Alcohol exposure during adolescence leads to chronic stress vulnerability

24 May 2016

Linda Spear, distinguished professor of psychology at Binghamton University. Credit: Jonathan Cohen/Binghamton University

Drinking during early to mid-adolescence can lead to vulnerability to chronic stress, according to new research from Binghamton University, State University of New York.

A research team led by Linda Spear, distinguished professor of psychology at Binghamton University, gave alcohol to rats every other day, starting from early to mid-adolescence. When the team looked at the same rats in adulthood, they found that adult males didn't show hormonal stress adaptation, making them more vulnerable to chronic stress.

"Stress hormones are released when you get anxious or are in a stressful circumstance," said Spear. "The classic stress hormone is cortisol in humans; it's corticosterone in rats. When you expose the animals to a stressor, the first time they show a large hormone stress response. However, this hormonal response normally adapts over time, such that less hormone is released following repeated exposure to a relatively mild stressor. And that's important, because cortisol or corticosterone helps you respond to an emergency. But it's bad to have elevated levels in the long term, because sustained elevations in these levels of these hormones have adverse effects on a lot of body systems. So cortisol is needed for emergencies, but you don't want it elevated all the time. And what we found is that following adolescent alcohol exposure, adults don't show that hormonal stress adaptation. They don't adapt to the chronic stressor, which suggests that they may be more vulnerable later to chronic stress."

Spear's work is a part of a national consortium, funded by the National Institute of Alcohol and Alcohol Abuse, that's examining, using animal models, the effects of alcohol exposure during adolescence.

"I think what these studies are showing is that there are long-lasting effects from adolescent alcohol exposure, and it is not innocuous. And these effects are most dramatic with exposures during mid- and early adolescence, which is the time when alcohol use is typically initiated in humans. So now we're trying to understand the neural mechanisms that underlie these effects, and ways to prevent or reverse consequences of adolescent alcohol exposure," said Spear.

More information: Elena I. Varlinskaya et al, Chronic intermittent ethanol exposure during adolescence: Effects on stress-induced social alterations and social drinking in adulthood, *Brain Research* (2016). DOI: 10.1016/j.brainres.2016.03.050

Provided by Binghamton University