

Drink and drug driving in Australian young adult users and non-users of illicit stimulants

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Abstract

Introduction: There is limited understanding of how young adults' driving behaviour varies according to long-term substance involvement. It is possible that regular users of amphetamine-type stimulants (i.e. ecstasy (MDMA) and methamphetamine) may have a greater predisposition to engage in drink/drug driving compared to non-users. We compare offence rates, and self-reported drink/drug driving rates, for stimulant users and non-users in Queensland, and examine contributing factors. **Methods:** The Natural History Study of Drug Use is a prospective longitudinal study using population screening to recruit a probabilistic sample of amphetamine-type stimulant users and non-users aged 19-23 years. At the 4 ½ year follow-up, consent was obtained to extract data from participants' Queensland driver records (ATS users: n=217, non-users: n=135). Prediction models were developed of offence rates in stimulant users controlling for factors such as aggression and delinquency. **Results:** Stimulant users were more likely than non-users to have had a drink-driving offence (8.7% vs. 0.8%, $p < 0.001$). Further, about 26% of ATS users and 14% of non-users self-reported driving under the influence of alcohol during the last 12 months. Among stimulant users, drink-driving was independently associated with last month high-volume alcohol consumption (Incident Rate Ratio (IRR): 5.70, 95% CI: 2.24-14.52), depression (IRR: 1.28, 95% CI: 1.07-1.52), low income (IRR: 3.57, 95% CI: 1.12-11.38), and male gender (IRR: 5.40, 95% CI: 2.05-14.21). **Conclusions:** Amphetamine-type stimulant use is associated with increased long-term risk of drink-driving, due to a number of behavioural and social factors. Inter-sectoral approaches which target long-term behaviours may reduce offending rates.

Introduction

Young adults are a high-risk segment of the population for dangerous driving, but it has been observed that the level of risk may vary considerably in relation to specific factors (Bingham, Shope, & Zhu, 2008; Scott-Parker, Watson, King, & Hyde, 2013). One major area of concern with regard to young adult drivers is the high rate of offences for driving under the influence of alcohol or other substances. However, despite the link between substance use and crashes, there is limited research examining factors which may influence young adults' decisions to drive while intoxicated. The available research suggests there could be an association between stimulant intoxication and driving under the influence of alcohol (Kinner, George, Johnston, Dunn, & Degenhardt, 2012; Matthews et al., 2009). One possibility, which remains untested, is that stimulant users may have a greater predisposition to engage in 'drink-driving' or 'drug-driving' compared to other young adults.

The present study compares offence rates for drink- and drug-driving, and self-reported rates of these behaviours, in young adult users and non-users of amphetamine-type stimulants (ATS; i.e. ecstasy or methamphetamine). The factors which may contribute to these offence rates are also examined.

Methods

Study design

The Natural History Study of Drug Use is a prospective longitudinal study which used population screening to recruit a probabilistic sample of amphetamine-type stimulant users and non-users aged 19-23 years. The sampling methodology is described in detail elsewhere (Smirnov, Kemp, Wells, Legosz, & Najman, 2014).

At the 4 ½ year follow-up, consent was obtained to extract data from participants' driver records held with the Queensland Department of Transport and Main Roads. In total, 352 participants consented, comprising 217 ATS group participants (61.6% of the total ATS group sample; 79.2% of the ATS group participants who completed an interview for the 5th wave) and 135 comparison group participants (66.2% of the total comparison group sample; 79.9% of the comparison group participants who completed an interview for the 5th wave). For the present study we used retrospective data extracts for the 5 years preceding the commencement of the 4 ½ year follow-up in September 2013.

Data were collected at 5 time intervals. Participants were interviewed face-to-face at baseline, 12 months and 54 months (i.e. 4 ½ years), and surveyed via the Internet at 6 and 30 months. There was little variation in drug use disclosure across data collection modes.

