Alcohol on the brain [1]

Dear Alice,

I was wondering the rate at which alcohol induces brain damage; I know that over a course of years damage occurs, but does anything happen after about a month of drinking on weekends?

Answer

Dear Reader,

You pose a question that gets right to the heart of what is and isn’t known about the effects of alcohol on the brain. What is known is that chronic alcohol exposure is shown to contribute to brain damage in humans, and even moderate or lower risk [2] alcohol exposure has shown to contribute to some brain shrinkage. However, low-risk doesn’t mean no risk. Even social drinkers, such as those who only drink on weekends, may experience some neurological changes. Though abiding by the low-risk alcohol consumption helps to reduce the risk of negative health consequences, some people may still be at risk even when consuming alcohol within the recommendations (due to a variety of factors that can include age, sex assigned at birth, how quickly alcohol is consumed, and other health issues). Each individual differs in alcohol tolerance and the ways the brain and body will react to varying amounts of alcohol.

To understand how alcohol affects the brain, it may help to break down what happens on a biological level. When alcohol enters the body, it travels through the lining of organs and enters the bloodstream. From there, the liver takes control and tries to remove the toxins from the blood. There is only so much processing the liver can do, however, so excess alcohol then travels directly to the brain. In the brain, alcohol impacts three neurotransmitter receptor sites: GABA, glutamate, and dopamine. These interactions with receptor sites result in the slowed physical reactions and feelings of euphoria associated with drinking. Even at low levels, alcohol may prevent neurogenesis (the production of new brain cells from stem cells) or directly damage neurons themselves.

Drinking only on the weekends for one month may not lead to permanent damage to your grey and white matter, but this would somewhat depend on how much drinking you’re talking about: a glass of wine with dinner and a cocktail at brunch is different than an entire six-pack of beer while watching a three-hour sporting event. Even if you only drink on the weekends for a month, if
during those times you drink enough to blackout or have difficulty remembering events after drinking, there may be more impacts on the brain than if you only had one drink every couple of days. Memory impairments aren’t the only concern for occasional or moderate drinkers. Alcohol intoxication is also associated with riskier behavior, such as drunk driving or unprotected sex, as well as injury from violence or falling. Finally, heavy and chronic drinking can lead to disorders such as Wernicke-Korsakoff syndrome (WKS). WKS is associated with symptoms such as confusion, forgetfulness, and eye muscle paralysis. Many people who use alcohol heavily have a thiamine (vitamin B1) deficiency, and alcohol prevents the absorption and use of thiamine in the body, leading to the development of WKS. Other long-term impacts of alcohol on the brain include brain shrinkage, white matter loss (which affects your cerebellum — the coordination center of the brain), and liver damage. Even with low-frequency drinking, alcohol may have long-lasting effects on your brain.

The good news is that some of the damage that occurs from drinking may be mitigated by reducing how much you drink or even stopping drinking all together. People who detox from alcohol after heavy usage have shown improvements in their cognitive abilities. If abstinence isn’t for you, you may consider reducing the amount you drink in one setting.

The bottom line is that there are many unknowns in this arena. Research can’t tell you what your unique response to alcohol may be in the immediate or distant future. It also hasn’t yet identified all the mechanisms of neurogenesis, brain development, or all of the factors that can go into brain degeneration. Depending on a number of factors, your experiences with alcohol may look different than the friend you drink with on the weekends. You may consider taking steps to reduce your risk of getting alcohol poisoning when you drink — drinking plenty of water, eating before you go out to drink, and having a buddy present to help you stick to your drinking plan can all help. For more information, check out the Go Ask Alice! Alcohol [3] category.

Cheers!

Alice!

Category:
Alcohol & Other Drugs [4]
Alcohol [3]

Related questions

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How can I help my family member who struggles with alcohol? [7]
Alcohol poisoning [8]
Help for friends who drink too much [9]
How do I drink in moderation? [10]

Resources

Columbia Health BASICS program (Morningside) [11]
Medical Services (Morningside) [12]