

CLINICAL STUDY

Psychoactive substance-related deaths in road traffic accidents in Slovakia between 2000 and 2007

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Abstract: *The aim of the study:* Our study was aimed at fatal road traffic accidents caused under the influence of psychoactive substances different from alcohol.

Methods: Retrospective analyses of fatalities in 2000–2005 road traffic accidents under the influence of psychoactive substances different from alcohol on the behalf of National Monitoring Centre for Drugs were carried out in all of 10 Slovak medical forensic workplaces supervised by Healthcare Surveillance Authority. The detected set of cases was extended by cases reported in 2006 and 2007.

Results: A total of 75 fatalities in road traffic accidents were reported to be incurred under the influence of psychoactive substances. Of the latter amount, 42 cases occurred in the period 2000–2005 and 33 cases in 2006 and 2007. The set involved 32 drivers, 12 pedestrians, 4 motorcyclists, 2 cyclists and 25 passengers. The most frequently detected substances in the period 2000–2005 were cannabis and benzodiazepines. In 2006 and 2007 the increase in substances classified as central nervous system stimulants was detected.

Conclusion: The listed number of reported deaths incurred in the whole territory of Slovakia during the 8-year period is relatively low in comparison with the total number of fatal road traffic accidents. The proved reality represents only the tip of the iceberg and suggests that the monitoring of prevalence of psychoactive substances in population had some drawbacks (*Tab. 4, Ref. 8*). Full Text (Free, PDF) www.bmj.sk.

Key words: fatal traffic accidents, psychoactive substances, National Monitoring Centre for Drugs, Healthcare Surveillance Authority.

After the change in social system in Slovakia, particularly illicit addictive psychoactive substances invaded the market and triggered an increase in the number of their users, both occasional and chronic ones. This problem affects all areas of social life, and thus becomes one of the factors influencing the traffic safety.

In 1999, a study on drug abuse among drivers in different European countries concluded, that the prevalence of drug use was probably in the range of 1 % to 5 % for illicit drugs and of 5 % to 15 % for licit drugs. Cannabis and benzodiazepines are perhaps the two psychoactive substances most commonly used by drivers, apart from alcohol (1). They both have high prevalence and with great likelihood can affect their driving ability. From the legal point of view, there are differences between them

since one is an illicit drug, while the others are easily accessible medicaments. Extensive research has proved that only a small dose of cannabis deteriorates many functions, which considerably condition safe driving. Furthermore, a combination of a small amount of alcohol together with a small dose of cannabis causes a very serious impairment of driving abilities (2).

After Slovakia had joined the European Union, the monitoring of drug-related deaths for the needs of European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) was started in the territory of Slovakia. Deaths related to the influence of psychoactive substances in road traffic accidents belong to a group of so-called indirect drug-related deaths (3).

Methods

The study analyses a retrospective collection of death cases incurred by traffic accidents that took place within the period from 2000 to 2005 in Slovakia and were related to psychoactive substances other than alcohol. The study was done upon the requests of European Monitoring Centre for Drugs and Drug Addiction and Slovak National Monitoring Centre for Drugs, which decided to focus not only on alcohol in road traffic, but also on other psychoactive substances. In Slovakia, the collected 2000–2005 retrospective data are targeted especially on cannabis and benzodiazepines. The study was not aimed at fatal road traffic accidents caused under the influence of alcohol itself (4).

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Acknowledgements: The author is grateful to Healthcare Surveillance Authority and to all workers of Slovak medical forensic workplaces as well as to National Monitoring Centre for Drugs for the support and cooperation in contributing to data collection.

Further thanks go to Anna Cibulková from the Institute of Foreign Languages of Faculty of Medicine, Comenius University in Bratislava, Slovakia for the English revision of the manuscript.

Tab. 1. Distribution of fatalities according to workplaces and years.

Workplace/No. fatalities/ Year	2000	2001	2002	2003	2004	2005	2006	2007	Together
Bratislava (WS)	4	4	1	3	2	7	5	6	32
N. Zámky (WS)	–	–	–	–	–	–	2	1	3
Nitra (WS)	–	–	–	–	–	–	–	–	–
Žilina (MS)	–	–	3	–	–	–	–	–	3
Martin (MS)	–	–	4	2	1	–	2	4	13
B. Bystrica (MS)	–	–	–	–	–	–	–	2	2
Lučenec (MS)	–	–	–	–	–	–	2	1	3
Poprad (ES)	–	–	–	–	–	–	1	–	1
Prešov (ES)	–	–	–	–	–	–	–	3	3
Košice (ES)	3	2	–	1	4	1	4	–	15
Together	7	6	8	6	7	8	16	17	75

WS – West Slovakia, MS – Middle Slovakia, ES – East Slovakia

Tab. 2. Categorisation of fatalities in road traffic accidents according to sex and age.