Measures

The frequency and quantity of recent (last month) alcohol and other drug use were measured at each data collection interval. Alcohol dependence, according to DSM-IV criteria, was assessed using the World Mental Health Survey Initiative version of the World Health Organization's Composite International Diagnostic Interview (WMH-CIDI; Haro et al., 2006). The WMH-CIDI was also used to assess lifetime occurrence of conduct disorder. Anxiety and depression were evaluated using the Hospital Anxiety Depression Scale (Bjelland, Dahl, Haug, & Neckelmann, 2002). We used the Physical Aggression Scale of the Buss-Perry Aggression Questionnaire to measure participants' aggressive traits (i.e. predisposition toward physical aggression; Buss & Perry, 1992). Functional impairment attributable to alcohol use was determined by a cut-off of 9 (90th percentile) on the Sheehan Disability Scale (Leon, Olfson, Portera, Farber, & Sheehan, 1997), and functional impairment attributed to illicit drug use was determined using a cut-off of 8 (90th percentile) on this scale.

Data analysis

Driving behaviour and background characteristics were compared for stimulant users and non-users using Pearson's chi-square. A prediction model of drink driving in the stimulant-using group was developed using Poisson regression for binomial data. The outcome was the presence or otherwise of any drink-driving offences during the 4 ½ years of the study. Predictors were related to substance use, psychological health and impairment. We controlled for sex, age and income. Adjustment was made for all variables in the full model.

Results

Stimulant users were more likely than non-users to have had a drink-driving offence (8.7% vs. 0.8%, $p < 0.001$). Further, about 26% of ATS users and 14% of non-users self-reported driving under the influence of alcohol during the last 12 months ($\chi^2=6.9$, $p < 0.01$). No drug driving offences were recorded for participants in either group. However, 23% of ATS users

compared to 3% of non-users self-reported driving under the influence of illicit drugs in the last 12 months ($\chi^2=24.3, p < 0.001$).

Among stimulant users, having one or more drink-driving offences was independently associated with last month high-volume alcohol consumption (Incident Rate Ratio (IRR): 5.70, 95% CI: 2.24-14.52), depression (IRR: 1.28, 95% CI: 1.07-1.52), low income (IRR: 3.57, 95% CI: 1.12-11.38), and male gender (IRR: 5.40, 95% CI: 2.05-14.21). There was a marginal non-significant ($p < 0.10$) association between regular ecstasy use for the 4 ½ year duration of the study and having a drink-driving offence (IRR: 2.10, 95% CI: 0.92-4.81). Higher levels of anxiety were associated with a reduced likelihood of drink-driving (IRR: 0.82, 95% CI: 0.71-0.94).

Discussion

Our findings indicate that amphetamine-type stimulant use in young adults is associated with increased long-term risk of drink-driving offences. This is the first population-based study to compare rates of substance-impaired driving in young adult stimulant users and non-users. Previous research has indicated that amphetamines are the most common illicit substance detected among substance-impaired drivers on Australian roads (Chu et al., 2012; Davey, Armstrong, & Martin, 2014). However, the present study indicates that involvement in stimulant use is also linked with driving under the influence of alcohol. Moreover, the rates of self-reported drink-driving in this study suggest that offence rates represent only a fraction of problem driving behaviour in this group.

It appears that stimulant intoxication itself plays only a minor role in the relationship between stimulant use and drink-driving. The factors strongly associated with drink driving in this group included high-level recent alcohol consumption and male gender. Australian research, predominantly involving convenience samples of stimulant users, indicates that stimulant users tend to consume alcohol at risky levels (Kinner et al., 2012; Matthews et al., 2009). It may be this tendency which, above all else, results in the greatest harm. Importantly, the association between recent alcohol consumption and drink-driving was independent of alcohol dependence, psychological problems, and substance-related functional impairment.

We did, however, find a robust association between the severity of depressive symptoms and drink-driving in stimulant users. The occurrence of depressive disorders in adolescence and early adulthood has been associated with the subsequent use of stimulants, especially ecstasy, perhaps as a form of self-medication (Huizink, Ferdinand, van der Ende, & Verhulst, 2006; Smirnov et al., 2013). Depression has also been previously linked with an increased likelihood of drink-driving (Karjalainen, Lintonen, Joukamaa, & Lillsunde, 2013; Lapham, Baca, McMillan, & Lapidus, 2006). It is possible that the association observed in the present study reflects a level of susceptibility in depressed young adults for both stimulant use and drink-driving behaviour.

Young adults who use amphetamine-type stimulants are an important target group for driving interventions, especially with consideration of the relative popularity of illicit stimulant use in this age group. The risk profile of this group may provide a useful framework for the design of interventions.

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