Prevalence of alcohol and illegal drugs in blood samples from adults involved in traffic law violations in the area of Frankfurt/Main (Germany)

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In Germany, it is estimated that in about 50% of the traffic accidents with fatalities, at least one of the involved people was under the influence of alcohol. Furthermore, the attention drawn to the problem of driving while impaired by a drug or medicament has increased.

AIM: to obtain an epidemiological profile of alcohol and illegal drug prevalence among adults involved in traffic law violations in South-Hessen (Germany).

METHODS: cross sectional study of toxicological analyses performed in the Center of Forensic Medicine Frankfurt/Main between January 1998 to December 2004 on adults (older than 18 years) involved in traffic law violations. 47.604 blood specimens were tested for alcohol using GC-HS/FID, whereas 12.405 were screened for illegal drugs using Abbott FPIA tests and positive cases confirmed using GC-MS. Alcohol was considered positive if the blood alcohol concentration (BAC) was above 0,5‰. The analysed drugs (cannabinoids, cocaine, opiate, methadone and amphetamine) were categorised as positive/negative following the criterions of Iwersen-Bergmann et al. The data were analysed using the software "Stata™ 9.1" and "StatCalc™ 5.4.3". All of the statistical tests were carried out at a level of 5% significance. The study was approved by the ethical board of the University.

RESULTS: 90.9% of the study population were male and 86.6% car drivers. The median age of those tested for alcohol was 36.5 years, for those tested for illegal drugs it was 24.4 years. In 91.2% of the analyses, at least one substance was detected. 91.6% of the alcohol analyses showed positive results. The mean BAC was 1.59‰ (median 1.54‰). The prevalence of alcohol among the analysed samples showed a slight reduction (maximally 2.8%) and exhibited no significant differences regarding year, month, day of the week or sex. The largest amount of analyses positive for alcohol was found in the months from May – August, as well as on weekends (particularly Sundays) and in males. 56.1% of those findings were in the age group 20 to 39 years and the mean age was higher within those who tested positive compared with those who tested negative. In 70.4% of the drug analyses one or more illegal psychoactive drugs, mainly cannabinoids, were detected. The prevalence of illegal psychoactive drugs among the analysed samples did not show any tendency in the study period but exhibited statistically significant differences regarding year, month, sex and cause for requesting the toxicological analysis. The largest amount of positive analyses was found in the months from January – April, as well as on weekends (particularly Sundays) and in younger males. 80.6% of the road users with drug positive results were under 25 years old. In the specimens tested concurrently for alcohol and illegal drugs (n=4.204), the combination of these substances

was present in about 66%. The most frequent combination was alcohol with cannabinoids. Without considering alcohol, the combination of several illegal drugs (up to 4) came in about 1 of 5 specimens tested. The combination of cannabinoids with amphetamines prevailed by far. Nowadays, for each 5 alcohol positive results comes 1 drug detection, whereas if this calculation is performed only with the cases were alcohol and drugs were concurrently tested, the ratio reaches 2/1.

CONCLUSIONS: in the analysed blood samples the prevalence of alcohol showed a marginal decrease over the years 1998 – 2004, whereas the proportion of detection of illegal psychoactive drugs did not show any tendency. Considering the specimens that were tested concurrently on alcohol and drugs, the steadiness of the prevalence of drug detection can not be explained by a stabilization in drug consumption. Although the amount of drug analyses in the period 1998 – 2004 is triplicated, it is necessary to increase the drug test frequency in order to detect a more reliable prevalence of drug influenced drivers.

KEYWORDS: *Forensic Science; Germany; Alcohol; Illicit Drugs; Motor Vehicles; Prevalence*

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