

Epidemiological roadside survey on psychoactive substances and driving in the Veneto Region (North-East Italy)

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Abstract

Objective: this study investigated the role of psychotropic substances (alcohol, drugs of abuse) in causing road accidents.

Methods: survey based on clinical and chemico-toxicological analyses carried out on car drivers in the Veneto region during night weekends since 1994. Rapid clinical screening was carried out on 7957 drivers. 1399 of these, suspected to be under the influence of psychotropic substances, were subjected to complete clinical and toxicological ascertainment involving the following procedures:

- 1) anamnesis, aiming at evidence of possible current or past use of psychotropic substances;
- 2) objective clinical examination, aiming at finding evidence of recent (signs of acute or chronic intoxication) or past use (signs of withdrawal or associated organic pathologies) of psychotropic substances; c) double sampling of blood and urine and chemico-toxicological analysis using immunochemical, GC-HS and GC/MS-SIM techniques.

Results: As well as many data of social and behavioural interest, processing of results demonstrated that:

- a) 56.25% of drivers examined had consumed alcoholic beverages;
- b) 30.16% had BACs higher than the threshold permitted in Italy (80 mg% mL);
- c) 15.65% of drivers were found to be under the influence of drugs of abuse or psychoactive drugs;
- d) the most frequently found substances were (in order): cannabinoids, stimulants (cocaine, amphetamines), opiates.

Conclusion: the prevalence of drivers under the influence of drugs and alcohol is very high in Italy. The lack of proper prevention/education programs and of any deterrent effect, due to the non-application of laws in force, means that at-risk behaviour remains at high levels. Italy needs to extend the isolated prevention programs undertaken so far and to set up a permanent service of clinical and toxicological checks to be applied throughout the country.

Introduction

Deaths due to road accidents during weekends have become a worrying phenomenon in Italy. Nevertheless, the frequency and prevalence of alcohol and psychoactive substances in the driving population not involved in road accidents have occasionally been investigated in Italy.

Articles 186 and 187 of Law no. 295/92 (New Highway Code) define driving in a condition of drunkenness due to alcohol (Art. 186) and under the influence of psychoactive substances (Art. 187), and fix the maximum permitted BAC at 80 mg%_{mL}. They also define how the BAC is to be checked, general procedures for ascertainment of driving under the influence of drugs, and penal sanctions for those in a state of drunkenness and for those who refuse to cooperate with the authorities.

With the aim of highlighting the role of psychotropic substances (alcohol, drugs of abuse) in causing road accidents, a survey based on clinical and chemico-toxicological analyses has been carried out on car drivers in the Veneto region during night weekends since 1994.

Methods

Ascertainments were carried out between 1.00 a.m. and 7.00 a.m. on Saturday or Sunday mornings in 2 to 7 provinces (the variability depending on the season) of the Veneto Region (population about 4 million).

The method of working was set up in collaboration with the Regional Police Department and the regional delegation of the Red Cross.

Surveys were carried out by medical teams operating in conjunction with highway police patrols equipped with radio-controlled speed checking instruments and breathalyzers.

Each medical team was composed of one forensic doctor specializing in ascertaining driving ability and 2 Italian Red Cross volunteers. Personnel operated inside a Red Cross ambulance equipped with instrumentation for emergency intensive care, ordinary health care, and a chemical toilet.

Materials included (a) forms for clinical and forensic ascertainments; (b) kits for double sampling of blood and urine (analysis and counter-analysis); (c) kits for on-site toxicological screening tests of urine (Syva Rapid Test); (d) portable refrigerators for preserving samples.

Procedures were as follows:

By highway police:

- Analysis of expired air, by breathalyser.
- Request for consent to medical ascertainment.

By toxicologico-forensic service:

- 1) Request for informed consent to clinical ascertainment and sampling of biological fluids.
- 2) Certification of possible refusal of clinical ascertainment and report to highway police.
- 3) Rapid clinical assessment by ophthalmological and neurological tests.
- 4) On-site rapid toxicological screening for drugs of abuse in urine.
- 5) Complete specialized clinical ascertainment on selected subjects by application of standardized procedure: anamnesis, aiming at evidence of possible current or past use of psychotropic substances; objective clinical examination, aiming at finding evidence of recent (signs of acute or chronic intoxication) or past use (signs of withdrawal or associated organic pathologies) of psychotropic substances.
- 6) Sampling of blood and urine for analysis and counter-analysis.
- 7) Guarantee of a proper chain of custody.
- 8) Search for drugs and psychoactive substances by means of a standardized analytical procedure (using immunochemical, GC-HS and GC/MS-SIM techniques) on blood and urine samples identified by the label "Analyses".
- 9) Freezing and preservation for a minimum period of 6 months of blood and urine samples (identified by the label "Counter-analyses"), available to examined subjects for possible counter-analysis.
- 10) Compilation and sending of response forms to highway police offices.

