

## Illicit Drugs among Crashed Drivers, A First Toxicological Investigation in Albania

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### Abstract

This study aims to investigate the presence of drugs in this group of drivers who already had a crash (injured or killed drivers). By law, the prosecutor is the authority who requests the toxicological examination specifying the type of analysis that will be performed, usually only alcohol test is required. There has been some investigation regarding the influence of alcohol in traffic crashes in Albania (3,190,089 inhabitants), but never a research regarding the use of illicit and medicinal drugs in drivers in our country. Alcohol was analyzed in blood by head-space gas-chromatography. Blood samples were also screened for psychoactive substances (opiates, cocaine metabolites, cannabis, amphetamines, methamphetamines, benzodiazepines, tricyclic antidepressants, barbiturates) by immunological methods. Their presence was confirmed by gas-chromatography.

Overall, 82 car drivers were included in the study. Drivers involved in accidents were more frequently men 98.8% (n=81). 46 drivers (56.1%) had a positive blood alcohol concentration at the time of the crash, but only 23 (28%) had toxic concentrations exceeding 1.2 g/l. In total, 15.9% were positive for illicit drugs and medicinal drugs. This study revealed that beside alcohol, psychoactive substances were present in Albanian crashed drivers, too.

**Keywords:** Albania; Drugged driving; Toxicological investigation

### Introduction

The effects of alcohol consumption on safety behavior of drivers have been reported in different studies [1-4]. But, research had shown that illicit drugs and psychoactive medicinal drugs may increase the risk of traffic accidents [5-11]. Driving under the influence is considered as one of the main causes of road crashes, it is a continuous concern for road safety. The most important research projects carried out in the EU aimed to quantify the size of the drink- and drug driving problem in Europe; it was shown that the injured or killed drivers, the most commonly consumed substance was alcohol alone, followed by alcohol combined with other substances [12,13]. Similar investigation took place in different European countries and a number of studies on drink and drug driving were published [14-20]. Regarding Albania, alcohol investigations are performed in crashed drivers [21,22] but it is never investigated about the use of drugs of abuse among drivers involved in road crashes.

According to Republic of Albania's law on Road Traffic Safety (2011 amendment), it is prohibited driving after drinking or consuming illicit drugs and psychoactive substances. The sanctions for driving in these conditions include monetary fines, detention and suspension of the driving license. In each road accident, if there are injuries or medical assistance is needed, the analyses of blood alcohol concentrations are required from the police officers [23].

The Laboratory of Forensic Toxicology of the Institute of Forensic Medicine in Tirana is the only one, authorized to perform the toxicological investigation of traffic accidents that happen all over the country (population 3.190.089).

The police officers usually request blood sampling of injured drivers or legal autopsy of deceased drivers, the blood samples are analyzed only for alcohol. The collection of urine is not a standard practice. This study aimed to investigate the presence of illegal drugs and psychoactive medicinal drugs among the crashed drivers in our country.

### Materials and Methods

We considered 82 blood samples of crashed drivers from all country (selection criteria were applied), from January to December 2012, which were analyzed for both alcohol and drugs.

These cases represented only a portion of total accidents happened in that period (153 in total) which fulfill the selection criteria as following:

- Drivers injured or killed in traffic accidents.
- Time interval between the accident and sampling of less than 1 hour.
- Sufficient blood available, to perform alcohol and drug analyses.
- There were available data regarding: age of the person involved in accident, time of accident happened and time of blood sampling.

The rest of the blood samples from drivers involved in road accidents during that period, were analyzed for ethanol alone.

Blood sampling, was done shortly after the accident, venous blood was taken by a physician or nurse in the presence of police officer, using 5cc sterile tubes containing anticoagulants.

In fatal cases, heart blood samples were taken at autopsy, using

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sterile plastic containers. Blood samples were stored at +4°C till they were analyzed, normally within one week, and thereafter frozen at about -20°C for a 3 month period.

Ethanol analysis was performed in 0.5 ml of whole blood of the every sample was performed by a headspace gas chromatograph (Shimadzu) with a flame ionization detector using t-butanol as the internal standard, utilizing a GC head-space method [24]. One sample was measured twice and the mean value was reported. A sample was considered positive for alcohol when blood alcohol concentration was over 0.1 g/l.

In addition each blood sample was screened for the presence of drugs by an immunological method (AxSym Abbot). The cut-off levels of the first screening were: opiates 250 ng/ml; cocaine metabolite 200 ng/ml; cannabinoids 20 ng/ml; amphetamines 300 ng/ml; benzodiazepines 250 ng/ml, barbiturates 200 ng/ml and tricyclic antidepressants 200 ng/ml. All positive screening results were confirmed by analyzing blood with gas-chromatography-mass-spectrometry (GC-MS by Shimadzu) using single ion monitoring, according to the standardized methods and procedures recommended in the “Manuals for use by National Laboratories by United Nations Drug Control Program” [25,26]. Statistical analyses were performed running the SPSS/PC program.

## Results

A total of 153 persons injured or killed in road crashes in Albania during the year 2012 were submitted to Institute of Forensic Medicine for analyses of alcohol; the analytical results presented in this report are based only on 82 blood samples (54%), which were analyzed for ethanol and drugs too. Drivers involved in accidents were more frequently men 98.8% (n=81). 46 drivers (56.1%) had a positive Blood Alcohol Concentration (BAC ≥ 0.1 g/l) at the time of the crash, but only 23 (28%) had toxic concentrations exceeding 1.2 g/l. Drivers with positive BAC were all men. It cannot be shown any significant increase of the BAC prevalence along decades of age, but it declines in ages over 60 years. Psychoactive substances, other than alcohol, were detected in 13 cases (15.9%); in combination with alcohol in 5 cases (6%); (benzodiazepines in 3 cases and MDMA in 2 cases). In total illicit drugs are found in 6% (n=5) respectively: cocaine (n=1; 1.2%); methamphetamine (n=1; 1.2%), MDMA (n=3; 2.4%); and regarding medicines the only one founded was diazepam, in 9.8% of crashed drivers (n=8) (Table 1).

