# Popular sleep medicine puts older adults at risk for falls, cognitive impairment

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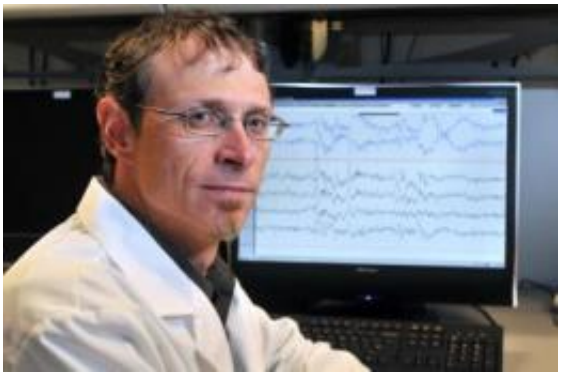

A new study led by CU-Boulder Associate Professor Kenneth Wright, above, indicates a common sleep medication puts adults more at risk for nighttime falls and potential injuries. Credit: Photo by Patrick Campbell/University of Colorado

Adults who take one of the world's most commonly prescribed sleep medications are significantly more at risk for nighttime falls and potential injury, according to a new study by the University of Colorado at Boulder.

The study, which involved 25 healthy adults, showed 58 percent of the older adults and 27 percent of the young adults who took a hypnotic, sleep-inducing drug called zolpidem showed a significant loss of balance when awakened two hours after sleep. The findings are important because falls are the leading cause of injury in older adults, and 30 percent of adults 65 and older who fall require hospitalization each year,

said CU-Boulder Associate Professor Kenneth Wright, lead study author.

To measure balance, the research team used a technique known as a "tandem walk" in which subjects place one foot in front of the other with a normal step length on a 16-foot-long, six-inch-wide beam on the floor. In 10 previous practice trials with no medication, none of the 25 participants stepped off the beam, indicating no loss of balance. All participants were provided with stabilizing assistance to prevent falls during the trials, he said.

"The balance impairments of older adults taking zolpidem were clinically significant and the cognitive impairments were more than twice as large compared to the same older adults taking placebos," said Wright, a faculty member in the integrative physiology department. "This suggests to us that sleep medication produces significant safety risks."

The new CU-Boulder study is the first to measure both the walking stability and cognition of subjects taking hypnotic sleep medicines or placebos. In addition to the balance problems caused by zolpidem, the study also showed that waking up after two hours of sleep after taking zolpidem enhances sleep inertia, or grogginess, a state that temporarily impairs working memory. The study participants were given computerized performance tests that involved adding randomly generated numbers.

A paper on the subject was published Jan. 13 in the *Journal of the American Geriatric Society*. Co-authors included CU-Boulder's Daniel Frey, Justus Ortega, Courtney Wiseman and Claire Farley. The study was funded primarily by the National Institutes of Health.

The effects of sleep inertia even without sleep medication has previously

been shown to cause cognitive impairment, said Wright. But when the CU-Boulder study subjects took zolpidem rather than a placebo, the cognitive impairments essentially doubled.

One unexpected study finding was that young people taking placebos appear to be more cognitively impacted by sleep inertia than older adults taking placebos, he said.

A 2006 study led by Wright showed that study subjects who took no sleep medicine and were awakened after eight hours of sleep were more cognitively impaired, for a short period of time, than a totally sleep deprived person.

Several billion doses of zolpidem have been prescribed worldwide, said Wright, who also directs CU-Boulder's Sleep and Chronobiology Laboratory. Zolpidem is a generic drug that is marketed under a number of different brand names, including Ambien, Zolpimist, Edluar, Hypogen, Somidem and Ivedal.

The CU-Boulder team also measured balance and cognition in older adults who took no sleep medication and were kept awake for two hours past their normal bedtime. They found that 25 percent of these older adults failed the tandem walking balance test, which is consistent with what is seen in people who have insomnia. "Just having insomnia itself increases your risk of falls, even without sleep medication," he said.

The finding that zolpidem affected older adults more than younger adults in balance tests may be explained in part by the fact that both groups were given five milligram doses on study nights. While the normal dose for older adults is five milligrams, the standard dosage for younger adults being treated for insomnia is 10 milligrams. "This is an area that needs more study," he said.

The study results showing that both hypnotic sleep medications and sleep inertia cause significant impairment have important public health implications, said Wright. In older adults, falls have caused millions of nonfatal injuries annually and more than 300,000 fatalities worldwide. "Falls can be very debilitating, especially when older people break their hips and require hospitalization, causing their quality of life to go down," said Wright.

In addition, the cognitive impairments caused by both zolpidem and sleep inertia may impact decision-making, including responding to situations like fire alarms and medical emergencies as well as caring for sick children or driving to a clinic or hospital, said Wright.

"One of the goals of this study was to understand the risk of this sleep medication and of sleep inertia on human safety and cognition and to educate adults and health care workers about potential problems," said Wright. "We are not suggesting that sleep medications should not be used, because they have their place in terms of the treatment of insomnia."

One possible solution to reducing falls of older people due to zolpidem, other sleep medications or sleep inertia would be to install bedside commodes for those who frequently wake up in the night to void themselves, said Wright. Additional research is needed on this important public health and safety topic, he said.

Provided by University of Colorado at Boulder