THE EFFECTS OF 'HANGOVER' ON PSYCHOMOTOR PERFORMANCE TWELVE HOURS AFTER DRINKING

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INTRODUCTION

Hangover is a term commonly used to denote the adverse after effects of consuming alcohol. Here, "hangover" will also be used to indicate alterations in perception, cognition and performance due to the prior consumption of ethanol, as indicated by the tasks which were used to test performance. Hangover may begin when a raised blood alcohol concentration (BAC) begins to decline and increases in intensity as the BAC approaches zero\(^\text{21}\). A number of studies have examined performance after the intoxication phase\(^\text{1,3,4,5,6,7,9,10,11,14,17}\). In most studies, where detrimental effects on performance were seen more than two hours after the cessation of drinking, these occurred in tasks of at least moderate complexity and/or difficulty. It is worthy of note that only one study found any effect of hangover after a dose of less than 1.0 g/kg of alcohol\(^\text{5}\). In general, only studies administering substantial doses of alcohol have been able to demonstrate any post-intoxication effects, even with quite difficult tasks.

Detailed analysis of the results of a study concerned with the effects of alcohol and cannabis upon performance\(^\text{5}\) has shown that one of the measures, simple reaction time, remained increased three hours after consumption of alcohol. The present study was designed to examine this effect at an interval comparable to most other hangover studies. Tests of visuomotor performance and vigilance were included to assess what aspect of performance might be involved, and EEG recordings were made during the vigilance test in an attempt to discover changes in the evoked response potential (see Fox et al., this volume).

METHOD - Subjects

Sixty-four healthy male subjects participated. Volunteers were not included in the study if they: (a) used other recreational drugs regularly (more than once/month) or were currently taking medication or being treated for a medical condition; (b) had a history of liver or kidney problems; (c) had previously
sought help for alcohol problems; (d) had a history of psychiatric illness; (e) had never consumed a dose of alcohol equivalent to 7-8 standard drinks in one session (i.e. in approximately 3 hours), which is equivalent to the highest dose employed in this study; (f) had a history of epilepsy.

**Instruments**

The Lifetime Drinking History\(^{18}\), Last 30 Days of Drinking\(^{8}\), a recent drug and alcohol use inventory and the Alcohol Use Disorders Identification Test\(^{16}\) were used to assess alcohol and drug use patterns. The University of Sydney Sleep Questionnaire and a Sleep Log Diary were used to record sleep patterns. The Rozelle Divided Attention Task\(^{12}\), the Simple Reaction Time Task\(^{5}\) and the Mackworth Clock task\(^{12}\) were used to measure performance.

**Procedure**

Subjects were randomly assigned to four groups; PLACEBO (dose = 0.0 g/kg; \(n = 15\)), LOW (dose = 0.5 g/kg; \(n = 14\)), MEDIUM (dose = 0.75 g/kg; \(n = 17\)) and HIGH (dose = 1.0 g/kg; \(n = 19\)).

<table>
<thead>
<tr>
<th>Time</th>
<th>Baseline (PM)</th>
<th>Acute (PM)</th>
<th>Hangover (AM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00</td>
<td>Begin fasting</td>
<td>Begin fasting</td>
<td>-</td>
</tr>
<tr>
<td>5:30</td>
<td>BAC - begin questionnaire</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7:00</td>
<td>-</td>
<td>BAC - begin drinking</td>
<td>-</td>
</tr>
<tr>
<td>7:30</td>
<td>Fit electrode cap</td>
<td>End drinking - fit cap</td>
<td>Breakfast - fit cap</td>
</tr>
<tr>
<td>7:40</td>
<td>-</td>
<td>BAC</td>
<td>BAC</td>
</tr>
<tr>
<td>7:45</td>
<td>Begin test session</td>
<td>Begin test session</td>
<td>Begin test session</td>
</tr>
<tr>
<td>8:40</td>
<td>End of session</td>
<td>End of session - BAC</td>
<td>End of session</td>
</tr>
</tbody>
</table>

**RESULTS**

Performance on both the simple reaction time (regular - \(F[1,60] = 4.5\) - Figure 1) and the divided attention (\(F[1,60] = 15.7\) - Figure 2) tasks decreased as a function of the dose of alcohol consumed on session 2. The Mackworth clock and simple reaction time (irregular) tasks were also negatively affected, but not significantly. There was no effect of dose on any task in the hangover session.
DISCUSSION

In all tests, the PLACEBO group showed slightly (but not significantly) worse performance than the LOW group. Small apparent improvements in some tests at low doses of alcohol are not unknown\(^1\). In summary, the results of the present study demonstrate that although the doses of alcohol used were sufficient to produce acute decrements in performance on divided attention and simple reaction time tasks, they did not result in decrements in performance 12 hours after drinking.

Figure 2 - Performance on the Divided Attention task adjusted for baseline.

![Figure 2](image)

REFERENCES


9. Ideström, C. M. & Cadenius, B. Time relations of the effects of alcohol compared to placebo: Dose-response curves for psychomotor and perceptual test performances and blood urine levels of alcohol. Psychopharmacologia, 9; 189-200; 1967.