We have not found any significant correlation between alcohol and/or drug positive cases and age, but we can notice that drugs are mostly used by 18 to 29 years old drivers.

The mean values of BAC for each age group were as follow: in under 29 years old drivers 0.49 ± 0.61; in 30-39 age group 0.68 ± 0.76; in 40-49 age group 1.19 ± 1.19; in 50-59 age group 0.99 ± 0.96; in 60-69

age group 0.48 ± 0.73 and in over 70 0.14 ± 0.17. We found the higher BAC mean value in 40-49 year old drivers. BAC mean value was higher during weekend 0.83 ± 0.97 compared to working days 0.67 ± 0.92. The highest BAC value was 3.344 g/l in 40-49 age groups.

The distribution of fatal cases in relation to time period of the week, age groups and blood alcohol concentration are presented in Table 2. (Night time from 18:00 to 5:59, weekend from Friday evening 18:00 to Monday morning 5:59).

## Discussion

There has been an increase of road crashes and fatal cases during the five year period 2010- 2013 in Albania. Based in the Institute of Forensic Medicine database, sample distribution of fatal cases according to year was as follows: 2010, 60; 2011, 46; 2012, 71; 2013, 91. This was a modest study, based in a small number of cases but it was the first approach to analyze drugs in drivers involved in traffic accidents since it is not in the protocol of police officers to ask other than alcohol. Regarding to this study, alcohol was the most frequent (56.1%) drug found and the highest blood alcohol concentration mean value was detected in 40-49 years old drivers. Our results are similar to those found in studies of alcohol in blood samples in other countries like Spain 44-50%; USA 41-52%, Canada 35-48%, Norway 37.8%, Greece 29-37% [27-31]. Our findings show the presence of illegal drugs (6%) and medicinal drugs (9.8%) in drivers where combination of alcohol with drugs was found in 6% of cases, but further investigation and a bigger number of cases analyzed are needed to come to a conclusion. It is hard to compare with other countries findings because of the different study design and limited number of cases analyzed, but it is worth to notice that the most prevalent drug used was the benzodiazepines group (diazepam only). This is a similar finding to other European country [12]. We suppose using of diazepam is related to the easy way finding it and the low price. Regarding the age group of drivers consuming drugs, it is normal that young people dominate the picture (18-29 years old). Referring to European studies the most prevalent drug found in driver involved in road accidents is THC; but we can notice that cannabis is missing in our findings; maybe it is more popular and more used by teenagers group, which is not included in our study.

## Conclusion

This study performed in 2012 revealed that beside alcohol, psychoactive substances are present in Albanian crashed drivers, too. The most commonly found illicit drug group was amphetamines, and the only group of medicinal drugs founded was the benzodiazepines. It shows that male drivers between 20 and 40 years are more likely to be involved in road accidents. Systematic future studies will help to estimate the drug use by drivers in our country. We recommend that a

Drivers characteristics	BAC=0	%	0.1≤BAC<0.5	%	0.5≤BAC<1.2	%	BAC≥1.2	%	Illicit Drugs	%	Medicinal	%
<b>Gender</b>												
Male	35/81	43.2	Sep-81	11.1	14/81	17.3	23/81	28.4	May-81	6.2	Jul-81	8.6
Female	1-Jan	100	0	0	0	0	0	0	0	0	Jan-81	1.2
<b>Age</b>												
18-29	23-Nov	47.8	23-Mar	13	23-May	21.8	23-Apr	17.4	23-Mar	13	23-Jun	26.1
30-39	17-Jun	35.4	17-Mar	17.6	17-Apr	23.5	17-Apr	23.5	17-Feb	11.8	17-Jan	5.9
40-49	18-Jun	33.3	18-Feb	11.1	18-Feb	11.1	18-Aug	44.4	0	0	18-Jan	5.6
50-59	12-May	41.6	0/12	0	12-Feb	16.6	12-May	41.6	0	0	0	0
60-69	9-Jun	66.7	0/9	0	9-Jan	11.1	9-Feb	22.2	0	0	0	0
≥ 70	3-Feb	66.7	3-Jan	33.3	0/3	0	0/3	0	0	0	0	0

**Table 1:** Frequency of alcohol (BAC in g/l) and drug users in relation to gender and age groups.

	Nr. of fatal cases	% of total drivers
<b>Gender</b>		
Male	48	58.5
Female	0	0
<b>BAC g/l</b>		
BAC=0	22	26.8
0.1≤BAC<0.5	7	8.5
0.5≤BAC<1.2	6	7.3
BAC≥1.2	13	15.9
<b>Drugs</b>		
Diazepam	6	7.3
MDMA	3	3.7
Methamphetamine	1	1.2
<b>Age</b>		
18-29	15	18.3
30-39	8	9.8
40-49	6	7.3
50-59	10	12.2
60-69	6	7.3
≥ 70	3	3.7
<b>Weekday</b>		
working	25	30.5
weekend	23	28
<b>Day/night</b>		
06:00-17:59	27	32.9
18:00-05:59	21	25.6

**Table 2:** Distribution of fatal cases by blood alcohol concentration, age groups and time period.

drug check should be performed in persons involved in road accidents, further than alcohol analysis.

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