Rearrest rates among Norwegian drugged drivers compared with drunken drivers

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1. Introduction

Driving under the influence of alcohol is regarded as one of the most important risk factors with respect to road traffic safety (Borkenstein et al., 1974; Simpson, 1987). In order to reduce the occurrence of drunken driving and prevent accidents, many countries have passed legislation, lowered their legal limits for drunken driving, introduced alcohol roadside controls and sanctions, and carried out information campaigns on the accident risk (McLean et al., 1995; Bailey, 1995; Norstrøm and Laurell, 1997). Nevertheless, drunken driving frequently occurs, and many drivers are rearrested for the same type of offence (Gjerde and Mørland, 1990; Yu and Williford, 1995; Pikkarainen et al., 1995; Christophersen et al., 1996; Skurtveit et al., 1998). It has also been reported that heavy drinkers who show alcohol-related problems are over-represented among rearrested drunken drivers (Gjerde et al., 1986; Vingilis, 2000). Rehabilitation programmes have therefore been introduced in several countries, including medical follow-up to prove alcohol abstinence before a driving licence may be renewed (Laurell, 1995; Nickel et al., 1995; Wells-Parker et al., 1995). During the last years, considerable interest has developed in driving under the influence of drugs other than alcohol as a threat to road traffic safety (de Gier 1995, 1998). Several studies have documented increased accident risks when illegal and/or prescribed psychoactive drugs are combined with driving (Honkanen et al., 1980; Christophersen et al., 1995; Neutel, 1995; Mørland, 2000a; Drummer, 2001). Increased drugged driving has been reported from several countries (Christophersen et al., 1990; Lillsunde et al., 1995; Christophersen and Mørland, 1997; Seymour and Olver, 1999). In Norway, the number of drivers apprehended per year on suspicion of being under the influence of drugs, more than doubled from 1983 (n = 800) to 1990 (n = 2050), and again from 1990 to 1999 (n = 4800) (Christophersen, 2000). During the same time period, the number of drunken drivers apprehended decreased from approxi-
mately 10 500 in the early 1980s to 4950 in 1999. These figures demonstrate that the rate of detection of drunken driving is currently low in Norway, whereas the prevalence of detected drugged driving is higher compared with other countries (Christophersen and Morland, 1997; Christophersen et al., 1999; Morland, 2000b). Based on information from the police protocol completed at the time of biological sampling, the main reasons for apprehension have been due to accidents, reckless or dangerous driving.

Drugged drivers who are apprehended in Norway are frequently multi-drug users, i.e. one or more illegal drugs are detected, generally combined with prescribed psychoactive drugs detected at blood concentrations representing doses above recommended therapeutic levels (Christophersen and Morland, 1997; Christophersen, 2000). However, it is not known if the drugs have been prescribed by one or several doctors or bought illegally.

According to the Norwegian Road Traffic Act, the penalties for driving under the influence of alcohol (blood alcohol concentration (BAC) limit: 0.05%) or drugs are fines and prison sentences, depending on the degree of influence. In addition, the driving licence is normally suspended for 2 years. No legal limits have been established for drugs other than alcohol and each case has to be evaluated individually with regard to possible impairment (Christophersen and Morland, 1997). If drugs are detected in addition to alcohol, even with BAC above the legal limit, a fine or prison sentence may be increased, based on the total degree of influence by alcohol and/or drugs.

Repeated offences by drugged drivers have gained less attention than is the case for drunken driving. The main reason is probably that most countries have not carried out regular controls of drugged driving, so that few cases have been available to be used in studies of repeated offences. However, previous studies from Norway on selected groups of drugged drivers followed for short periods of time showed a high rearrest rate (Gjerde et al., 1988; Christophersen et al., 1997). There are no rehabilitation programmes for drugged drivers as there are for rearrested drunken drivers.

The purpose of the present investigation was to follow the rearrest rate among drugged drivers over a longer period of time, and to investigate whether the probability of becoming a recidivist was connected to specific characteristics of the drivers or drugs detected on selection, e.g. illegal drugs versus psychoactive prescribed drug users, single drug versus multi-drug users. In order to compare the rearrest rate among drugged drivers and a reference group, a representative group of drunken drivers was selected and followed during the same period of time and rearrests were recorded. An investigation of this kind, which could document the frequency of rearrest among drugged drivers and any specific characteristics connected to the recidivist drivers on selection, might give important information on the need for rehabilitation and which groups of drugged drivers should be given priority in such programmes.

