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Smoking in offspring of alcoholic twins

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Smoking in Offspring of Alcoholic Twins

Jeffrey F. Scherrer (1,2); Hong Xian (2); Andrew C. Heath (1,2); Theodore Jacob (1); William R. True (1,3), Kathleen K. Bucholz (1,2)
BACKGROUND

• Genes contribute to the transmission of nicotine and alcohol dependence in families
• Genetic influence on nicotine and alcohol dependence overlap
• Nicotine dependence is more common in subjects with history of alcohol dependence
• Parents influence smoking in young adults
OBJECTIVE

• Characterize smoking in offspring of twins with history of alcohol dependence
• Characterize smoking in twin generation
• Determine risk for young adult smoking behaviors as a function of father-child closeness in a design that accounts for the genetic risk imparted from paternal nicotine dependence and alcohol dependence
METHODS

Sample derived from Children of Alcoholics study (1999-present)

- **Fathers**
  - 1464 twin fathers sampled from the Vietnam Era Twin Registry
  - All had at least 1 child 12-26 yrs old in 1999
  - Twin pairs either concordant or discordant for alcohol dependence. Controls were non-alcoholic twin pairs
  - 1,213 (83%) fathers responded to diagnostic telephone interview

- **Mothers**
  - 1,064 biological and/or rearing mothers were eligible
  - 862 (81%) eligible mothers responded to diagnostic telephone interview

- **Offspring**
  - 1,487 offspring with consent from both parents were eligible
  - 1,270 (85%) eligible offspring responded to diagnostic telephone interview
Measurements

• Twin father report
  – lifetime nicotine dependence
  – lifetime alcohol dependence

• Offspring report
  – father-child closeness
  – Age
  – Gender
Offspring smoking measures

- Ever try cigarettes
- Age onset try smoking
- Regular smoking (Smoke > 100 cigs)
- Quit/reduce smoking
- Age quit smoking
- Failed cessation
- Years smoked
- Mean cigarettes in typical day
- Nicotine withdrawal
- DSM-IV criteria nicotine dependence
Analytic Approach

• Independent variables: paternal nicotine dependence, paternal alcohol abuse/dependence included to account for sampling design and to control for genes common to ND, offspring age and parent-child closeness

• Dependent variables: smoking initiation, regular smoking, 1 pls nicotine dependence symptom, DSM-IV nicotine dependence, quit attempt, successful cessation

• Logistic Regression

• STATA used to account for clustered data when computing 95% confidence intervals
Twin 4 group risk design

• Grp 1: MZ and DZ twins with ND, high genetic/ high environmental risk
• Grp 2: MZ with no-ND, co-twin with ND, high genetic/ low environment
• Grp 3: DZ with no-ND, co-twin with ND, medium genetic/ low environment
• Grp 4: MZ and DZ twins with no ND, low genetic/ low environment
RESULTS
<table>
<thead>
<tr>
<th>TABLE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>• THIS SLIDE FROM WORDPERFECT</td>
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</tbody>
</table>
TABLE 2

• This slide from wordperfect
<table>
<thead>
<tr>
<th>Smoking status ('92)</th>
<th>Grp 1 MZ &amp; DZ ND twins</th>
<th>Grp 2 MZ no ND index with ND co-twin</th>
<th>Grp 3 DZ no ND index with ND co-twin</th>
<th>Grp 4 MZ and DZ no ND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever reg. smoker</td>
<td>98.0%</td>
<td>53.8%</td>
<td>57.1%</td>
<td>26.5%</td>
</tr>
<tr>
<td>Current smoker</td>
<td>56.4%</td>
<td>33.9%</td>
<td>36.5%</td>
<td>25.0%</td>
</tr>
</tbody>
</table>

Reg. smoker - smoked 30pls days in a row in lifetime
Current smoker – reg. smoker who smoked in year prior to interview
Table 4. Genetic and environmental influences on offspring smoking behavior adjusted for COAT sampling design (alcohol dependence (AD))

