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Relationships Between GABRA2, Alcohol, and Peer Deviance

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The aim of this study is to measure the association between the frequency of alcohol use and the GABRA2 gene, as well as the potential moderating effect of peer deviance in college freshmen at Virginia Commonwealth University (VCU). This study is important because it could reveal how influential ones peers can be on future alcohol use disorders, and if variation in GABRA2 makes one more susceptible to alcohol related disorders than the general population. A similar study from Psychiatric Genetics tested for the susceptibility of alcohol dependence and association with GABRA2 by examining six SNPs on GABRA2 in German alcohol dependent patients against a control group of healthy individuals. These studies are important building blocks for the creation of preventative programs and early recognition. The more that is understood about the genetic and environmental risk factors for alcoholism, the better they can be prevented or controlled for.

Objectives:
- Test 8 SNPs in GABRA2 for association with alcohol consumption frequency.
- Test for moderation of the association between GABRA2 and alcohol use frequency as a function of peer deviance.

**Methods**

Eight single nucleotide polymorphisms (SNPs), or variations in single base pairs in DNA sequences, in the GABRA2 gene were chosen to be tested for association with alcohol use frequency. VCU freshmen in Spring 2011 voluntarily answered a series of questions about the level of peer deviance in their high school and college friends, along with their frequency in alcohol use in the past 30 days. A peer deviance sum score was created from the following questions: “How many of your friends have ever done the following: smoked cigarettes, got drunk, had problems with alcohol, drunk alcohol, been in trouble with the law, or smoked marijuana?”, with the options none, a few, some, most, and all. Alcohol frequency was measured by asking, “How often do you have a drink containing alcohol?”, with response options of never, monthly or less, 2-4 times a month, 2-3 times a week and 4 or more times a week. Linear regression analysis of the results from a sample of 786 eligible participants was used to determine the relationship between the variables. DNA samples were gathered by voluntary spit donations from survey participants and genotyped on Affymetrix Axiom Biobank Arrays.

**Results**

The regression analysis results show zero correlation between GABRA2 genotypes and the frequency of alcohol consumption. There was also no moderating effect of peer deviance on the relationship between alcohol use and GABRA2 variation. However, when testing for the covariates we found that age was statistically significant in that the older participants consumed higher levels of alcohol.

**Conclusions**

Although the results did not show a significant correlation, further genotype testing using older participants or different SNPs should be done in order to investigate the effects of GABRA2 variation on alcohol consumption as well as peer deviance as a potential moderating effect.

In the literature, the GABRA2 gene is associated with more harsh alcohol use and disorders such as alcohol dependence, as was outlined in the German alcohol dependent studies conducted by researchers at the University of Mainz. Our sample consists of individuals that are typically under legal drinking age, thereby limiting access to more severe alcohol related outcomes. Our study is among the first to examine this relationship of GABRA2 variation and alcohol consumption frequency in college-aged students transitioning to adulthood.

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