

DUI Officer Detection of Illicit Drugs in Drivers Using Rapid Immunoassay Devices

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Keywords:

Drugs, Driving, Immunoassay, Illegal Drugs, Point-of-care Testing, Substance Abuse

Abstract

DUI Officers [Tampa Police, Tampa, FL, USA] were trained to use two rapid immunoassay devices to test DUI suspects for recent drug use. In addition to routine breath-alcohol concentration determinations (BAC's), urine specimens were collected by police officers from persons placed under arrest for suspicion of driving-under-the-influence (DUI). Two hundred twenty seven urine specimens were collected and analyzed by one of two "on-site" immunoassay kits being evaluated. The arresting officer conducted all analyses. Aliquots of all specimens testing positive on-site, and 10% of on-site negatives were shipped to a certified lab for re-analysis and confirmation by Gas Chromatography/Mass Spectrometry. Results indicate that 89% of the subject population was legally drunk (BAC's equal to or greater than 0.08) and 30% also tested positive for one or more illegal drugs. Fifty-five percent of those individuals who were able to pass the breathalyzer test with legal levels of alcohol (i.e. BrAc <0.08) were positive for one or more illegal drugs. Marijuana and cocaine were the primary drugs detected. Results support the feasibility of using rapid immunoassay kits for detection of driving under the influence of drugs, and provide insights as to the prevalence of drivers under the influence of illegal drugs.

Introduction

Within the last five years technologically advanced immunoassay drug-testing devices have been developed that can provide qualitative information about the presence of drug/drug metabolites in body fluids within minutes of testing. Most of these devices have been designed primarily for use with urine specimens and marketed for workplace substance abuse testing. Recently new immunoassay products have been introduced into the market designed for use with saliva and sweat as alternative test matrixes. Among the more than 30 brand name devices available on the international market there are significant differences in the

performance of these products (Samyn et al 1999, Buchan, et al 1997). However, evaluations of these devices have generally indicated that products approved by the U.S. Food and Drug Administration [FDA] are capable of providing immediate accurate and reliable results “on-site”. These new immunoassay devices provide a unique opportunity to apply this technology to traffic safety, both in the enforcement of drugs and driving laws, and the conduct of epidemiological research into the prevalence of drugged driving.

Within the last three years there has been an increasing number of international reports documenting the rising prevalence of driving under the influence of illegal drugs (Walsh, et al 1997, Risser et al 1998, Marquet et al 1998). In previous reports we have demonstrated the feasibility of using rapid immunoassay devices with individuals suspected of driving under the influence of drugs (Walsh, et al 1997, Buchan, et al 1997). The present study was designed to evaluate the practicality of having DUI trained officers perform drug assays using rapid immunoassay devices and to determine the prevalence of alcohol and illegal drug use in drivers who were arrested on suspicion of driving under the influence.

Materials and Methods

Police officers from the Tampa, Florida Police Department DUI squads were trained to perform urinalysis tests for drugs of abuse using the TesTcup® [Roche Diagnostic Corp.] and Accusign [Princeton-BioMeditech] immunoassay devices. Training included collection procedures, collection-site preparation to insure integrity of the specimen, universal precaution procedures for handling biological specimens, use of the specific immunoassay devices and chain of custody procedures.

The typical subject had been pulled over for some violation of traffic code, had failed the standard field sobriety test [SFST], was placed under arrest and brought to the Central Breath Testing [CBT] facility at the Hillsborough County Jail for toxicology testing and booking. This is not a random sample of all reckless drivers but is representative of the population of drivers ordinarily stopped by such procedures in Hillsborough County, Florida. Breath and urine specimens were collected by police officers from persons placed under arrest for suspicion of driving-under-the-influence (DUI) who consented to provide the specimens. The Florida Implied Consent Law (Chapter 316.1932, FS) provides the authority for requesting breath and urine specimens from individuals arrested for suspicion of DUI. Breath samples were collected and analyzed in accordance with the administrative rules and laws of Florida by certified police breath-alcohol technicians on an evidentiary breath-testing device. DUI Officers typically waited until the breath testing was completed before requesting a urine sample. Subjects were escorted by the DUI Officer to the bathroom facility where they provided the urine specimen without direct observation. Since all subjects were searched and patted down during the arrest and interview process investigators believed that the possibility for specimen adulteration or substitution was minimal and therefore direct observation was unnecessary. Each urine specimen was then analyzed using one of the two rapid immunoassay [on-site] devices for the following five drug classes at the specified cutoff value: Amphetamines (1000ng/ml), Opiates (300ng/ml), Phencyclidine (25ng/ml), Cocaine (300ng/ml), and Cannabinoids (50ng/ml). Police DUI Officers used the results of the drug test to continue their interrogation of the DUI suspects.

