DUID prevalence in Colorado's DUI citations

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A B S T R A C T

Introduction: There are limited studies that measure the prevalence of driving under the influence of drugs (DUID) based upon impairment measures because most prevalence studies are based on drug tests. The aim of this study was to provide the first estimate of DUID prevalence in Colorado using data collected by Colorado law enforcement officers in vehicular homicide (VH) and vehicular assault (VA) cases, and reported in court records. *Methods:* The four research questions of this study were answered by completing independent *t*-tests or Mann–Whitney *U* tests, Pearson chi-square analyses or Fisher's exact tests, and Kruskal–Wallis tests. *Results:* Seventy percent (119 out of 170) of the cases involved alcohol only and 30% (51 out of 170) involved drugs. Of the latter cases, 32 cases involved a combination of alcohol and drugs and 19 cases identified drugs only, with no alcohol. Marijuana was the most commonly cited drug (23 cases); however, it was the sole impairing substance identified in only three cases. *Conclusion:* Polydrug use was very common among DUID cases, which makes it difficult to identify which drug or drugs caused the impairment responsible for the Driving Under the Influence citation. This study revealed tha (a) drugged driving is a frequent cause of DUI citations in cases charged with VH or VA; (b) that polydrug use, rather than marijuana, is the most common cause of drugged driving in Colorado; and (c) that current warrant procedures render blood test results meaningless in cases of marijuana-impairment. *Practical application:* States should collect and analyze DUID data to ensure legislators focus on the right DUID problems to improve biological testing for drugs, adopt more appropriate roadside testing, and enact stronger DUID laws to protect the public.

1. Introduction

Within the last decade, driving under the influence of drugs (DUID) has been identified as a significant public safety concern by leading local and national organizations (Colorado Task Force on Drunk and Impaired Driving, 2014; Governors Highway Safety Association, 2014; Office of National Drug Control Policy, 2011) This concern is supported by abundant evidence of the impairing power of a myriad of illicit drugs, licensed pharmaceuticals used recreationally, as well as medicines taken as prescribed. The National Highway Traffic Safety Administration (NHTSA) published fact sheets on the impairing effects of a range of drugs from cannabis to Zolpidem (Couper & Logan, 2014). The psychomotor impairing effects of opioids have been extensively documented revealing striking tolerance differences between naïve users and those habituated to the drugs (Stout & Farrell, 2002). Logan (2002) summarized studies of methamphetamine and other amphetamines, noting that low therapeutic doses may be safe for driving, but higher doses that are typical in abuse situations are both impairing and unpredictable, especially when used in combination with other drugs.

Cannabis impairment has been studied and reported extensively. A small experimental study in the Netherlands gave participants one of three varying doses of THC (0, 100, and 200 μg/kg) with or without alcohol. The researchers discovered that driving performance was worse with higher levels of THC and in the alcohol and THC combinations. In addition, participants self-reported stronger intoxication ratings in the THC and alcohol combination groups (Ramaekers, Robbe, & O'Hanlon, 2000). A roadside study in Norway of 4963 drivers impaired by alcohol, THC, or a combination of both revealed that alcohol and THC in combination are more impairing than either separately (Bramness, Khiabani, & Morland, 2010). Hartman and Huestis (2013) reported that evaluations of the impairing effects of cannabis are complicated by such factors as delays in sample collection, testing of the drug's inactive metabolite, and polydrug use. Nevertheless, after a careful systematic study of the literature, the authors reported that "recent smoking [of cannabis] and/or blood concentrations of 2-5 ng/ml of Δ^9THC are associated with substantial driving impairment, particularly in occasional smokers."

The evidence that many drugs impair drivers is plentiful and convincing. Yet determining the prevalence and consequences of DUID has proven to be more problematic. Laboratory tests can be used to determine the presence of impairing drugs in drivers. For example, the Fatality Analysis Reporting System (FARS) compiles data on drivers

in fatal crashes, including laboratory tests, primarily from coroners (National Highway Traffic Safety Administration [NHTSA], 2015). NHTSA (2010) reported that in 2009, 33% of fatally injured drivers with known drug test results tested positive for drugs. Brady and Li (2014) reported that the prevalence of non-alcohol drugs in fatal crashes was 28.3% in 2010.

Researchers have used the FARS data set because FARS has documented fatalities from motor-vehicle crashes occurring within the 50 United States, the District of Columbia, and Puerto Rico since 1975. Recent studies using the FARS data have demonstrated a poor or mixed association between various drugs and fatal crashes (Anderson & Rees, 2012; Romano, Torres-Saavedra, & Voas, 2014). However, FARS provides too few data entry fields to capture the scope of polydrug abuse and does not distinguish between impairing drugs and some inactive metabolites, such as marijuana's 11-nor 9 carboxy tetrahydrocannabinol (THC-COOH). It captures drug data on drivers irrespective of their culpability in causing a crash; some are victims of culpable drivers. Reporting in most states is voluntary and variable. NHTSA recognizes some of these limitations of FARS and also pointed out that the mere presence of drugs does not necessarily mean impairment, cautioning users of the FARS data against inferring DUID trends or prevalence from the database (Berning & Smither, 2014a).

