Medical Xpress

Sleep-disordered breathing may increase risk of cognitive impairment, dementia among older women

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Older women with sleep-disordered breathing, as indicated by measures of hypoxia (oxygen deficiency), were more likely to develop cognitive impairment or dementia than women without this disorder, according to a study in the August 10 issue of *JAMA*.

"Sleep-disordered breathing, a disorder characterized by recurrent arousals from sleep and intermittent hypoxemia, is common among older adults and affects up to 60 percent of elderly populations. A number of adverse health outcomes including hypertension, cardiovascular disease, and diabetes have been associated with sleep-disordered breathing," according to background information in the article. Cognitive impairment also has been linked to sleep-disordered breathing in some studies, but the design of most of these studies has limited the ability to draw conclusions regarding this association. "Given the high prevalence and significant morbidity associated with both sleep-disordered breathing and cognitive impairment in older populations, establishing whether a prospective association exists between sleep-disordered breathing and cognition is important. This is especially important because effective treatments for sleep-disordered breathing exist."

Kristine Yaffe, M.D., of the University of California, San Francisco, and colleagues examined the association between prevalent sleep-disordered breathing as measured with polysomnography (monitoring of physiological activity during sleep) and subsequent diagnoses of mild

cognitive impairment and dementia. The study included 298 women without dementia at the beginning of the study (average age, 82.3 years) who had overnight polysomnography measured between January 2002 and April 2004 in a substudy of the Study of Osteoporotic Fractures. Sleep-disordered breathing was defined as an apnea-hypopnea index of 15 or more events per hour of sleep. The apnea-hypopnea index is the number of complete cessations (apnea) and partial obstructions (hypopnea) of breathing occurring per hour of sleep. Cognitive status (normal, dementia, or mild cognitive impairment) was based on data collected between November 2006 and September 2008. Measures of hypoxia, sleep fragmentation, and sleep duration were investigated as underlying mechanisms for any association between sleep-disordered breathing and cognitive impairment.

Among the 298 women, 35.2 percent met criteria for sleep-disordered breathing. After an average of 4.7 years of follow-up, 35.9 percent of the women developed mild cognitive impairment or dementia (mild cognitive impairment: 20.1 percent; dementia: 15.8 percent). Forty-seven women (44.8 percent) with prevalent sleep-disordered breathing developed mild cognitive impairment or dementia compared with 31.1 percent of those without sleep-disordered breathing. Analysis of the data indicated that the presence of sleep-disordered breathing was associated with an increased odds of subsequent mild cognitive impairment or dementia.

The researchers also found, after adjusting for various demographic risk factors, that two measures of hypoxia (an oxygen desaturation index of 15 or greater and a high percentage of total sleep time [greater than 7 percent] in apnea or hypopnea) were associated with higher incidence of mild cognitive impairment or dementia. "Measures of sleep fragmentation (arousal index and wake after sleep onset) or sleep duration (total sleep time) were not associated with risk of cognitive impairment." The authors add that their finding that sleep-disordered

breathing was associated with an increased risk of cognitive impairment seems to be related primarily to measures of hypoxia.

"Given the high prevalence of both sleep-disordered breathing and cognitive impairment among older adults, the possibility of an association between the 2 conditions, even a modest one, has the potential for a large public health impact. Furthermore, the finding that hypoxia and not sleep fragmentation or duration seems to be associated with risk of mild cognitive impairment or dementia provides clues to the mechanisms through which sleep-disordered breathing might promote cognitive impairment. The increased risk for cognitive impairment associated with sleep-disordered breathing opens a new avenue for additional research on the risk for development of mild cognitive impairment or dementia and exploration of preventive strategies that target sleep quality including sleep-disordered breathing," the researchers write.

They add that to fully evaluate the impact of treatment for sleep-disordered breathing in elderly populations, additional trials with larger sample sizes, longer treatment periods, and more diverse populations are required. "Of interest, our findings suggest a potential role for supplemental oxygen therapy for sleep-disordered breathing in elderly individuals; however, its role requires critical evaluation in intervention studies."

More information: *JAMA*. 2011;306[6]613-619.

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