Fatalities/ Sex/Age	Drivers M/W	Pedestrians M/W	Motorcyclists (drivers) M/W	Cyclists M/W	Passengers M/W	Together M/W
>14	–/–	–/–	–/–	–/–	1/–	1/–
15–19	3/–	2/1	–/–	–/–	2/3	7/4
20–24	13/–	1/–	2/–	–/–	6/2	22/2
25–29	4/1	1/–	2/–	–/–	6/1	13/2
30–34	3/–	2/–	–/–	–/–	1/1	6/1
35–39	1/–	1/–	–/–	1/–	2/–	5/–
40–44	1/–	1/–	–/–	–/–	–/–	2/–
45–49	–/–	–/–	–/–	–/–	–/–	–/–
50–54	2/–	1/–	–/–	1/–	–/–	4/–
55–59	1/–	–/–	–/–	–/–	–/–	1/–
60–64	3/–	–/–	–/–	–/–	–/–	3/–
65 <	–/–	2/–	–/–	–/–	–/–	2/–
Together	31/1	11/1	4/–	2/–	18/7	66/9 (75)

M/W – men/women

Retrospective analyses of fatalities in road traffic accidents under the influence of psychoactive substances were carried out in all 10 Slovak medical forensic workplaces supervised by Healthcare Surveillance Authority. The results from each workplace were collected and assessed. The detected set was extended by cases reported in 2006 and 2007 by means of continuously executed monitoring of deaths related to psychoactive substances.

The data were obtained from autopsy reports, since in all reported cases the autopsy and complex toxicological examination had been performed.

Results

The majority (80 %) of fatalities in road traffic accidents under the influence of psychoactive substances were reported from the workplaces in Bratislava (32 cases), in Košice (15 cases) and in Martin (13 cases). Six workplaces reported that no such cases occurred in their region in the period 2000–2005. During this 6-

year period, there was a total of 42 deaths reported to be related to psychoactive substances in road traffic accidents. In 2006 and 2007, other 33 cases of fatalities were reported to occur in road traffic accidents under the influence of psychoactive substances. A detailed distribution of cases according to workplaces and occurrence years is shown in Table 1.

In the above-mentioned cases, there were included 32 drivers (42.7 %), 12 pedestrians (16 %), 4 motorcyclists (5.3 %), 2 cyclists (2.7 %) and 25 passengers (33.3 %). Males were involved in 66 cases (88 %). Regarding the age of accident participants, 32 % of them were put into the group from 20 to 24 years, 20 % of them into the group from 25 to 29 years. In total, there were 76 % of cases in age group from 15 to 34 years. A detailed categorisation of fatalities in road traffic accidents according to age and sex is shown in Table 2.

The analysis showed that the most frequently detected substance was cannabis, either alone or in combination with other substances, namely in 35 cases, i.e. in 46.7 % of the total (54.8 %

Tab. 3. Categorisation of fatalities in road traffic accidents according to detected psychoactive substances.

Fatalities/ Detected substance	Drivers (Vehicles)	Pedestrians	Motorcyclists (Drivers)	Cyclists	Passengers (Vehicles)	Together
Amphetamine	4	–	–	–	7	11
+Ephedrine	1	–	–	–	–	1
Benzodiazepines	3	3	–	–	–	6
+AMT/MAMT	–	1	–	–	–	1
+AL	–	2	–	1	–	3
Cannabis	6	–	2	–	8	16
+AMT/MAMT	5	–	–	–	2	7
+AMT/MAMT,AL	–	–	–	–	1	1
+AL	3	2	–	–	3	8
+COC	1	–	–	–	–	1
+COC,ECS,AL	1	–	–	–	–	1
+Toluene	–	–	–	–	1	1
Cocaine	1	–	–	–	–	1
Heroin	–	–	–	–	–	–
+AMT/MAMT	–	–	–	–	1	1
MAMT	–	–	1	1	–	2
+ECS,AL	1	–	–	–	–	1
Medicaments	3	–	1	–	–	4
+AL	1	–	–	–	–	1
Methadone+AL	–	1	–	–	–	1
MDMA	–	–	–	–	1	1
Opioides	1	–	–	–	–	1
+AMT/MAMT,BZD	–	1	–	–	–	1
+BZD	–	–	–	–	1	1
Toluene	1	1	–	–	–	2
+AL	–	1	–	–	–	1
Together	32	12	4	2	25	75

AMT – amphetamine, BZD – benzodiazepines, AL – alcohol, ECS – ecstasy, COC – cocaine, MAMT – metamphetamine

Tab. 4. Distribution of groups of psychoactive substances detected in fatalities in road traffic accidents according to years.

