

were participants of the 2007 National Roadside Survey of Alcohol and Drug Use by Drivers.

Results Overall, 53.3% of the cases and 8.9% of the controls had elevated blood alcohol concentrations (BAC \geq 0.01 g/dL), and 6.0% of the cases and 3.0% of the controls tested positive for marijuana. Compared to drivers testing negative for both alcohol and marijuana, the estimated odds ratios of fatal crash involvement were 11.77 [95% confidence interval (CI): 10.78, 12.84] for those testing positive for alcohol and negative for marijuana, 2.16 (95% CI: 1.85, 2.54) for those testing negative for alcohol and positive for marijuana, and 25.46 (95% CI: 21.25, 30.51) for those testing positive for both alcohol and marijuana.

Conclusions Alcohol and marijuana are each associated with a significantly increased risk of fatal crash involvement. When alcohol and marijuana are used together, there exists a positive interaction effect on the risk of fatal crash involvement on the additive and the multiplicative scales.

298 IMPACT OF COLOUR-GRADED PICTOGRAM ON MEDICINE PACKAGES TO CAUTION AGAINST THE RISK OF TRAFFIC CRASH

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10.1136/injuryprev-2016-042156.298

Background In France, a colour-graded pictogram is printed on the outer packaging of medicines according to their effect on driving performance, from level 1 (low risk) to level 3 (high risk). The aim of this study was to assess the impact of labelling benzodiazepines and z-hypnotics with level 2 or 3 pictograms on the risk of road traffic crash.

Methods Data from three French national databases were extracted and matched: the healthcare insurance database, police reports, and the police database of injurious crashes. Drivers involved in an injury crash in France, from July 2005 to December 2011, and identified by their national identifier were included. The study period was divided into 4 periods. The first period corresponded to a period before the colour-graded three-level pictogram was set up. The immediately subsequent period was used to estimate the impact of the introduction of the three-level pictogram. The two following time-periods were defined to assess any relapse in the potential impact of the pictogram. A case-control analysis comparing responsible versus non-responsible drivers was conducted.

Results 142,763 drivers were included. Exposure to benzodiazepine anxiolytics (level 2 or 3) was associated with an increased risk of being responsible for a road traffic crash during the first period of the study (OR = 1.42 [1.24–1.62]). The association disappeared in the second period and became significant again during the third and the fourth period. The risk of being responsible for a crash increased in users of z-hypnotics (level 3) across the four periods (OR from 0.97 [0.81–1.17] to 1.32 [1.10–1.60]).

Conclusions Our results suggest that there has been a change in driving behaviour in benzodiazepine anxiolytic users after the implementation of the graded pictogram. However, there was a relapse immediately after. The increased risk associated with z-hypnotic use despite the presence of the higher level of pictogram calls for further preventive interventions.

299 RISK COMMUNICATION IN MEDICINES AND DRIVING USING PICTOGRAMS

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10.1136/injuryprev-2016-042156.299

Background: Appropriate communication towards patients using driving impairing medicines about risk on fitness to drive can be supported by the use of pictograms. To evaluate and compare the effectiveness of various pictograms and warnings (e.g. a French, a Dutch and a newly developed EU rating model) in communicating risk, several experiments were conducted.

Methods: Structured interviews (experiment 1) and written questionnaires (experiment 2) were used respectively among drivers (n = 270) visiting one out of four community pharmacies in Groningen (n = 4) and patients who were drivers (n = 298) and starting a new treatment with a driving impairing medicine visiting community pharmacies (n = 38) in the Netherlands, to compare various pictograms and warnings.

Results: Compared to general warnings and pictograms, the EU rating model allowed patients to better understand the potential risk estimate when using impairing medicines. Addition of a side-text to the rating model resulted in a significantly higher estimated level of driving risk and a significant increase in intention to change driving behaviour. Age was the strongest predictor influencing participants' preference for pictograms to express a warning message and levels of impairment.

Conclusions: Implementation of the rating model in clinical practice should be considered, but factors such as age and education of patients need attention in designing and implementing new pictograms.

300 UNLOCKING KEYS TO EFFECTIVE IGNITION INTERLOCK PROGRAMS TO REDUCE ALCOHOL IMPAIRED DRIVING

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10.1136/injuryprev-2016-042156.300

Background Ignition interlocks, when installed on vehicles of drivers convicted of alcohol-impaired driving (AID), reduce repeat arrest by 67%. However post-interlock removal, recidivism (AID re-arrest) among previous interlock users equals that of AID-convicted drivers who never used interlocks. Also, the low numbers of offenders installing interlocks limits the impact. Study objectives include determining interlock program characteristics associated with increased interlock use and evaluating including alcohol treatment in the program to reduce post-interlock recidivism.

Methods To determine effective program characteristics, eight interlock program keys (e.g. requirement to instal interlocks) were identified and each rated on 1–5 scale for 28 U.S. state interlock programs. Correlation analysis between rate of interlocks in use/10,000 population, and program key rating was conducted. To evaluate treatment in the one state with a treatment program, survival analysis using Cox regression proportional hazards model was performed with post-interlock recidivism as the terminal event. The treatment group (n = 640) were offenders with three or more violations (two alcohol-positive start attempts