Roadside voluntary drug tests have been used to show changes in prevalence over time, but they also fail to distinguish between drug presence and drug impairment. NHTSA reported that 22.5% of weekend nighttime drivers tested positive for drugs in the 2013–2014 National Roadside Survey (Berning, Compton, & Wochinger, 2014b).

This study takes a different approach to measuring the prevalence of DUID, based upon impairment measures, rather than laboratory measures. Data for the study were collected from driving under the influence (DUI) assessments made by Colorado law enforcement officers, and recorded in court records.

Although laboratory tests alone will suffice to support a charge of DUI per se, officers must observe and document signs of impairment to charge a driver with DUI. Colorado has a single DUI offense for driving under the influence of alcohol, drugs, or a combination of alcohol and drugs. If evidence supports a charge of driving under the influence of alcohol, officers in Colorado need make no effort to collect evidence in support of DUID because the statute does not provide for a separate DUID charge.

Colorado typically has 25,000 DUI cases per year (Colorado Department of Transportation, 2013). Since Colorado has no separate charge for DUID, the state does not record how many of those DUI cases are actually DUID cases, even though DUID evidence may remain in police reports and court records. Therefore, the aim of this study is to provide the first estimate of DUID prevalence in Colorado's DUI cases. This estimate may be understated due to the difficulty in collecting evidence for DUID and because the current statute does not require such evidence, if evidence is already collected for alcohol impairment. Specifically, this study endeavored to answer the following questions:

1. Which impairing substances cause DUI in Colorado cases of vehicular homicide/DUI and vehicular assault/DUI?
2. What is the prevalence of DUI and DUID convictions?
3. Are there conviction differences between single vehicle crashes and multiple vehicle crashes?
4. Did a change occur in the amount of time required to collect a blood sample as a result of Missouri vs. McNeely or warrant vs. no warrant?

2. Methods

2.1. Study design

This study was designed to estimate the prevalence of DUID in Colorado's DUI citations by studying drivers shown to be culpable of causing death or serious bodily injuries. This study is unique in that it studies drug impairment, not merely drug presence in drivers. It only reviewed cases where evidence allowed law enforcement officers to charge the suspects with DUI. Also unique, the study followed the cases through to judicial outcome and was able to determine the impact of the Supreme Court's ruling in Missouri vs. McNeely that law enforcement officers may, in some cases, require a warrant to collect blood in suspected DUI cases.

2.2. Data sources

The Colorado State Judicial Branch provided, upon request, a spreadsheet of all charges against, and judicial outcomes of, defendants in Colorado in 2013 who were charged with either vehicular homicide (VH) or vehicular assault (VA), and where the cases had been adjudicated by October 1, 2014.

Court records were studied for each of the DUI cases using the best means available. The redacted case file was read at the respective district courthouse, if permitted and available. Some district courts do not permit viewing the entire file but permit a researcher to purchase specifically identified and redacted documents from the file. Some files were not available on the dates of visits to courthouses, so copies of specifically identified and redacted documents were requested by phone, mail, FAX, or e-mail, depending upon the unique requirements of each district court.

Each case was studied for written evidence of the cause of the DUI charge. Based upon evidence from court files, each case was given one of the following classifications: (a) DUI-A, alcohol was the only impairing substance identified; (b) DUI-D, single or multiple drugs (other than alcohol) identified; and (c) DUI-A + D, both alcohol and one or more drugs identified. Other variables taken from the case files and used in the analyses: drugs found at the scene of the crash; top charge finding (coded 0–1); single or multivehicle crash (coded 0–1); needed warrant for blood draw (coded 0–1); pre/post McNeely Law (coded 0–1); delay in minutes of blood draw; guilty of a DUI (coded 0–1); age; and gender (coded 0–1).

There were 1263 charges made against 229 defendants, 181 who were also charged with DUI. Seven cases were eliminated from further consideration, reducing the pool of all VH/VA defendants to 222 and the DUI subset of cases to 174. One deleted case was of a juvenile offender whose record was sealed during analysis. Six other cases were eliminated because they were not vehicular homicide or assault cases. Instead, a vehicular assault charge due to DUI was added to these cases as part of a plea bargain of a more serious charge such as robbery or aggravated assault. These six cases did not involve vehicles and intoxication. The deletions resulted in 174 VA/VH–DUI cases to evaluate (147 VA-DUI cases and 27 VH-DUI cases). The 48 non-DUI cases were not further studied.

2.3. Statistical analyses

Data were edited and analyzed in SAS®, 9.4. Descriptive analyses were completed to examine the prevalence and frequency of drugs found at the scene of the crash and on the type of DUI cases (A, D, or A + D). To answer the four research questions, independent t-tests or Mann–Whitney U tests (non-parametric independent t-tests), Pearson chi-square analyses or Fisher's exact tests, and Kruskal–Wallis tests (non-parametric one-way ANOVAs) were completed depending on the independent and dependent variables of the specific questions. In addition, age and sex were examined as possible covariates and, if related, were included in the model. Alpha levels of 0.05 and two-sided tests were used to determine significance.

3. Results

Of the 170 cases where the impairing substance was identified as either alcohol or drugs, 119 (70.0%) of the cases involved alcohol only