GDPS/ Year	Cannabis	Benzodiazepines	Other PS	Together
2000	6	1	0	7
2001	2	2	2	6
2002	3	0	5	8
2003	3	1	2	6
2004	4	2	1	7
2005	5	1	2	8
2006	4	2	10	16
2007	8	1	8	17
Together	35	10	30	75

GDPS – group of detected psychoactive substances

in the period 2000–2005). In the same period, cannabis was followed by benzodiazepines, also alone or in combination with other substances, namely in 7 cases, i.e. in 16.7 %. In 2006 and 2007 an increase was detected in substances from group of central nervous system stimulants, amphetamines and methamphetamines in particular. In the group of substances other than

cannabis and benzodiazepines, central nervous system stimulants were detected in 15 of 18 2006 and 2007 cases, i.e. in 83.3 %. Moreover, medicaments (other than benzodiazepines), i.e. heroin, methadone, other opiates, and toluene alone or in combination were reported in total of 13 cases accounting for 17.3 % of all cases reported. Combination with alcohol was detected in total of 17 cases, i.e. in 22.7 %. Table 3 shows a detailed processing of toxicological analyses results according to particular psychoactive substances and their combinations due to the categorisation of fatalities in road traffic accidents.

Table 4 shows distribution of groups of fatalities incurred by traffic accident and related to psychoactive substances according to occurrence years.

Discussion

In terms of traffic safety and responsibility for preventing road traffic accidents, the analysis should be primarily aimed at drivers, pedestrians, motorcyclists and cyclists. Due to a small number of reported cases, passenger involvement was also considered. These cases included in the statistics showed an interesting fact that fellow passengers were almost all under the in-

fluence of psychoactive substances. In accordance with European trends in using psychoactive substances particularly cannabis that is on the top of the European list was involved (5). It is taken mainly by young males, the fact of which was also confirmed in this set. A little different results were obtained in a similar study on alcohol/drugs-related fatal traffic crash cases in Hong Kong, where the most frequently detected drugs were central nervous system stimulants including designer drugs like MDMA (46 %), cannabis (36 %), benzodiazepines (18 %) and ketamine (9 %) (6). In our study, similarly to the statistics of all fatalities related to psychoactive substances, benzodiazepines and medicaments, they were used by older age groups (7). According to the official statistics of the Department of Home Affairs of the Slovak Republic, approximately 600 people per year die in road traffic accidents, i.e. about 4,800 within the period 2000–2007 (8). The listed number of reported deaths related to psychoactive substances in road traffic accidents in the whole territory of Slovakia during the 8-year period is relatively low in comparison with the total number of fatal road traffic accidents. However, it is not the point to neglect this problem in Slovakia. The proved reality represents only the tip of the iceberg and suggests the faults in monitoring the prevalence of psychoactive substances in population. The reasons as to why these numbers do not sufficiently reflect the reality are several. Firstly, the human factor in both, retrospective and continuous data collection should be considered. It is assumed that there are workplaces where the mentioned autopsies were performed, but not reported. However, it is not assumed that there are significant differences between actual and reported figures in respect of fatal cases. Further reasons are practical involving particularly the costs of toxicological examinations. We think these examinations are not sufficiently requested at autopsy of fatalities incurred by road traffic accidents since the direct cause of death is generally evident in these cases. Accordingly, the fact that the deceased person actually caused the accident and thus there is nobody to be prosecuted leads to the opinion that toxicological examination is not inevitable. The present situation in monitoring the deaths related to psychoactive substances in road traffic accidents can be improved not only by obtaining financial resources for completing the equipment of toxicological laboratories of medical forensic workplaces, but particularly by purchasing reagents in the necessary amount for the need of detecting the presence and

determining the amount of psychoactive substances in deceased bodies and their relationship to death. It would be definitely interesting and probably necessary to expand the monitoring to all cases of death incurred by road traffic accidents should the financial resources be contributed by various state departments. The extension of the monitored set of 2000–2005 by cases reported in 2006 and 2007 would be of great benefit because since 2007, the monitoring of deaths related to psychoactive substances has been continuously performed in electronic form in co-operation between National Monitoring Centre for Drugs, and Healthcare Surveillance Authority. The latter cooperation has a positive effect on continuous monitoring, through which the annual tracing of monitored cases increased on average by 135 %.

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Received January 21, 2009.

Accepted May 5, 2009.