2. Materials and methods

The National Institute of Forensic Toxicology (NIFT) receives blood samples from all drivers suspected by the Norwegian police of driving under the influence of alcohol or drugs. The procedures established in Norway for suspected drunken and drugged driving cases, from the time of apprehension by the police to the time when a case ends up in court, have earlier been published (Christophersen and Morland, 1997). The cases included in this study were selected from the data recorded from 1984 at NIFT, which has information from all alcohol and drug traffic cases from the whole country, in which the police asked for blood drug analyses. Two different selection criteria had to be satisfied for a person to be recorded as a drugged driver in the present study: (1) the primary reason for apprehension by the police was a suspicion of drugged driving; thus, a clinical evaluation was performed by a physician at the time of blood and urine sampling (in contrast to cases where drunken driving only was suspected and no clinical evaluation or urine sample was required). The main reasons for suspecting drug use were connected to the discovery of syringes, pills or other equipment indicating drug use in the car, the results of a preliminary investigation by the police at the scene (pupils, pulse rate, other signs connected to drug use) or knowledge about previous drug use or drugged driving by the suspect. (2) Detection of drugs in blood samples from the apprehended driver, either alone or in combination with alcohol. Cases involving alcohol above the legal limit of 0.05% only, but with no drugs detected, were not included in the study, even if the police suspected drugs on apprehension.

The group of drugged driving cases (using the selection criteria described above) and a reference group of drunken drivers were selected from NIFT’s data record for this study as described below.

2.1. Drugged drivers

The group of drugged drivers was selected among those apprehended by the police during 1992 (n = 2718) and thus recorded routinely as the daily cases at NIFT. All blood samples from the suspected drugged drivers with a BAC below 0.15% (n = 2372) were analysed for amphetamines, benzodiazepines (BZD), opiates, tetrahydrocannabinol (THC) and cocaine (Christo-
Drug analyses were not performed in blood samples from drivers whose BACs were above 0.15%, because these drivers were sentenced to prison in any case under the Norwegian Road Traffic Act, regardless of whether or not drugs were detected in addition to a BAC above 0.15%. Moreover, in another study, drugs were detected in very few cases where the BAC was above this level (about 5% of the total number of drug-positive cases, Mørland et al., 1995).

The drugs most frequently detected in the cases selected during 1992 and subjected to the standard drug analytical programme (Christophersen and Mørland, 1997) were THC \((n = 759)\), diazepam \((n = 590)\), amphetamine \((n = 349)\), flunitrazepam \((n = 207)\) and morphine \((n = 134)\). One or more drugs were detected in 1415 blood samples (60% of the cases where the primary suspicion was connected to drugs) representing 1230 different subjects, as some of the drivers were arrested several times during the year of selection. Only drivers who could be traced by personal identity numbers or other reliable data were selected for further studies, excluding 128 subjects from the group first selected.

Thus, 1102 drugged drivers were included for this study, median age 28 years, including 13.5% female \((n = 149)\) and 86.5% \((n = 953)\) male drivers. For 25% \((n = 278)\) of these drivers, BACs above the legal limit of 0.05% were detected in combination with one or more drugs.

For the whole group of selected drivers, the distribution of age, sex, drug pattern detected at selection, in addition to previous apprehensions back to 1984 for impaired driving due to alcohol or drugs, are presented in Fig. 1 (upper part). For drivers apprehended more than once during the selection year, characteristics on the first apprehension in 1992 were used for further comparisons. The types of drugs detected at first offences during the period from 1984 to 1992 were recorded.

The group of selected drivers \((n = 1102)\) were followed prospectively during the 7 subsequent years from 1992 to 1998, to record rearrests for drunken or drugged driving. A selected drugged driver was registered as a recidivist if NIFT’s data record showed a new sample requested after a suspected impaired driving episode and if the sample contained alcohol and/or drugs. From 1996 onwards, the Police data records from evidential breath analyses (introduced for the first time this year) were also included for the recording of rearrests. The Norwegian Data Inspectorate approved the combination of two different data records.

