

PREFRONTAL GRAY MATTER VOLUME RELATES TO SUBSEQUENT CHANGES IN ALCOHOL USE IN COLLEGE AGE SOCIAL DRINKERS

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Purpose: Prospective studies suggest that lower gray matter volume in prefrontal cortex, including the anterior cingulate, in substance-naive, young adolescents predicts alcohol use and associated problems in middle to late adolescence. However, more work is needed investigating neuroanatomical risk markers in young adults, an epoch when alcohol use disorders commonly emerge.

Methods: This preliminary prospective study investigated whether variation in prefrontal gray matter volume in college age social drinkers relates to subsequent changes in typical alcohol use patterns.

Data: At baseline, typically developing young adults (N=14, 79% female, age_{mean±stdev}=21±2 years) with no history of alcohol use disorders completed the Time Line Follow Back to determine average number of drinks consumed per drinking day over the past month. Structural magnetic resonance imaging (MRI) was conducted to measure prefrontal gray matter volume. We used a region of interest analysis, focusing on the orbitofrontal and anterior cingulate cortex (ACC). All participants completed the Time Line Follow Back again, on average one year following baseline assessment, to determine average number of drinks consumed per drinking day over the past month. This preliminary analysis investigated whether variation in baseline orbitofrontal and ACC gray matter volume relates to changes in average number of drinks consumed per drinking day during the one year follow-up period.

Results: On average, participants consumed 2.5 drinks per drinking day at baseline assessment. Seven participants (50%) showed an increase in the number of drinks consumed per drinking day, while the other seven participants decreased the amount they drank. Controlling for average number of drinks per drinking day at baseline, lower left and right ACC gray matter volume correlated with an increase in the average number of drinks consumed per drinking day during the one-year follow-up period (p 's<0.05).

Conclusion: Results from this ongoing preliminary study suggest a relation between lower ACC gray matter volume and subsequent increase in quantity of alcohol use in young adult social drinkers. Longer longitudinal follow-up, with a larger sample size and inclusion of individuals showing signs of risky alcohol use, is necessary to assess for changes in alcohol use and risk/resiliency for the development of alcohol-related problems.