<table>
<thead>
<tr>
<th>Risk groups*</th>
<th>ever try cig.</th>
<th>reg. smoker</th>
<th>ND 1sx</th>
<th>DSM-IV ND</th>
<th>quit attempt</th>
<th>quit</th>
</tr>
</thead>
<tbody>
<tr>
<td>MZ &amp; DZ ND</td>
<td>1.4 (1.1-1.8)</td>
<td>2.5 (1.8-3.4)</td>
<td>2.4 (1.7-3.4)</td>
<td>2.5 (1.6-4.2)</td>
<td>0.8 (0.5-1.5)</td>
<td>0.5 (0.2-0.8)</td>
</tr>
<tr>
<td>MZ no ND/ND co-twin</td>
<td>1.1 (0.7-1.8)</td>
<td>2.0 (1.2-3.3)</td>
<td>2.0 (1.2-3.3)</td>
<td>1.6 (0.7-3.4)</td>
<td>0.4 (0.2-0.9)</td>
<td>0.6 (0.2-1.5)</td>
</tr>
<tr>
<td>DZ no ND/ND co-twin</td>
<td>0.9 (0.6-1.3)</td>
<td>1.6 (0.9-2.7)</td>
<td>1.4 (0.9-2.7)</td>
<td>1.4 (0.7-2.8)</td>
<td>0.7 (0.3-1.5)</td>
<td>0.7 (0.3-1.7)</td>
</tr>
<tr>
<td>MZ &amp; DZ AD</td>
<td>1.3 (0.9-1.8)</td>
<td>0.9 (0.6-1.2)</td>
<td>1.0 (0.7-1.4)</td>
<td>0.9 (0.6-1.5)</td>
<td>1.3 (0.8-2.3)</td>
<td>1.0 (0.5-1.8)</td>
</tr>
<tr>
<td>MZ no AD/AD co-twin</td>
<td>1.2 (0.8-1.8)</td>
<td>0.9 (0.6-1.4)</td>
<td>1.0 (0.6-1.5)</td>
<td>0.9 (0.5-1.7)</td>
<td>1.2 (0.6-2.5)</td>
<td>1.4 (0.7-2.9)</td>
</tr>
<tr>
<td>DZ no AD/AD co-twin</td>
<td>1.0 (0.7-1.5)</td>
<td>0.7 (0.5-1.1)</td>
<td>1.0 (0.6-1.5)</td>
<td>0.9 (0.5-1.7)</td>
<td>1.4 (0.7-2.9)</td>
<td>0.8 (0.3-2.0)</td>
</tr>
<tr>
<td>Father-child close</td>
<td>0.5 (0.3-0.8)</td>
<td>0.4 (0.3-0.6)</td>
<td>0.4 (0.3-0.6)</td>
<td>0.4 (0.3-0.6)</td>
<td>0.3 (0.2-0.6)</td>
<td>1.0 (0.5-1.8)</td>
</tr>
<tr>
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</tr>
<tr>
<td>Offspring age:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-22 y.o.a.</td>
<td>4.8 (3.6-6.4)</td>
<td>4.2 (3.1-5.8)</td>
<td>4.6 (3.2-6.4)</td>
<td>3.0 (1.8-5.0)</td>
<td>1.9 (1.1-3.3)</td>
<td>1.6 (0.7-3.6)</td>
</tr>
<tr>
<td>23-26 y.o.a.</td>
<td>4.0 (3.0-5.4)</td>
<td>3.8 (2.7-5.3)</td>
<td>3.7 (2.6-5.3)</td>
<td>3.1 (1.9-5.3)</td>
<td>2.5 (1.4-4.6)</td>
<td>3.0 (1.4-6.8)</td>
</tr>
</tbody>
</table>
CONCLUSIONS

- Smoking histories, quit attempts and ND are more common in offspring 18 years or older.
- Smoking is present in non-ND fathers but seems to not increase risk in offspring.
- Offspring at high genetic and high environmental risk were more likely to try cigarettes, become regular smoking, have 1 ND sx, have DSM-IV ND and were less likely to successfully quit.
- Father – child closeness was protective for offspring smoking behaviors.