking has time-dependent effects across the sleep period," said study author Naresh M. Punjabi, MD, PhD, FCCP, Johns Hopkins University School of Medicine, Baltimore, MD. "Smokers commonly experience difficulty falling asleep due to the stimulating effects of nicotine. As night evolves, withdrawal from nicotine may further contribute to sleep disturbance."

Dr. Punjabi and colleagues from Johns Hopkins University School of Medicine compared the sleep architecture of 40 smokers with that of a matched group of 40 nonsmokers, all of whom underwent home polysomnography. Previous studies comparing smokers and nonsmokers have primarily used subjective measures of sleep; what makes this recent study unique is the study population, the use of objective measure of sleep, and the quantitative nature of the analysis. Unlike most studies on sleep comparing smokers and nonsmokers, Dr. Punjabi's study included smoking and nonsmoking subjects who were free of most medical comorbidities and medication use.

“Finding smokers with no health conditions was challenging. But in order to isolate the effects of smoking on sleep architecture, we needed to remove all factors that could potentially affect sleep, in particular, coexisting medical conditions,” said Dr. Punjabi. “In the absence of several medical conditions, sleep abnormalities in smokers could then be directly associated with cigarette use.”

An additional strength of this study was that sleep architecture was analyzed using both the conventional method of visual classification of electroencephalogram (EEG) patterns and through power spectral analysis of the EEG, which relies on a mathematical analysis of different frequencies contained within the sleep EEG.

“Previous sleep studies have relied on visual scoring of sleep stages, which is time-consuming and subject to misclassification,” said Dr. Punjabi. “Spectral analysis allows us to more objectively classify the sleep EEG signals and helps detect subtle changes that may have been overlooked with visual scoring.”

Visual scoring of sleep staging showed similar results between smokers and nonsmokers. However, spectral analysis showed that smokers had a lower percentage of delta power, or deep sleep, and a higher percentage of alpha power, or light sleep. When asked about sleep quality, 22.5 percent of smokers reported lack of restful sleep compared with 5.0 percent of nonsmokers. Spectral analysis also showed that the largest difference in sleep architecture occurred at the onset of sleep, which supports the premise that nicotine’s effects are strongest in the early stages of sleep and potentially decrease throughout the sleep cycle. The researchers speculate the results of their study may have significant future implications in the area of smoking cessation.

“Many smokers have difficulty with smoking cessation partly because of the sleep disturbances as a result of nicotine withdrawal,” said Dr.

Punjabi. “By understanding the temporal effects of nicotine on sleep, we may be able to better tailor nicotine replacement to minimize the withdrawal effects that smokers experience, particularly during sleep.” Smokers also reported more caffeine use than nonsmokers. However, caffeine consumption was not associated with the results of the EEG spectral analysis or lack of restful sleep.

“The long-term effects of smoking on respiratory and cardiovascular health are well-known,” said Alvin V. Thomas, Jr., MD, FCCP, and President of the ACCP. “However, this study is significant because it suggests that smokers may also be deprived of the much-needed restorative effects of sleep. This study provides yet one more reason to stop smoking or to never start.”

Source: American College of Chest Physicians