Title: Identifying neurocognitive markers of alcohol use disorder risk.

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Abstract: Background. Inhibitory control (IC; the ability to stop a thought or action that has been planned) is a risk-factor for the transition of 'social' drinking to alcohol dependence. Functional magnetic resonance imaging (fMRI) studies suggest that decreased activity in the right inferior frontal gyrus (rIFG) is related to both poor IC during alcohol intoxication and laboratory measures of alcohol use. However, the relationship between rIFG activation during alcohol intoxication and future alcohol use is unknown and there is extant literature of how executive function (EF) ability predicts deficits in IC during alcohol intoxication. Aims. To examine how rIFG activity during alcohol intoxication predicts future alcohol use, and explore whether EF ability affects deficits in IC during alcohol intoxication. Hypotheses. Decreased activation in the rIFG during alcohol intoxication will: (1) be associated with greater deficits in inhibitory control, and; (2) predict future alcohol use. Decreased EF ability will be associated with poor IC during alcohol intoxication. Methods. First, participants complete two fMRI scans (alcohol or saline administration). An IC task is administered during a blood oxygen level dependent (BOLD) fMRI sequence to assess brain activation related to IC. Alcohol use data is collected through online surveys over 2 years to measure alcohol use. Lastly, participants complete the IC task and EF tasks after consuming a standard oral dose of alcohol. fMRI data analysis will be accomplished using previously validated methods. Statistical models will be used to test the relationships between rIFG activation and IC task performance, as well as future drinking. The effects of EF abilities on IC will be tested using moderation analysis. Importance. Identifying the cognitive correlates of the transition of social to hazardous alcohol use is critical for understanding the development of alcohol use disorders and may ultimately inform prevention strategies.

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