

Why are men more susceptible to alcoholism?

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Alcohol is one of the most commonly abused substances, and men are up to twice as likely to develop alcoholism as women. Until now, the underlying biology contributing to this difference in vulnerability has remained unclear.

A new study published in <u>Biological Psychiatry</u> reveals that dopamine may be an important factor.

Researchers from Columbia and Yale studied male and female collegeage social drinkers in a laboratory test of <u>alcohol consumption</u>. After consuming an alcoholic or non-alcoholic drink, each participant underwent a specialized positron <u>emission tomography</u> (PET) scan, an imaging technique that can measure the amount of alcohol-induced dopamine release.

Dopamine has multiple functions in the brain, but is important in this context because of its pleasurable effects when it is released by rewarding experiences, such as sex or drugs.

Despite similar consumptions of alcohol, the men had greater dopamine release than women. This increase was found in the ventral striatum, an area in the brain strongly associated with pleasure, reinforcement and addiction formation.

"In men, increased dopamine release also had a stronger association with subjective positive effects of <u>alcohol intoxication</u>," explained Dr. Nina Urban, corresponding author for this study. "This may contribute to the



initial reinforcing properties of alcohol and the risk for habit formation."

Dr. Anissa Abi-Dargham, senior author on this project, notes that "another important observation from this study is the decline in alcoholinduced dopamine release with repeated heavy drinking episodes. This may be one of the hallmarks of developing tolerance or transitioning into habit."

These findings indicate that the ability of alcohol to stimulate <u>dopamine</u> release may play an important and complex role in its rewarding effects and abuse liability in humans. This identification of an in vivo neurochemical mechanism that could help explain the sex difference in alcoholism is an exciting step forward in alcoholism research.

More information: "Sex Differences in Striatal Dopamine Release in Young Adults After Oral Alcohol Challenge: A Positron Emission Tomography Imaging Study With [11C]Raclopride" by Nina B.L. Urban et al. The article appears in *Biological Psychiatry*, Volume 68, Issue 8 (October 15, 2010).

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