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Drug and alcohol-impaired driving among electronic music dance event attendees

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Abstract

Background—Drug-impaired driving has received increased attention resulting from development of rapid drug-screening procedures used by police and state laws establishing per se limits for drug levels in drivers. Venues that host electronic music dance events (EMDEs) provide a unique opportunity to assess drug-impaired driving among a high proportion of young adult drug users. EMDEs are late-night dance parties marked by a substantial number of young adult attendees and elevated drug involvement. No studies to date have examined drug-impaired driving in a natural environment with active drug and alcohol users.

Methods—Six EMDEs were sampled in San Diego, California, and Baltimore, Maryland. A random sample of approximately 40 attendees per event were administered surveys about alcohol and other drug (AOD) use and driving status, given breath tests for alcohol, and asked to provide oral fluid samples to test for illicit drug use upon entering and exiting the events.

Results—Driving status reduced the level of alcohol use (including abstaining) but the impact on drug-taking was not significant. However, 62% of individuals who reported their intention to drive away from the events were positive for drugs or alcohol upon leaving. This suggests that these events and settings are appropriate ones for developing interventions for reducing risks for young adults.

Keywords

Drugs; Driving; Emerging adults

1. Introduction

Our investigation sought to clarify if illicit drug- and alcohol-impaired driving is a risk associated with electronic music dance event (EMDE) attendance. EMDEs are akin to events historically referred to as “raves,” which are all-night dance parties characterized by many young attendees, elevated levels of drug-taking, and dancing to electronic music played by disc jockeys (Arria et al., 2002; Miller et al., 2005). These events, typically held in clandestine locations such as warehouses, are now held in more mainstream locales, such as established bars and clubs, where the term “rave” is no longer used (Measham et al., 1998; Golub et al., 2001).

US-based studies of EMDE attendees provide evidence of elevated levels of drug involvement among EMDE attendees (Miller et al., 2005; Voas et al., 2006; Yacoubian et al., 2003). Studies indicate that rates of ecstasy use among EMDE attendees are decreasing across settings, from a high of approximately 20–30% before 2002 (Lenton et al., 1997; Yacoubian et al., 2003; Arria et al., 2002) to the recently reported rate of less than 10% (e.g. Miller et al., 2005). National rates of ecstasy use also are declining, possibly reflecting an actual decrease occurring in the club scene. Rates of recent other illicit drug use besides ecstasy (including marijuana, hallucinogens, cocaine and amphetamines) are substantially higher among EMDE attendees, approximately 30% reporting use in the past 48 hours (Miller et al., 2005), compared to other age-matched populations from household surveys, which are generally less than 3% in the past year (SAMHSA, 2003).

Driving under the influence of drugs is illegal in all states. The availability of new technologies for rapid screening of drugs in urine (Hersch et al., 2000) and saliva (Caplan and Goldberger, 2001) has stimulated states to set per se limits for drug levels, making the arrest of drugged drivers more likely (Walsh et al., 2002). A national household survey of adults found that 5.3% of drivers report operating a vehicle within 2 hours of drug use (Townsend et al., 1998). Based on estimates from the 2003 National Survey on Drug Use and Health, an estimated 10.9 million people reported driving under the influence of an illicit drug during the past year. This estimate represents nearly 5% of the population aged 15 or older. Among the largest proportion of EMDE attendees (young adults aged 18–25), an estimated 14.1% report drug-impaired driving annually (SAMHSA, 2003). This rate is almost three times that of the general driving population.

The extent that drug use contributes to crash involvement, however, is controversial (Jones et al., 2003). NHTSA estimates that up to 22% of drivers involved in crashes this decade were under the influence of drugs, and many were concomitant users of alcohol (NHTSA, 2004). Drug use has been identified in 17.8% of drivers involved in fatal crashes (Terhune et al., 1992). The National Highway Traffic Safety Administration (NHTSA) reports that 16,000 people are killed annually due to drunk-and-drugged driving (NHTSA, 2004). However, there is variation in the reported influence on driving impairment across the broad range of illicit drugs as well as medical and extra-medical use of prescription drugs (e.g. Kelly et al., 2004; Movig et al., 2004; Ogden and Moskowitz, 2004). Because adequate case control studies are not available, the relative risk presented by the large variety of recreational drugs is unknown; nevertheless, the combined use of alcohol and drugs still raises the risk associated with alcohol use alone (Terhune et al., 1992).

Drug- and alcohol-impaired driving, primarily among the young adult EMDE population, has been understudied. Young adult drivers are at the greatest relative risk among all age groups for involvement in fatal and serious traffic crashes (Jones and Lacey, 2002). Further, 18- to 20-year-olds have the highest rates of alcohol-related traffic crashes (Zador et al., 2000). Because young emerging adults who are drug and alcohol involved are attracted to EMDEs, our investigation sought to clarify if drug-and alcohol-impaired driving is a risk associated with EMDE attendance.

2. Methods

From April through September 2003, we conducted pilot surveys at six EMDEs using the portal survey technique (Voas et al., 2006). Four surveys were conducted on the West Coast in San Diego, California, and two on the East Coast in Baltimore, Maryland. Breath tests for alcohol levels and oral fluid samples for biochemical drug analysis were collected at both entrance and exit to clarify the types of illicit drugs used and the level of use. Self-report data also were gathered and a positive response on either biological or self-report measures

signaled drug and alcohol use. The response rates to the original approach for participation as the subjects entered the venue ranged from 82 to 90%. Groups of attendees were approached to participate rather than single individuals to ensure that refusals were not based upon wanting to keep the group intact. The average group size among those that agreed to participate was 2.3. From the 240 entry participants, we completed 219 exit assessments. The loss of 21 individuals from entrance to exit resulted because we were initially understaffed to adequately handle the mass exodus of attendees from the venue upon closing (approximately 2 a.m. for most venues). Respondents were “tagged” at entry with a non-removable hospital-type ID bracelet containing a unique identification number. The bracelet was cut-off the respondent upon completion of exit assessment. The unique identification number was used to link entry and exit data. A detailed description of the study methodology is provided in Voas et al. (2006).

