



K1 Drivers Under the Influence of Alcohol and Drugs: An Eight-Year Retrospective Analysis in a Southern Italian Region

Anna Carfora*, University of Campania "L. Vanvitelli," via Luciano Armanni, 5, via Santa Maria di Costantinopoli, 16, Naples 80138, ITALY; Carlo P. Campobasso, MD, PhD, University of Campania, Dept Experimental Medicine, via Santa Maria di Costantinopoli, 16, Napoli 80138, ITALY; Raffaella Petrella, University of Campania "L. Vanvitelli," via Santa Maria di Costantinopoli, 16, via Luciano Armanni, 5, Naples 80138, ITALY; Paola Cassandro, University of Campania "L. Vanvitelli," via Santa Maria di Costantinopoli, 16, via Luciano Armanni, 5, Naples 80138, ITALY; and Renata Borriello, University of Campania "L. Vanvitelli," Via L. Armanni, 5, Naples 80138, ITALY

After attending this presentation, attendees will better understand the Italian trend of alcohol and drug use among motor vehicle drivers involved in Road Traffic Crashes (RTC).

This presentation will impact the forensic science community by providing alcohol and drug results of biological samples collected from 1,797 drivers at the request of police from 2009 to 2016 that were processed at a major forensic toxicological laboratory in southern Italy.

Operating a motor vehicle while Driving Under the Influence Of Alcohol (DUIA) or Drugs (DUID) is considered a crime worldwide because of the risk to traffic safety. Based on the recent report by the National Institute for Statistics (ISTAT) in Italy, there were 173,892 traffic accidents resulting in personal injury in 2015. From 2013 to 2015, an average of four to six deaths and 20 injured drivers per 100,000 people were recorded by ISTAT in the Campania region, the third most-populous region in Italy. This region has a population of 5,869,965 people, with 4,434,136 inhabitants living in the Naples metropolitan area alone, the second most-populated metropolitan area in Italy, after Milan.

A recent Italian Road Traffic Law (IRTL) (L. 41/2016) just updated the crimes related to DUIA and DUID with the penal sanctions having been generally increased. If a driver causes the death of one person and injury to another, he can be punished with 18 years in prison and at least 5 years disqualification from driving. In the Campania region, the Forensic Toxicology Unit (FTU) of the University "Luigi Vanvitelli" of Campania represents the "reference laboratory" of the entire region, performing all of the confirmation toxicological analyses for medicolegal purposes. The toxicology lab is accredited to perform the analytical work on postmortem samples as well as on hospitalized drivers injured because of RTC. According to the sampling protocol established by the current IRTL, when drivers are injured in an RTC, a medical evaluation must be performed first. Immunochemical screening tests on biological samples must follow in order to find evidence of alcohol/drug effects on the driver's performance. Only positive blood and urine samples collected from injured drivers are forwarded to the FTU for confirmation of the toxicological analyses.

To assess the trends in the use of alcohol and drugs among motor vehicle drivers, a retrospective analysis was performed based on drivers involved in RTC and admitted to 16 Emergency Departments (ED) located in the different provinces of the Campania region from 2009 to 2016. An additional goal of the study was to collect data useful to the improvement of toxicological analytical work and preventive policies with regional relevance. Confirmation tests of positive toxicological screening analyses were performed on biological samples (blood/urine) collected from 1,797 hospitalized drivers. The analyses were performed on a total of 780 blood samples: 609 cases were referred for suspected DUIA and 171 cases for suspected DUIA and DUID; 1,017 urine samples were also collected from DUID cases when the blood test was denied by drivers. All blood and urine samples were collected at admission to the ED within two hours of the accident. Blood Alcohol Concentration (BAC) on whole blood was analyzed by Headspace/Gas Chromatograph/Flame Ionization Detector (HS/GC/FID). Qualitative and quantitative analyses for drugs were accomplished by Gas Chromatography/Mass Spectrometry (GC/MS) or Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS).

Results: BAC greater than 0.5g/L (the legal limit in Italy) was observed in 91.5% of drivers suspected for DUIA and in 93% of drivers suspected for DUID. In particular, BAC >1.5g/L were found in 308 suspected cases of DUIA out of 609 (50.5%) and in 66 suspected cases of DUID out of 171 (38.6%). RCT occurred mostly in drivers with BAC >1.5g/L, while in cases of DUID, BACs between 0.5g/L and 1.5g/L were most common. Toxicological analyses for drugs in blood were negative in 51 drivers out of 171 DUIA and DUID cases total (29.8%). Cocaine and Δ^9 -Tetrahydrocannabinol (Δ^9 THC) were the drugs most commonly associated with alcohol, followed by poly-drug abuse, a combination of different drugs among which, again, cocaine and THC were the most represented, followed by methadone and Benzodiazepine (BDZ). Among positive urine analyses, 11-nor-9-Carboxy- Δ^9 -Tetrahydrocannabinol (THCCOOH) was the most frequently identified compound, alone or in association with other drugs, followed by poly-drug>cocaine>BDZ>opiates. It is worth mentioning that negative confirmation tests were obtained in 14.5% of the drivers previously recognized as positive in screening analyses. Therefore, an improvement in the protocols currently applied to DUIA and DUID assessment is needed, and confirmation tests on the blood should be considered mandatory in demonstrating a violation of the Road Traffic Act.

Driving Under the Influence, Blood Alcohol Concentration, Road Traffic Crashes