

K19 Driving Under the Influence of Alcohol (DUI) and Drugs (DUID) in Southern Italy: Case Reports Showing the Necessity of a Multidisciplinary Protocol to Prove DUI and DUID

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Learning Overview: After attending this presentation, attendees will better understand the need to standardize laboratory protocols for alcohol and drugs analysis on blood and urine specimens, as well as protocols for police, physicians, and first aid doctors to verify whether drivers involved in road accidents are impaired.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing how only synergistic cooperation among police, physicians and first aid doctors, forensic toxicologists, and forensic engineers allows for solving the question regarding driving impairment.

Driving impairment is not easy to assess because of a variety of factors, which include prior exposure to drugs, degree of both acute and chronic tolerance, innate physical condition, and associated limitations.¹ Studies regarding toxicological findings among drivers hospitalized after a crash are still insufficient and not consistent either in sampling or in the analytical approach. Moreover, in Italy, toxicological analyses and impairment studies after car crashes are not routinely performed by hospital personnel but must be requested by a public prosecutor.² The most frequently used protocols in the clinical laboratory are urine immunoassay drug screenings and serum alcohol enzymatic tests. Generally, biological samples analysed are not preserved.

Reported here are three emblematic cases for discussion in which the prosecutor's office ordered the seizure of blood and urine samples taken from possibly impaired drivers and asked the court for forensic toxicological analyses.

A 20-year-old male crashed frontally with another car: only A survived. Toxicological analyses showed the presence of alcohol in blood and urine, respectively 2.01 and 2.13g/l. The biological samples were taken 51min after the car accident. The judge charged A with voluntary murder, regardless of the possible intoxication from alcohol, because the officers present at the crime scene declared A was able to understand and was not impaired.

A 37-year-old man hit a motorcycle with his car and killed the biker. The toxicological analyses showed the presence of morphine (0.23µg/l), 6-MAM (0.04µg/l), and Δ9THC (0.104 µg/l) in the blood and the presence of morphine (>1.00µg/l) and Δ9THC-COOH (>0.16 µg/l) in the urine. The biological samples were taken 1 hour and 57 minutes after the car accident. A forensic engineer showed that D had started to brake too late, with a delay of 2 seconds after the impact. The judge charged D with road murder aggravated by impairment (related to the presence of psychoactive substances in blood and to the engineer statement), even though the paramedic declared D was able to understand and was not impaired.

B, a 40-year-old man, lost control of his car and violently crashed into the car of F, who died. The toxicological analyses showed the presence of 7-aminoclonazepam (74ng/ml), methadone, and 2-Ethylidene-1,5-Dimethyl-3,3-Diphenylpyrrolidine (EDDP) (respectively 5,386ng/ml and 5,648ng/ml) in the urine. A blood sample, negative for alcohol, was thrown away. The judge charged B with road murder, but he was not declared drug impaired, even though the policeman stated he was "definitely confused."

In conclusion, only a synergistic cooperation between police, physicians and paramedics, forensic toxicologists, and forensic engineers allows solving the question of whether drivers are drug/alcohol impaired during driving.

As part of the same protocol, drivers hospitalized after a crash should be subjected to blood and urine sampling for clinical purposes and toxicological screening. Blood and urine must be preserved at -20°C for the next forensic toxicological step. The toxicological tests could highlight if alcohol and drugs—and their metabolite—are present in the blood and in what concentrations. However, we must be careful because, at the current time, specific drug concentration levels cannot reliably be equated with a specific degree of driver impairment. Moreover, as time elapses between a car crash and the medical examination/biological samples collection, the statement and the roadside tests of a law enforcement officer become crucial to help assess whether a driver is impaired. Officers and paramedics should be trained to identify signs and symptoms of drivers impaired by drugs other than alcohol. Hence, a blood test must be able to link drug presence to the observed impairment. Finally, the timing and dynamics of the impacts should always be monitored by a forensic engineer.

Reference(s):

1. Moffat A.C., Osselson M.D., Widdop B. *Clarke's Analysis of Drugs and Poisons*, 4th Edition. Pharmaceutical Press, 2011.
2. Borriello R., Carfora A., Petrella R., Cassandro P. Trends of ethanol and illicit drug use among drivers involved in traffic crashes in Campania (Italy) during 2009-2014. *Proceedings of the 53rd International Association of Forensic Toxicologists*; 2015, Florence (Italy) 213.

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