Results

Rapid clinical screening was carried out on 7957 drivers. 1399 of these, suspected to be under the influence of psychotropic substances, were subjected to complete clinical and toxicological ascertainment. Table 1 lists the main characteristics of the final study population.

Table 1. Characteristics of population examined

| Sex | No | % | Age | n. | % |
|--------------------|------|-------|------------------------------|------|-------|
| Male | 1331 | 95,14 | < 20 | 185 | 13.31 |
| Female | 68 | 4.86 | 21-25 | 572 | 41.15 |
| | | | 26-30 | 351 | 25.25 |
| Status | | | 31-35 | 168 | 12.08 |
| Unmarried | 1215 | 87.54 | >35 | 114 | 8.21 |
| Married | 137 | 9.87 | Not available | 9 | |
| Legally separated | 33 | 2.38 | | | |
| Divorced | 3 | 0.21 | Schooling | | |
| Not available | 11 | | None | 2 | 0.15 |
| | | | Primary school | 51 | 3.71 |
| Coming from | | | Middle school | 649 | 47.16 |
| Disco | 593 | 42.63 | High school | 361 | 26.24 |
| Other public place | 443 | 31.85 | Prof. Diploma | 270 | 19.62 |
| Private house | 223 | 16.03 | University degree | 43 | 3.12 |
| Other places | 132 | 9.49 | Not available | 23 | |
| Not available | 8 | | | | |
| | | | Degree of licence | | |
| Employment | | | A (Motorcycles) | 6 | 0.43 |
| Employed | 1231 | 88.31 | B (Cars) | 1158 | 84.09 |
| Unemployed | 76 | 5.45 | C (Trucks) | 104 | 7.55 |
| Student | 83 | 5.95 | D-E-F (Big trucks and buses) | 97 | 7.04 |
| Retired, other | 4 | 0.29 | No licence | 12 | |
| Not available | 5 | | Not available | 22 | |

56.25% of drivers examined had consumed alcoholic beverages; 30.16% had BACs higher than the threshold permitted in Italy (80 mg% mL); 15.65% of drivers were found to be under the influence of drugs of abuse or psychoactive drugs (Fig. 1); the most frequently found substances were (in order): cannabinoids, stimulants (cocaine, amphetamines), opiates (Fig. 2).

Fig. 1 Drivers under the influence of alcohol and drugs.

