The Interaction between Nicotine and Negative Symptoms in Schizophrenia and Bipolar Disorder

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Introduction

• Individuals with psychiatric conditions, such as schizophrenia (SZ) and bipolar disorders (BD), have a higher rate of smoking and have lower quit rates compared to the general population.
• As a dopamine agonist, nicotine may help alleviate negative symptoms by increasing abnormally low levels of dopamine in the prefrontal cortex and mesolimbic system consistent with the dopamine deficit hypothesis.

Hypothesis

Specifically, we expect SZ and BDP to have similar behavioral patterns on nicotine. Based on the mechanism of nicotine, the current study expected higher rates of smoking in SZ and BP with psychotic features compared to the general population.

Purpose of the Study

The purpose of the study is to further explore the interactions of nicotine use on symptomatic features. In contrast, we expect BDN to have a lower rate of smoking and have lower quit rates compared to the general population.

Method

Participants:

• 48 individuals diagnosed with BDN, 47 individuals diagnosed with BDP, and 50 individuals diagnosed with SZ.

• Demographic information for each group can be found in Table 1.

Table 1. Demographic Information by Group

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Bipolar Disorder</th>
<th>Schizophrenia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>38.3(12.8)</td>
<td>38.0(13.3)</td>
<td>36.0(12.6)</td>
</tr>
<tr>
<td>Gender (% male)</td>
<td>37.9</td>
<td>29.2</td>
<td>29.8</td>
</tr>
<tr>
<td>Ethnicity (%)</td>
<td>54.0</td>
<td>0.06</td>
<td>0.57</td>
</tr>
</tbody>
</table>

|                      | 38.3(12.8) | 38.0(13.3) | 36.0(12.6) |
|                      | 38.3(12.8) | 38.0(13.3) | 36.0(12.6) |

There were no significant differences between groups on age, gender, or ethnicity.

Data Analysis:

• A multivariate ANOVA was used to evaluate differences between groups, smokers, and non-smokers. The current study examined current usage of nicotine.

Results

• Based on the criteria of Kaiser-Guttman, PCA indicated that the SANS subscales are composed of five factors:
  - Factor 1 measures Affective Flattening
  - Factor 2 measures Anhedonia-Asociality
  - Factor 3 measures Alogia
  - Factor 4 measures Avolition-Apathy
  - Factor 5 measures Attention

Discussion

• Results suggested that the only difference in negative symptoms among the groups was for attention.

• The sample was divided into more homogenous subsets based on diagnostic category and nicotine usage, differential patterns of relationships of nicotine on attention were found. Specifically:
  - In schizophrenia, non-smoking and smoking were associated with attention.
  - In bipolar disorder, non-smoking and smoking were not associated with attention.

• Findings also indicate supporting evidence for the continuum conceptualization of psychosis.

• Similar to schizophrenia, we found bipolar disorder with psychosis to have lower emotional expressivity compared to bipolar disorder without psychosis.

• Findings also indicate that the SANS preserves its ability to measure negative symptoms in a mixed clinical sample.

• Results must be considered in the context of their limitations. First, cause and effect cannot be inferred because no participants were randomly assigned.

• Furthermore, hypotheses regarding long-term vs. short term usage of nicotine could not be examined because past usage was not recorded.

• Additionally, these results were obtained in a population of symptomatically stable out-patients, and therefore do not necessarily extend to individuals with more severe symptoms.

• Future studies should include questionnaire assessing pattern of smoking, such as the Fagerström Test for Nicotine Dependence, when evaluating nicotine usage and may attempt to examine any relationship between nicotine and antipsychotic medications and their interaction on the negative symptoms of schizophrenia and bipolar disorder.