3. Results

3.1. Sample characteristics

Among the 240 total attendees, 32% were aged 18–20; 39%, aged 21–25; and 30%, aged 26 and older; 60% were male. Racial/ethnic characteristics were 60% White, 26% African American, 3% Native American, 5% Asian, 3% Hawaiians/Pacific Islanders, and 16% Hispanic. Finally, an estimated 45% were students, 85% were employed, and 9% were neither employed nor students. Approximately 43% ($n = 102/240$) of the sample drove to the event and 63% of the drivers were male. Of the 216 exit respondents with driving information, 37% ($n = 79$) reported that they intended to drive upon exiting the event, of which 62% were males.

3.2. Alcohol and drug use

Fig. 1 displays the measured alcohol and drug use of drivers leaving the EMDE. Of the drivers who completed the exit interview, 38.2% had zero BACs and did not test positive for drugs. Among impaired drivers (i.e. those drivers who consumed any drugs or alcohol), 31.6% had only consumed alcohol, whereas (not including marijuana) approximately 12% of the drivers consumed drugs and alcohol, 4% consumed marijuana alone, and 4% consumed marijuana and alcohol only. Among all drinking drivers, 13% ($n = 10$) had a BAC higher than 0.08 and 8% ($n=6$) had a BAC higher than 0.05 but less than 0.08; another 18% ($n = 14$) had a BAC less than 0.05. These estimates were significantly lower for non-drivers with BACs of 0.05–0.08 ($p = 0.047$) and BACs higher than 0.08 ($p = 0.008$).

3.3. AOD use and driving

A multivariable logistic regression model was used to estimate the relationship between alcohol consumption and drug use with the intention to drive after EMDE attendance. Table 1 presents the results of these analyses. Alcohol consumption, based on either self-report of alcohol use while at the event or a positive BAC upon exit, was significantly related to driving status. Attendees who consumed alcohol were half as likely as non-drinkers to report intentions to drive following the event (odds ratio [OR] = 0.468; $p = 0.009$). As BAC levels increased, the likelihood of driving after the event decreased. Attendees with BACs between 0.05 and 0.08 were significantly less likely than non-drinkers to be drivers (OR = 0.343; $p = 0.047$). Attendees with BACs higher than 0.08 were even less likely to drive following the event (OR = 0.297; $p = 0.008$). BACs of 0.05 or lower were not associated with driving plans. Attendees who used drugs were less likely than non-drug users to report intentions to drive, but this difference was not significant ($p = 0.96$).

4. Discussion

Drug- and alcohol-impaired driving is a significant problem among EMDE attendees. Approximately two of three drivers (62%) who had used drugs or alcohol planned to operate a motor vehicle after leaving the event. Interestingly, heavy alcohol users were less likely to drive away from the event. Additionally, drivers consumed less alcohol than non-drivers. Intent to drive, therefore, lowered the level of alcohol consumed and also influenced the choice to abstain from drinking. In contrast, there was no significant difference in drug use by driving status.

This study had some limitations. It is not clear that the events and attendees surveyed reflect the larger universe of EMDEs and their attendees. Further, our findings need to be replicated with larger samples selected from a more diverse set of EMDEs. Unlike our measure of alcohol consumption that allowed us to determine the level of use, our measures of drug use did not allow us to examine the level of consumption. Any use of drugs, however, is defined as evidence of driving impairment.

Nonetheless, our results present preliminary evidence that EMDE attendees are more aware and concerned about driving under the influence of alcohol (20% difference between drivers and non-drivers—Table 1) than driving under the influence of drugs (12% difference between drivers and non-drivers—not significant). This difference is not surprising. Given the national attention to drinking and driving and the concentrated efforts to curb this problem throughout the United States, this difference suggests that messages about drug use and driving need to be better publicized. These messages might be particularly directed at young, emerging adults (aged 18–25) who are less experienced drivers. Further, these results suggest the EMDE scene provides an opportunity to study this impaired-driving problem and to model and test possible preventive interventions.

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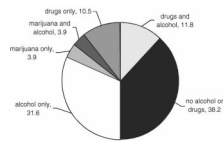


Fig. 1.
AOD impaired driving among drivers at exit ($n = 79$).

Table 1

Alcohol and drug use among drivers and non-drivers and relative odds of driving from an event

| | Driver (N = 79) | Non-driver (n = 137) | Odds ratio^a | p-value |
|--------------------------------|------------------------|-----------------------------|-------------------------------|----------------|
| Non-drinker | 49 (62.0%) | 61 (44.5%) | 1.00 ^b | – |
| Any alcohol consumption | 28 (36.4) | 76 (55.5%) | 0.468 | 0.009 |
| Drinker BAC < 0.05 | 14 (17.7%) | 24 (17.5%) | 0.664 | 0.324 |
| Drinker BAC > 0.05, but <0.08 | 6 (7.6%) | 18 (13.1%) | 0.343 | 0.047 |
| Drinker BAC > 0.08 | 10 (12.7%) | 34 (24.8%) | 0.297 | 0.008 |
| Any drug use on night on event | 23 (30.3%) | 56 (41.8%) | 0.585 | 0.096 |

^a Adjusted for other characteristics in the table.

^b Reference category.