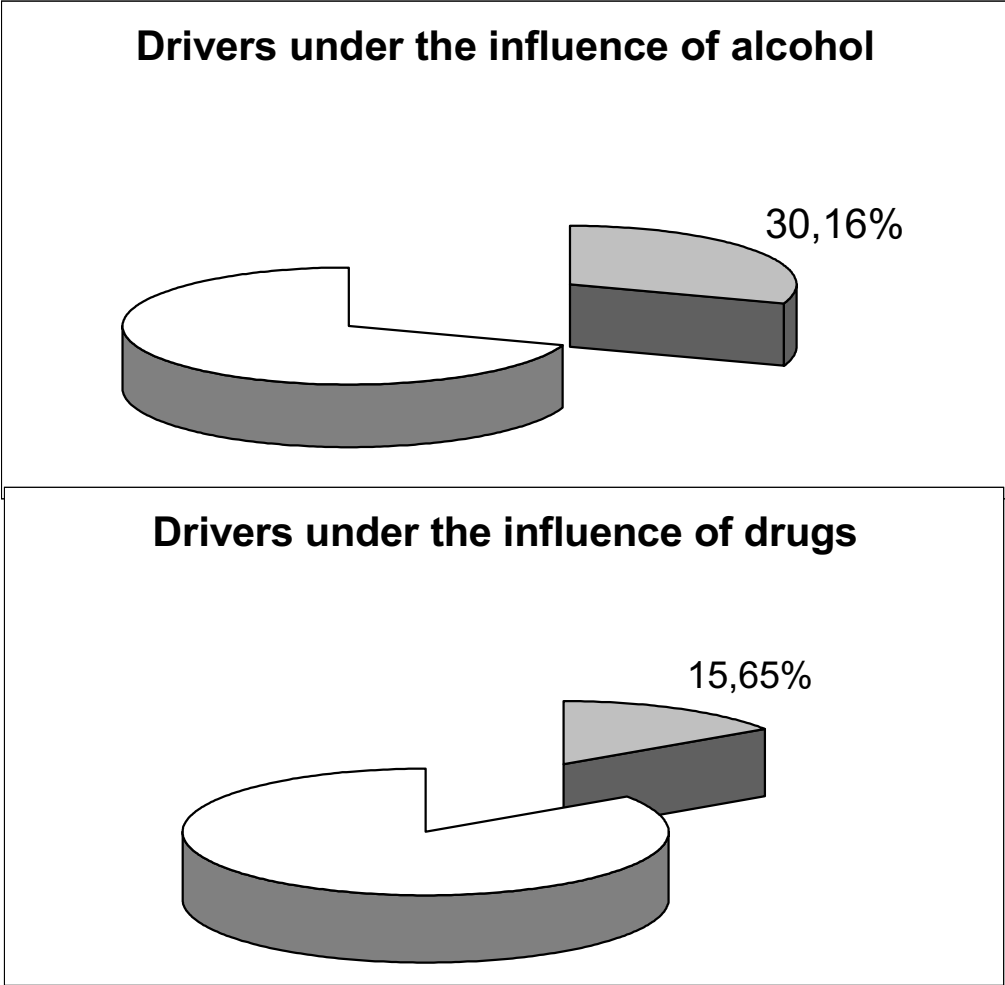


Fig. 2 Psychoactive substances in biological fluids.

