Brain patterns may help predict relapse risk for alcoholism

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(Medical Xpress)—Distinct patterns of brain activity are linked to greater rates of relapse among alcohol dependent patients in early recovery, a study has found. The research, supported by the National Institutes of Health, may give clues about which people in recovery from alcoholism are most likely to return to drinking.

"Reducing the high rate of relapse among people treated for alcohol dependence is a fundamental research issue," said Kenneth R. Warren, Ph.D., acting director of the National Institute on Alcohol Abuse and Alcoholism (NIAAA), part of NIH. "Improving our understanding of the neural mechanisms that underlie relapse will help us identify susceptible individuals and could inform the development of other prevention strategies."

Using brain scans, researchers found that people in recovery from alcoholism who showed hyperactivity in areas of the prefrontal cortex during a relaxing scenario were eight times as likely to relapse as those showing normal brain patterns or healthy controls.

The prefrontal brain plays a role in regulating emotion, the ability to suppress urges, and decision-making. Chronic drinking may damage regions involved in self-control, affecting the ability to regulate cravings and resist relapse.

Findings from the study, which was funded by NIAAA, appear online at the *JAMA Psychiatry* website.

Relapse is common among those trying to overcome alcohol dependence and is often triggered by stress and exposure to events or places that the individual associates with alcohol. Studies suggest that most people in recovery from alcoholism relapse at least once before they successfully quit drinking.

Using functional magnetic resonance imaging, a technique that allows researchers to measure localized changes in brain activation, scientists at Yale University compared the brain activity patterns of 45 patients who were about to successfully complete an inpatient treatment program for alcoholism to those of 30 people with no history of alcoholism. While undergoing brain scans, participants were asked to imagine relaxing situations such as sunning on a beach, as well as recent stressful situations. The patients in recovery were then followed for 90 days after leaving treatment to determine how many had returned to drinking.

The investigators found that individuals in recovery who showed patterns of heightened activity in the prefrontal region during the relaxing situation were much more likely to experience cravings for alcohol and subsequent relapse. These patterns of craving-related activity increased the likelihood of early relapse by 8.5 times and relapse to heavy drinking by 8.7 times. Abnormally low activity during the stressful scenario was also linked to greater number of days drinking after relapse.

Among the alcohol-dependent patients in this study, 30 percent had relapsed two weeks after leaving treatment, 46 percent had relapsed at the end of one month, and 71 percent had returned to drinking at the final three-month follow-up.

"The patterns of brain activity we observed may one day serve as a neural marker that could help clinicians identify alcohol-dependent patients in recovery who are most at risk of relapse," said Rajita Sinha, Ph.D., the study's senior author, who is Foundations Fund Professor of

Psychiatry and Professor in the Child Study Center and of Neurobiology at Yale University.

"Our findings may also have implications for the use of medications and behavioral treatments that restore prefrontal function, as they could potentially benefit people at high risk of relapse," Dr. Sinha said.

More information: Seo, D. et al. Disrupted ventromedial prefrontal function, alcohol craving, and subsequent relapse risk. *JAMA Psychiatry*, 2013 May 1.

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