2.2. Reference group (drunken drivers)

To allow a comparison of rearrests among drugged and drunken drivers, all drunken drivers arrested during 1992 \((n = 6876)\) who were primarily suspected of being under the influence of alcohol only, and who were found to have a BAC in the interval 0.16–0.19%, were selected \((n = 850)\). The BAC interval selected represented the mean segment of BACs for Norwegian drunken drivers (Skurtveit et al., 1998). The prevalence of rearrests was followed for the same time period as for the group of drugged drivers selected in 1992. The group of drunken drivers was also traced both retrospectively and prospectively for 15 years (1984–1998) for a comparison of the recidivism rates of the two groups of drivers.

2.3. Statistical procedures

Statistical package SPSS 10.0 for Windows was used for statistical analyses. Logistic regression was used to estimate odds ratio (OR) and confidence interval (CI) for selected drugged drivers to be recorded as recidivists and to evaluate the multivariate relations for various categories of covariates (Fig. 1).

![Fig. 1. Characteristics of drivers (age and sex) and drugs detected on selection, e.g. illegal drugs or psychoactive prescribed drugs, single drug users or multi-drug users on selection in 1992. The numbers of different groups of drivers rearrested during 1992–1998 are shown.](image-url)
Fig. 2. The most frequently detected drugs on first arrest among selected drivers from 1992, who had previously been arrested \((n = 546)\) during the period 1984–1992.

3. Results

3.1. Subsequent rearrests among drugged drivers

Overall, 57\% \((n = 629)\) of the drugged drivers reappeared in our data system twice or more in the period 1992–1998, due to arrests for driving under the influence of drugs, drugs combined with alcohol or alcohol alone. The recidivist drivers accounted for 2385 rearrests, or a mean of four rearrests per driver during a total period of 7 years. The frequency of recidivism was higher among male \((61\%, n = 577)\) than female drivers \((35\%, n = 52)\). Drivers with multi-drug detection at selection showed a higher rearrest rate than those where only one drug was detected at selection \((62\%, n = 529\) vs. \(41\%, n = 100)\), retrospectively). The rearrest rate was higher for those with previous apprehensions on the grounds of driving under the influence of alcohol or drugs \((73\%, n = 396)\) than for those with no previous arrests \((42\%, n = 233)\). Drivers with age below 36 years at selection, showed a higher rearrest rate \((60\%, n = 541)\) than older drivers \((44\%, n = 88)\). The results are summarised in Fig. 1 (lower part). The rearrest rate among the group of drivers with drugs combined with alcohol detected above the legal limit of 0.05%, was 62\% \((n = 173)\), the same level as for the whole group of the multi-drug using drivers.

Table 1

<table>
<thead>
<tr>
<th>Covariate</th>
<th>OR</th>
<th>CI</th>
<th>P</th>
<th>Reference category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>0.47</td>
<td>0.32–0.69</td>
<td>0.000</td>
<td>Male</td>
</tr>
<tr>
<td>Age</td>
<td>0.55</td>
<td>0.39–0.78</td>
<td>0.001</td>
<td>15–35 years</td>
</tr>
<tr>
<td>Driving under influence before 1992</td>
<td>2.98</td>
<td>2.29–3.88</td>
<td>0.000</td>
<td>No</td>
</tr>
<tr>
<td>Multi drug use at selection</td>
<td>2.06</td>
<td>1.52–2.81</td>
<td>0.000</td>
<td>Use of single drugs</td>
</tr>
<tr>
<td>Illegal drug use at selection</td>
<td>1.21</td>
<td>0.88–1.66</td>
<td>0.237</td>
<td>Use of legal drug</td>
</tr>
</tbody>
</table>

All covariates are characteristics of drivers or findings in their blood samples at selection in 1992. Overall percentage = 66.3.

