Driving Under the Influence of Non-Alcohol Drugs — An Update Part I: Epidemiological Studies

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ABSTRACT: Epidemiological studies of the association between drug use and involvement in road traffic crashes (RTCs) published from January 1998 to February 2015 have been reviewed. Cohort and population studies compared RTC involvement among drug users and non–drug users, case-control studies compared drug use among RTC-involved and non–RTC-involved drivers, and responsibility studies and case-crossover studies were performed for RTC-involved drivers. Difficulties associated with the types of studies are discussed with a special focus on case-control studies. Statistically significant associations between drug use and RTC involvement were found for benzodiazepines and z-hypnotics in 25 out of 28 studies, for cannabis in 23 out of 36 studies, for opioids in 17 out of 25 studies, for amphetamines in 8 out of 10 studies, for cocaine in 5 out of 9 studies, and for antidepressants in 9 out of 13 studies. It was a general trend among studies that did not report significant associations between the use of these drugs and increased RTC risk that they often had either poor statistical power or poor study design compared to studies that found an association. Simultaneous use of two or more psychoactive drugs was associated with higher RTC risk. Studies on the combination of alcohol and drugs have not been reviewed in this article even though this combination is known to be associated with the highest RTC risk.

KEYWORDS: Amphetamines, antidepressants, benzodiazepines, cannabis, cocaine, drugged driving, DUID, epidemiology, hypnotics, opioids, road traffic crashes (RTCs).

INTRODUCTION

A review article on the effect of drug use on road traffic safety was published in this journal in 2000 [90]. The article included experimental and epidemiological studies published before 1998 for the following drug groups: benzodiazepines and related drugs, cannabis, opioids, amphetamine and related drugs, antihistamines, and antidepressants. Many investigations have been performed since then. In this article, epidemiological studies on drugs and traffic safety published after 1998 are reviewed. An update of experimental studies will be published in a forthcoming issue of this journal together with a summary of the combined knowledge from epidemiological and experimental studies.

Experimental studies can be used to determine whether a drug may impair driving-related functions and are most commonly performed for medicinal drugs using healthy individuals taking relatively small drug doses. In many countries it is impossible to perform experimental studies of illicit drugs in humans for ethical reasons. In countries where such studies are allowed, the doses given and drug exposure times are often lower than those used by problematic drug users and may therefore not reflect the actual risks in road traffic.

The resulting effects of drug use on traffic safety are a function of the degree to which the drugs are used, the levels and manners in which they are used, and the populations that are using them [86]. Therefore, epidemiological studies are needed to determine the actual consequences of drug use on road traffic safety.

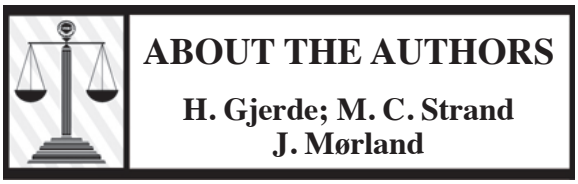
An important advantage with epidemiological studies is that they may be used to determine the impact of drug use in the general population of drivers, which includes users of illicit drugs, patients taking medicinal drugs for treatment of illness or relief from symptoms, and drivers using the same type of drugs for recreational purposes or because of drug addiction. In the latter case, the taken dose may be substantially higher than doses taken by patients for therapeutic purposes. Medicinal drugs that are used for the treatment of severe pain, anxiety, insomnia, narcolepsy, or hyperactivity are among those most frequently used for nontherapeutic purposes.

This review is primarily based on articles found by searching the major scientific literature databases. We have only included studies published in English.

I. METHODOLOGICAL ISSUES

A. Challenges and Difficulties

There are four main types of epidemiological studies on the incidence and consequences of drug-impaired driving in various driving populations, primarily those involved in road traffic crashes (RTCs): (a) cross-sectional, descriptive studies on the prevalence of drug use; (b) cohort and population studies on RTC involvement among drug users compared to non-drug users; (c) case-control studies



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