To evaluate the DUI Officer's performance using the immunoassay kits, and for quality control purposes, aliquots of all specimens screening positive and 10% of all negatives were shipped to a forensic urine drug-testing laboratory certified by the US Department of Health

and Human Services for reanalysis by immunoassay and confirmation by Gas Chromatography/Mass Spectrometry.

Results

Our impaired driver subject population was predominately male (85%), mostly white (76.7%), and the majority were between the ages of 21-40. Two hundred twenty seven urine specimens were collected and analyzed by one of the two immunoassay kits being evaluated. All drug analyses were conducted by the arresting officer. Breath alcohol data was also obtained for 97% of subjects providing urine (Seven of the 227 refused to give a breath sample). Historically approximately 30% of Hillsborough County Florida DUI suspects refuse to provide a breath sample for alcohol testing. In most cases those suspects who refused to give breath also refused to give urine.

The age range of our impaired driver population is detailed in table 1. Nearly 67% of the population fell between the ages of 21-40.

AGE RANGE	FREQUENCY	PERCENTAGE
> 20 Years	14	6.2%
21-30	80	35.2%
31-40	72	31.7%
41-50	42	18.5%
51-60	11	4.8%
61-70	6	2.6%
> 70	2	9.9%

Of the 227 urine specimens analyzed by DUI Officers, 32.5% (74) tested positive for illegal drugs. Marijuana (in 58% of positive specimens) and cocaine (in 49%) were the most frequently detected illegal drugs. Opiates were detected in only two specimens and amphetamine in one specimen, however, these drugs were found in combination with either marijuana or cocaine. Twelve specimens contained more than one illegal drug.

Nearly ninety percent (200/227) of our population was legally drunk (BAC's equal to or greater than 0.08) with a mean breath alcohol concentrations of 0.179 [median = 0.16, mode=0.15]. Of those that were legally drunk thirty percent (60/200) also tested positive for one or more illegal drugs.

More than half (52%) of those who passed the breath alcohol test (i.e. BAC's less than 0.08) tested positive for one or more illegal drugs (22% tested positive for two or more illegal drugs).

Police officers used positive drug test results in their interrogation of subjects and were often able to get admissions of drug use when the subject was confronted with the test results.

Police Officers demonstrated good skills in using the on-site kits and ninety-three percent of specimens testing positive on-site were confirmed by the laboratory analysis. All negative control specimens sent to the lab were confirmed as negative.

Summary

The results of this study provides further documentation of the prevalence of illegal drug use by drivers arrested on suspicion of driving under-the-influence. Nearly one-third of all legally drunk drivers were also using illegal drugs, and more than one-half of those who had low or no alcohol in their system. These data replicate earlier findings (Walsh, et al 1997, Marquet et al, 1998, and Risser, et al, 1998) with regard to overall prevalence and the fact that cannabis appears to be the most frequently detected drug. Unfortunately because of the refusal rates to provide breath and urine samples these prevalence rates should be considered as a minimum estimate of the true prevalence.

The results of this study also demonstrate that DUI trained police officers can obtain and test urine specimens for drugs of abuse using immunoassay technology with a high degree of accuracy and reliability. Based on our observations and the DUI officers subjective impressions drug testing could be easily integrated into routine police operations.

In our view, to prevent drug-related traffic accidents, law enforcement officials should be able to detect drivers under-the-influence of drugs as they routinely do now with alcohol detection devices. More than 50% of the subjects who were able to pass the breath alcohol test had in fact been using illegal drugs and typically would not have been charged with DUI. The availability of on-site drug-testing devices that are capable of providing immediate accurate and reliable results provides a unique opportunity to effectively apply this technology in traffic safety and the enforcement of drugs and driving laws. The routine availability of drug testing for DUI and DRE officers could be used as a powerful prevention tool to detect and deter drugged driving behavior.

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