DRIVERS INVOLVED IN ACCIDENTS AND SUSPECTED UNDER INFLUENCE


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ABSTRACT
This paper reports the results of chemico-toxicological analyses carried out on biological fluids of car drivers involved in road crashes and suspected to be under influence of psychoactive substances. The sample population is composed of 269 car drivers, who were accompanied by police patrols to the Emergency Department of Padova General Hospital during the period January 1996 - March 2002. Results were compared with data collected in a survey carried out on car drivers in the Veneto region during weekend nights.

INTRODUCTION
This study was carried out to investigate which kind of psychoactive substances were most frequently used by drivers involved in road crashes and the skill of police in recognizing subjects under influence.

METHODS
Chemico-toxicological analyses were carried out on biological fluids of car drivers involved in traffic crashes and suspected to be under influence of psychoactive substances. The study covered the period from January 1996 to March 2002. Drivers were accompanied by police patrols to the Emergency Department of Padova General Hospital. Immunochemical, GC-HS and GC-MS/SIM techniques were used on both blood and urine samples.

The following variables were considered:
- sex;
- age;
- time of accident;
- identification and quantitation of psychoactive substances in the blood and in the urine.

RESULTS
In the study period, 269 subjects were taken to hospital for toxicological ascertainments. Almost all subjects were young (29 ± 7.27 years) males (94%). Figure 1 shows distribution of sample by age.
Figure 1: Distribution by age.

About 85% of subjects had consumed either ethyl alcohol or psychoactive substances (Fig. 2).

Figure 2: Identification of psychoactive substances or alcohol in biological fluids.

About 65% of subjects were positive for psychoactive substances. The substances most frequently found were (in order): opiates, ethyl alcohol, cocaine, methadone, cannabinoids, amphetamines (Fig. 3). A high prevalence was found even for some medications (BDZ and barbiturates).
Ethyl alcohol was found in the blood and urine of 24% of subjects. Figure 4 shows the distribution of BAC (blood alcohol concentration) in the whole sample. About 25% of subjects had BACs over the current legal limit in Italy (80 mg/100mL).

Data must be interpreted considering multiple intake. Figure 5 shows data for subjects who were positive for several substances contemporaneously.
As well as many data of social and behavioural interest, processing of results demonstrated that:

- about 85% of subjects had consumed both alcohol and psychoactive substances;
- about 65% of subjects were positive for psychoactive substances;
- the substances most frequently found were (in order): opiates, cocaine, methadone, cannabinoids and amphetamines;
- a high prevalence was found even for some medications (BDZ and barbiturates);
- about 25% of subjects had BAC over the legal limit in Italy (80 mg/100mL);
- most of them had BACs more than the double the above limit.

These results were compared with those of another epidemiological study on a sample of drivers stopped by police and suspected of DUI during weekend nights from June 1994 to January 1999.

The data recovered in the present study are very different from those obtained on DUI during weekend nights (2000 subjects in the period 1994-1999) in which:

- about 18% of subjects were positive for psychoactive substances;
- the substances most frequently found were (in order): cannabinoids, cocaine, opiates and amphetamines;
- about 25% of subjects had BACs over the legal limit in Italy (80 mg/100mL);

**DISCUSSION**

This work reports the results of routine checks carried out by our Toxicology Service on drivers involved in road accidents and taken to the Emergency Department of Padova Hospital, because they were suspected by police of being under the influence of psychoactive substances (alcohol and drugs). Data were compared with results from an epidemiological study on car drivers, also suspected of being under the influence of psychoactive substances, but not involved in accidents and driving during night hours at weekends.

Comparison of the results of the two studies revealed two important facts:
- People driving during night hours at weekends and suspected of being DUI by police were more frequently positive for alcohol and substances like cannabinoids and psychoactive substances.
- The intake patterns of subjects suspected of being DUI and involved in accidents were quite different, subjects positive on toxicological analysis for opiates clearly prevailing.

These results may be explained by the following three hypotheses:

1. It is relatively difficult for policemen to recognize a subject under the influence of cannabinoids if a driver is involved in an accident, but the same policemen can easily notice psychophysical alterations in the behaviour of drivers taking cannabis and driving on Saturday nights;
2. Opiates are frequently found among substances taken by subjects involved in road accidents, because the capacity of such substances to cause the psychomotor alterations which give rise to road accidents is extremely marked;
3. Policemen submit drivers already known to them from previous occasions (repeated road accidents, known drug addicts) to toxicological ascertainment.

In conclusion, this study - although limited as it has no control groups and is not representative of the entire population involved in road accidents - does indicate that opiates are the psychoactive substance responsible for the most marked psychomotor alterations in subjects driving motor vehicles/car drivers and thus at greater risk of causing accidents.

REFERENCES