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THE ASSOCIATION BETWEEN GENERALIZED ANXIETY DISORDER AND ALCOHOL ABUSE AND DEPENDENCE

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Generalized Anxiety Disorder (GAD) is a chronic disorder that is often comorbid with other psychiatric disorders (Ballenger et al., 2001; Grant, Hasin, Stinson, et al. 2005)

The association between GAD and Alcohol Use Disorders (AUD) has received attention due to the possibility that individuals with GAD may resort to alcohol for self-medication (Grant et al., 2005)

In a population based study, 65% of males and 32.8% of females with a lifetime GAD diagnosis also had a lifetime AUD diagnosis (Vesga-Lopez et al. 2008)
OBJECTIVE

To characterize the association between GAD and alcohol use disorders, and to determine whether depression is a moderator of this association.
METHODS - SAMPLE

- Family study of Missouri residents (MOFAM)
- Over-sampled for African American (AfAm) race (>50% AA)
- Three risk groups based on paternal excessive alcohol use:
  - Recurrent drunk driving (RDD; ascertained from driving records), Maj. n=267, AfAm n=151
  - High risk (mother of children reported father drank excessively), Maj. n=147, AfAm n=210
  - Control (drawn from general population, irrespective of paternal alcohol status), Maj n=190, AfAm n=319
METHODS – Data Analysis

- Dependent Variable: Alcohol Abuse and Dependence
- Independent Variable: GAD
- Covariates: Race, age (<18y), Sex, Income (<$45,000), Regular Marijuana Use, Marijuana Abuse and Dependence, Regular Smoker, Nicotine Dependence, Social Phobia, Panic Attacks (>3), Panic Disorder
- Potential Effect Modifier: Major Depressive Disorder (MDD)
METHODS - Data Analysis

- Bivariable relationships were assessed using the chi-square statistic
- The Breslow-Day test for homogeneity was used to test for effect modification by MDD
- Logistic Regression was employed to construct a multivariable model
- All covariates were assessed as confounders: A variable was considered a confounder if its addition to the model resulted in a >10% change in the OR for GAD
RESULTS: Table 1. Characteristics of MOFAM sample by GAD diagnosis.

<table>
<thead>
<tr>
<th></th>
<th>GAD Diagnosis (n=78)</th>
<th>No GAD Diagnosis (n=1199)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>61.54</td>
<td>52.21</td>
<td>0.110</td>
</tr>
<tr>
<td>Family type</td>
<td></td>
<td></td>
<td>0.064</td>
</tr>
<tr>
<td>Repeat drunk driving</td>
<td>32.05</td>
<td>32.53</td>
<td></td>
</tr>
<tr>
<td>High risk</td>
<td>38.46</td>
<td>27.19</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>29.49</td>
<td>40.28</td>
<td></td>
</tr>
<tr>
<td>Age &lt;18y</td>
<td>42.31</td>
<td>57.38</td>
<td>0.009</td>
</tr>
<tr>
<td>Female</td>
<td>58.97</td>
<td>50.04</td>
<td>0.126</td>
</tr>
<tr>
<td>Income (&lt;$45,000)</td>
<td>60.0</td>
<td>55.34</td>
<td>0.431</td>
</tr>
<tr>
<td>Condition</td>
<td>P-value</td>
<td>Odds Ratio</td>
<td>95% CI</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>---------</td>
<td>------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Regular Marijuana User</td>
<td>0.297</td>
<td>16.01</td>
<td>20.51</td>
</tr>
<tr>
<td>Marijuana Abuse and Dependence</td>
<td>&lt;0.001</td>
<td>5.50</td>
<td>21.79</td>
</tr>
<tr>
<td>Regular Smoking</td>
<td>0.005</td>
<td>18.85</td>
<td>32.05</td>
</tr>
<tr>
<td>Nicotine Dependence</td>
<td>0.001</td>
<td>13.76</td>
<td>28.21</td>
</tr>
<tr>
<td>Major Depressive Disorder</td>
<td>&lt;0.001</td>
<td>8.59</td>
<td>37.18</td>
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<tr>
<td>Social Phobia</td>
<td>&lt;0.001</td>
<td>20.85</td>
<td>57.69</td>
</tr>
<tr>
<td>Panic Attack*</td>
<td>&lt;0.001</td>
<td>6.92</td>
<td>38.46</td>
</tr>
<tr>
<td>Panic Disorder</td>
<td>&lt;0.001</td>
<td>1.08</td>
<td>10.26</td>
</tr>
</tbody>
</table>

*At least 4 panic attack episodes that peak within 10 minutes
RESULTS – Interaction between GAD and Major Depression

- Using the Breslow-Day test, we identified a significant interaction between GAD and major depression ($p=.028$)

- Therefore, the interaction was modeled as a set of dummy variables:
  - GAD with MDD (GAD+MDD+) $n=29$
  - GAD without MDD (GAD+MDD-) $n=49$
  - MDD without GAD (GAD-MDD+) $n=103$
## RESULTS: Table 2. Logistic Regression Model predicting AUD by GAD and MDD status

<table>
<thead>
<tr>
<th></th>
<th>OR (95% CI)</th>
<th>Adjusted*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crude</td>
<td>Adjusted*</td>
</tr>
<tr>
<td>GAD+MDD+</td>
<td>2.075 (0.904-4.762)</td>
<td>0.547 (0.194-1.543)</td>
</tr>
<tr>
<td>GAD+MDD-</td>
<td>2.403 (1.281-4.508)</td>
<td>1.774 (0.816-3.854)</td>
</tr>
<tr>
<td>GAD-MDD+</td>
<td>2.927 (1.891-4.530)</td>
<td>1.966 (1.151-3.357)</td>
</tr>
</tbody>
</table>

*Adjusted for race, family status, age, sex, marijuana abuse and dependence, nicotine dependence and social phobia*
RESULTS: SUMMARY

- In unadjusted analyses, GAD without depression and depression without GAD are significantly positively associated with AUD.

- After controlling for relevant confounders (race, family status, age, sex, marijuana abuse and dependence, nicotine dependence, and social phobia) the strength of the association is attenuated for GAD+MDD- and GAD-MDD+, and that for GAD+MDD+ changes direction, although only the OR for GAD-MDD+ is statistically significant.
CONCLUSIONS

- The relationship between GAD and AUD may be moderated by MDD such that having GAD+MDD+ is negatively associated with AUD and having GAD+MDD- is positively associated with AUD.

- Due to a relatively small number of individuals with GAD in our sample, we lacked statistical power to detect significant effects of this magnitude.

- Attempts should be made to replicate these results in larger samples.