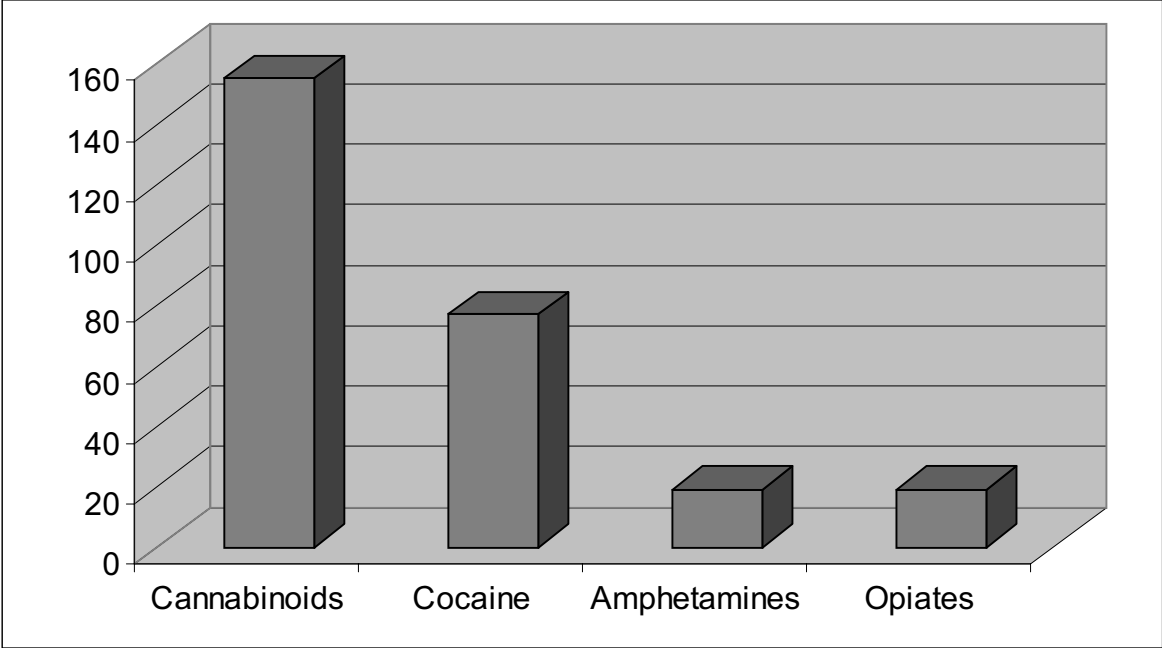


Fig. 3 Blood alcohol concentrations

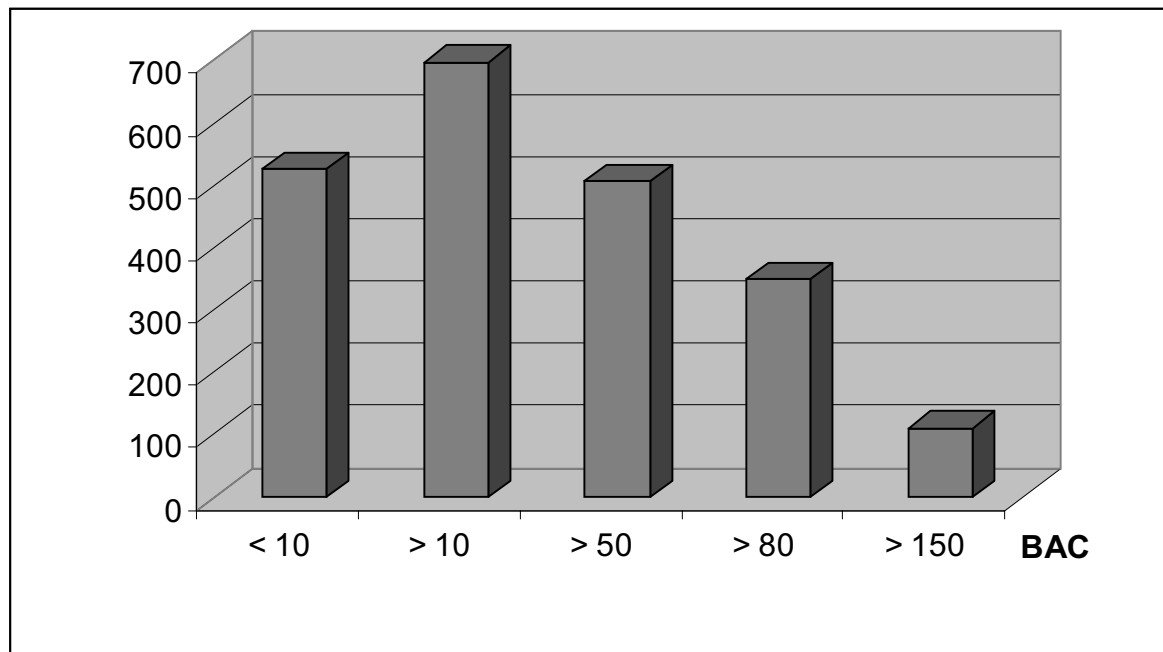
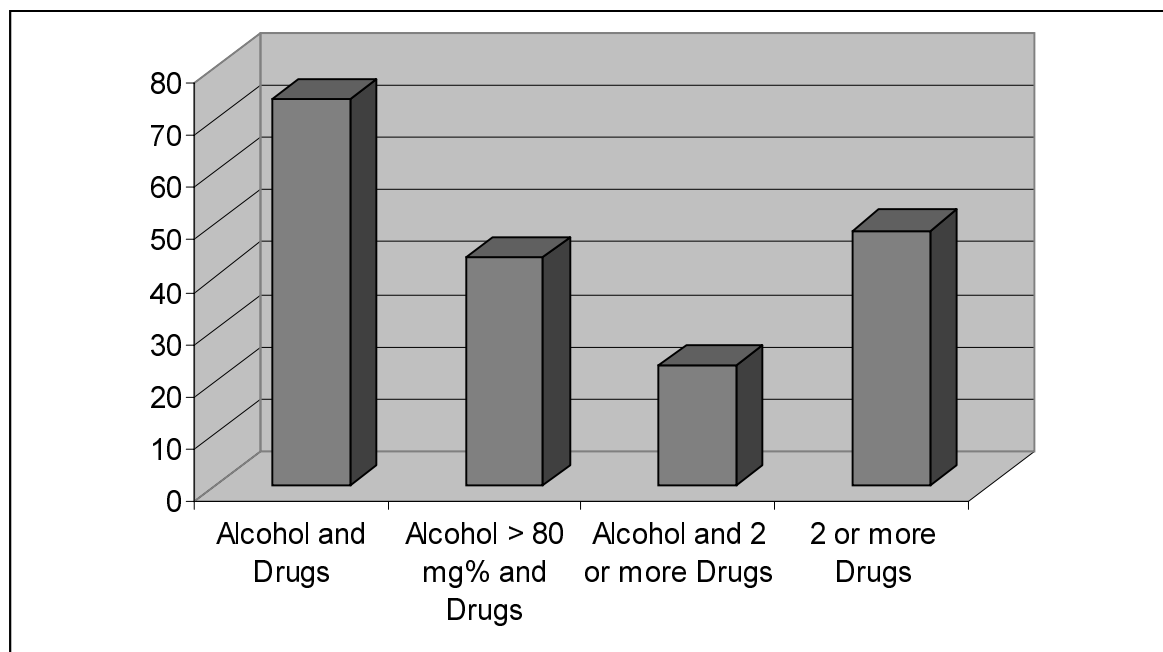


Fig. 4 Multiple intake of psychoactive substances



Discussion

The results of this study lead to the following considerations:

- in the population examined (driving at night at weekend) there is a high frequency of subjects under the influence of drugs and alcohol;

- most drivers had taken cannabinoids or psychostimulants;
- the complex psychopharmacological effects of these substances probably explain dangerous behavior on roads which leads to a high number of accidents among young people over the weekends;
- the lack in Italy of proper prevention/education programs for young people and of any deterrent effect, due to non-application of laws in force, produce the twofold result of maintaining at-risk behavior at high levels;
- Italy needs prevention programs and appropriate deterrent effects by setting up a permanent service of clinical and toxicological checks, to be applied throughout the country.

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