In the selected group of drugged drivers with previous arrests during the period back to 1984, 78\% \((n = 428)\) had a BAC above the legal limit \((0.05\%)\) the first time they were arrested. Other drugs detected on first arrest were THC \((48\%, n = 264)\), diazepam \((34\%, n = 183)\), amphetamine \((17\%, n = 95)\), flunitrazepam \((16\%, n = 86)\) and morphine \((8\%, n = 44)\) (Fig. 2). Table 1 shows the ORs for new arrests among the selected group of drugged drivers during the period 1992–1998, calculated with the logistic regression model. Factors showing a statistically significant parameter response relationship with becoming a recidivist were sex, age, multi-drug/single drug detection on selection and previous apprehensions for impaired driving. Younger (below 36 years of age) multi-drug using male drivers with previous apprehensions, were associated with a higher probability of recidivism than the other selected drugged drivers (females, single drug users, no previous arrest before selection year). No statistically significant parameter response relationship with illegal/legal drug detection on selection was recorded. The highest ORs were found for factors related to previous apprehensions for impaired driving due to alcohol or drugs (Fig. 1).

The timing of rearrests is illustrated in Fig. 3, which shows the percentage of the selected drugged drivers who became recidivists (cumulative recidivism rate curve) during the period 1992–1998. The probability of rearrest was highest during the selection year (21\%) and...
the following 3 years, when a further 13, 7 and 6%, respectively, of the drivers were recorded as recidivists. Three years after the selection year (end of 1995), 47% of the drivers had reappeared in the data record at NIFT due to drugged or drunken driving. During the 3 following years (1996–1998), a further 10% were rearrested (Fig. 3), indicating that relatively few of those who ‘survived’ the first period from 1992 to1995 were rearrested during the subsequent 3 years.

3.2. Comparison of drunken and drugged drivers

The rearrest rate for drunken drivers selected in 1992 with BACs in the range 0.16–0.19% was 28% (n = 238), or less than half of the rate for drugged drivers (57%) followed for the same 7-year period (Fig. 4). Overall, the rearrested drunken drivers (n = 238) accounted for 765 arrests, with a mean of three rearrests per driver, somewhat lower than for the drugged drivers, who had a mean of four rearrests during the same time period.

When the drunken drivers were traced both retrospectively and prospectively for 15 years (1984–1998), a total of 40% (n = 344) were recorded as recidivists. This is about half the rearrest rate for the drugged drivers (71%) who were followed for the same 15-year period (1984–1998) (Fig. 4).

4. Discussion

In the present study we found that the rearrest rate among drugged drivers was approximately twice that of a reference group of drunken drivers who were followed for the same time period (Fig. 4). The most important risk factors for recidivism among drugged drivers were previous arrests and multi-drug use. Younger male drivers (below 36 years of age) showed a higher risk of become recidivists than older and female drivers.

4.1. Drugged driving in Norway and changes in patterns of drug use during the 1990s

During the follow up period of this study (1992–1998), there were no significant changes in the routines for dealing with traffic cases at NIFT, including the standard analytical programme used to reveal drugs in blood samples from apprehended drivers. One factor that might have contributed to the increased number of detected drugged driving cases during these years, could be a growing attention by the police, who have received better training in these matters. However, the increase in drugged driving cases can be confirmed by an increase in the occurrence of drug seizures in Norway during the same time period, as documented by the customs and police (Kripos 2000), statistics on drug use (Alcohol and Drugs in Norway, 1998) and a report from the Norwegian Government describing changes in patterns of drug use during the 1990s (Narkotikaproblemene i Norge, 2000). As documented by these reports, drug seizures and use have increased steadily during the last 10 years. There has been constant increase in the use of harder illegal drugs (e.g. heroin, amphetamines) as well as a spread from the larger Norwegian towns to rural districts. Drug prices on the black market have decreased steadily during the same period (Narkotikaproblemene i Norge, 2000). This situation is likely to be reflected in more frequent drug use combined with driving. An increase in drugged driving has also been documented in other countries (Lillsunde et al. 1995; Seymour and Oliver, 1999).

4.2. Important risk factors for recidivism

In the present study, we found that previous arrests for impaired driving and multi-drug use combined with driving were both important risk factors for rearrest for the same offence among drugged drivers. Sex and age were also registered as significant risk factors. The rearrest rate was higher for drugged drivers with one or more arrests prior to the selection time than for those without previous arrests. A higher probability of arrest for recidivist drunken drivers than for first offenders has also been described previously (Skurtveit et al., 1998). There may be several reasons for the higher probability of rearrest for drivers with earlier arrests. The most important may be that those who are already repeat offenders constitute a group of subjects who show reckless high-risk behaviour (Vingilis, 2000). Similar high risk behaviour has been documented among arrested drunken drivers where the majority had a high-risk lifestyle (Vingilis, 2000). We have previously found that 30% of the drugged drivers had also been apprehended for violent behaviour (unpublished results).

