

Alcohol's disruptive effects on sleep may be more pronounced among women

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Researchers have known for decades that alcohol can initially deepen sleep during the early part of the night but then disrupt sleep during the latter part of the night; this is called a "rebound effect." A new study of the influence of gender and family history of alcoholism on sleep has found that intoxication can increase feelings of sleepiness while at the same time disrupt actual sleep measures in healthy women more than in healthy men.

Results will be published in the May 2011 issue of *Alcoholism: Clinical & Experimental Research* and are currently available at Early View.

"It's clear that a substantial portion of the population uses alcohol on a regular basis to help with [sleep](#) problems," said J. Todd Arnedt, assistant professor of psychiatry and neurology at the University of Michigan and lead author of the study. "This perception may relate to the fact that alcohol helps people fall asleep quickly and they may be less aware of the disruptive effects of alcohol on sleep later in the night."

Arnedt said that his group decided to examine gender differences in the effects of alcohol on sleep because very few alcohol administration studies have included female participants and, since women metabolize alcohol differently than men, it seemed reasonable to expect differences by gender.

"Our decision to examine [family history](#) was based on some observational studies showing different sleep characteristics among

family-history positive participants compared to family-history negative participants," he explained. "Family-history positive individuals also seem to be more resistant to the acute intoxicating effects of alcohol than individuals without a family history of alcoholism."

Arnedt and his colleagues recruited 93 healthy adults (59 women, 34 men) in their twenties through advertisements in the Boston area, 29 of whom had a positive family history of alcoholism. Between 8:30 and 10:00 p.m., participants consumed either a placebo beverage or alcohol to the point of [intoxication](#) as determined by breath alcohol concentration (BrAC). Their sleep was then monitored with polysomnography between 11:00 p.m. and 7:00 a.m. Participants also completed questionnaires at bedtime and upon awakening.

"Alcohol increased self-reported sleepiness and disrupted sleep quality more in women than men," said Arnedt. "Sleep quality following alcohol did not differ between family-history positive and family-history negative subjects. Morning ratings of sleep quality were worse following alcohol than placebo. Findings also confirmed results from other studies that a high dose of alcohol solidifies sleep in the first half of the night, meaning more deep sleep, but disrupts it in the second part of the night, meaning more wakefulness."

With respect to gender differences, women objectively had fewer hours of sleep, woke more frequently and for more minutes during the night, and had more disrupted sleep than men.

"These differences may be related to differences in alcohol metabolism," explained Arnedt, "since women show a more rapid decline in BrAC following alcohol consumption than men. It is important to note that the peak BrACs were equivalent between men and women in our study so the findings are not due to higher BrACs among the female subjects. We also do not believe that the differences were due to differences in

alcohol experience because the prior alcohol use was also equivalent between the men and women."

In summary, said Arnedt, this study's primary contribution was to demonstrate that the effects of [alcohol](#) on objectively measured sleep quality are different between men and women at equivalent BrACs.

"These findings may have implications for future studies examining the relationship between sleep quality and risk for the development of [alcohol](#) use disorders, as well as studies evaluating how sleep quality relates to relapse among recovering alcoholic individuals," he said.

Provided by Alcoholism: Clinical & Experimental Research

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