Lively Limbs Limit Sleep in Cognitively Impaired

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Frequent nighttime leg movements were significantly associated with sleep disturbance and less total sleep in a study of 102 elderly people with cognitive impairment.

Previous research had shown that sleep time varies from approximately 6 to 10 hours in nursing home residents who have moderate to severe cognitive impairment, and that this sleep is quite fragmented.

However, an association between periodic limb movements in sleep and total sleep time in older people with cognitive impairment hadn't been established.

The nature of the association—which emerged both among people living in nursing homes and in those in the community—remains unclear.

Kathy C. Richards, Ph.D., of the Polisher Research Institute, Horsham, Pa., and her colleagues measured sleep variables in 58 men and 44 women of average age 82 years. Of those, 66 people lived in nursing homes or assisted-living facilities and the rest resided at home.

The participants scored an average of 17.3 on the Mini-Mental State Examination (MMSE), in which a score of 30 signifies the highest cognitive function.

The exam rated seven people as having profound cognitive impairment, 14 with severe cognitive impairment, and 33 within the criteria for moderate cognitive impairment. The test rated 21 people as mildly impaired and 27 with early cognitive impairment.

The researchers then used polysomnography to collect data on variables including leg movement, oxygen saturation, time spent in bed, total sleep time, and the apnea-hypopnea index. The team conducted the test during 1 night in each person's usual sleep setting.

The study participants averaged 5.5 hours of total sleep time, ranging from

less than 1 hour to nearly 9 hours. Although the average time spent in bed was 8 hours, only 67% of that time was spent sleeping, and nonrapid eye movement sleep made up 87% of the total sleep time. The study subjects awoke an average of 34 times during the night, but only an average of 1.8 awakenings was related to leg movements (Sleep 2008;31:224-30).

Participants' scores on the Periodic Leg Movement Index (PLMI) ranged from 0 to 112, with an average of 17. A total of 34 persons (33%) had PLMI scores greater than 15, which is the cutoff point for a diagnosis of periodic limb movement disorder.

Overall, people with a PLMI greater than 15 experienced significantly more minutes awake; less total sleep time and nonrapid eye movement sleep; less sleep efficiency; and a lower apnea-hypopnea index than did study participants with lower PLMI.

When the researchers controlled for multiple variables, a combination of time spent in bed, older age, and higher PLMI accounted for 44% of the study population's variance in total sleep time.

On the other hand, the analysis found no relationship between PLMI and other sleep variables or participants' age or MMSE scores.

The study showed no significant difference in total sleep time between people in private homes and those in nursing homes or assisted-living facilities.

"This was surprising considering the pervasive nursing care practices in nursing homes of awakening residents for incontinence and other care and the noise from other residents and staff," the researchers noted.

"An elevated PLMI was associated with a consistent pattern of sleep disturbance, suggesting that [periodic leg movements] or other related comorbidities, such as restless leg syndrome, may be a cause for poor sleep in elders with cognitive impairment," Dr. Richards and her colleagues wrote.

In a statement, Dr. Richards called that finding "important because treatment of periodic leg movements may result in improved nighttime sleep and improved quality of life in this vulnerable population."

The study was limited by a lack of data on the potential role of upper airway resistance as a cause of nighttime leg movement, according to Dr. Richards and her colleagues.

Dr. Richards has received research support from Beverly Healthcare Corp., but the study had no industry sponsorship. ■