Prospective Evaluation of Adverse Driving Outcomes in ADHD and Depression

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Introduction

• Motor vehicle driving is a complex activity of daily living that involves negotiating traffic, passenger, and technology demands simultaneously.
• Adults with ADHD are between 1.5 to four times more likely to endorse involvement in a motor vehicle accident (Chang et al., 2014; Barkley et al., 1993).
• Compared to drivers with depression, ADHD was uniquely associated with increased risk for multiple collisions (Aduen et al., 2015).
• Shortcoming of most studies in the driving and ADHD literature is reliance on retrospective recall of self-report, self-selected samples, and lack of psychiatric comparison group (Cox et al., 2011; Chang et al., 2014).

Present Study

• As part of SHRP-2, participants consented to have Data Acquisition Systems (DAS) installed in their vehicles to capture routine driving and Safety Critical Events (SCE) continuously for 1-2 years.
• **Aim #1**: To examine prospective, objective adverse driving outcomes from on-road assessment of driving in a large, nationally representative sample of U.S. drivers with (a) ADHD, (b) Depression, and (c) no known psychopathology participating in SHRP-2 NDS.

Method: Participants

<table>
<thead>
<tr>
<th>Diagnostic Status</th>
<th>ADHD</th>
<th>Depression</th>
<th>HC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>50.9%</td>
<td>69.3%</td>
<td>52.4%</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-25</td>
<td>68.4%</td>
<td>42.2%</td>
<td>36.2%</td>
</tr>
<tr>
<td>26-65</td>
<td>22.5%</td>
<td>40.2%</td>
<td>34.5%</td>
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<tr>
<td>66+</td>
<td>8.7%</td>
<td>17.5%</td>
<td>29.0%</td>
</tr>
</tbody>
</table>

N = 2,354

Primary Outcome Variables

Safety Critical Events (SCE) 
(Prospective over 1-2 Years)

- Crash/Near-Crash Frequency
  - 0, 1, 2 or More
- Crash Severity (Yes/No)
  - Level 1-4 (Severe to Low Risk/Tire Strike)
- Crash/Near-Crash Fault* (Yes/No)

Analyses

• Multinomial logistic regression predicted relative risk for prospective, objective adverse driving outcomes for ADHD and Depression relative to Healthy Control and relative risk for ADHD relative to Depression.

Results

- Relative Risk for Single and Multiple Crashes and Near-Crashes

Discussion

• Both drivers with ADHD and Depression were at increased risk for experiencing multiple crashes compared to Healthy Control drivers.
• Drivers with Depression were more likely to experience a single near-crash compared to Healthy Control drivers, while both ADHD and Depression predicted increased risk to cause multiple near-crashes.
• Among drivers involved in at least one crash, both drivers with ADHD and Depression were more likely to experience minor crashes.
• Both drivers with ADHD and Depression were at increased risk for low risk/tire strike crashes.
• Findings suggest both disorder-specific and transdiagnostic risk factors, such as attention and other cognitive vulnerabilities, may be involved in adverse driving outcomes.