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Fig. 4. The frequency of rearrested among drugged drivers (n = 1102) compared with drunken drivers (n = 850), all selected from 1992 and followed both retrospectively and prospectively for 15 years (1984–1998) and prospectively for 7 years (1992–1998).
Several earlier studies have documented that females constitute a minority of the drivers suspected of driving under the influence of drugs or alcohol (Christophersen et al., 1990; Skurtveit et al., 1995). This study has also shown that the rearrest rate for female drugged drivers was significantly lower than for male drivers. Earlier studies have also shown the same pattern for drunken drivers. (Gjerde and Mørland, 1990; Skurtveit et al., 1998). These findings may indicate an important sex difference in attitudes to repeated impaired driving. A closer look at factors behind this difference might give a clue to factors essential for the prevention of repeated impaired driving.

The frequent detection of illegal and multi-drug use, often combined with psychoactive drugs in excess of therapeutic levels (Christophersen, 2000), indicate an abnormal attitude to drug use combined with driving among this group of drivers. Our study also shows that single drug users were less likely to be rearrested than multi-drug users. Illegal drug use was not shown to be associated with a significantly higher risk of rearrest than the use of psychoactive prescribed drugs only. However, drivers using psychoactive prescribed drugs only, and particularly those using only one medicinal drug, seemed to be relatively rarely represented in the group of suspected drugged drivers (Christophersen, 2000).

4.3. A comparison of recidivism among drugged and drunken drivers

The results of our study showed a high rate of rearrest for drugged drivers followed prospectively for 7 years (57%), which increased when they were followed both retrospectively and prospectively (71%) for a total period of 15 years (1984–1998). For both time periods, the frequency of recidivism was about twice that found for a corresponding selected reference group of drunken drivers (Fig. 4). The rearrest rate among the group of selected drivers with both alcohol (BACs above the legal limit) and drugs detected, were more than twice compared with those with alcohol only detected when followed for the same time period (62 vs. 28%).

The cumulative recidivism plot illustrating the occurrence of rearrests after the selection year showed that the majority of the drugged drivers were rearrested during the year when they were selected (1992) and during the subsequent 3 years (1993–1995). Relatively few ‘new’ rearrested drivers were recorded during the next 3-year period (a total of 10% during the period 1996–1998). The cumulative recidivism rate curve was similar to what has previously been documented for drunken drivers, except that the rearrest rate was higher for drugged drivers (Skurtveit et al., 1998).

We found that for drugged drivers with earlier arrests who were followed retrospectively for 7 years, there was a high probability that the first arrest was due to alcohol (78%). However, other drugs may have been overlooked during this period, since the police more often suspected alcohol only among apprehended drivers during the 1980s. Another study in which drivers detected as amphetamine users in 1995 were traced retrospectively back to 1984, found that they had frequently been detected with BACs above the legal limit on first arrest in the 1980s. For those who were arrested for the first time during the 1990s, other drugs were more frequently detected on their first arrest (Skurtveit et al., 1999). Our results thus may indicate that people first arrested as drunken drivers in the 1980s and early 1990s are contributing to the increasing problem of driving under the influence of drugs other than alcohol, as they frequently change to drugs other than alcohol combined with driving. During the last 10 years, the number of drunken drivers in Norway has decreased, while the drugged driving cases have increased. However, the total number of arrested drivers due to alcohol or drugs has not changed significantly during this time period (Christophersen, 2000).

4.4. Rehabilitation programme for recidivist drugged drivers

The high rate of rearrests among drugged drivers, who are frequently multi-drug users, indicates that this group of drug users frequently drive, probably often without a valid driving licence. This statement is supported by an earlier study showing that approximately 800 drugged drivers were sentenced in 1992 under the Road Traffic Act (Mørland and Christophersen, 1999). This suggests that a large proportion of the drugged drivers selected for this study have probably been sentenced and lost their driving licences for at least 2 years after the year of selection (Mørland and Christophersen, 1999). The high frequency of rearrest shortly after initial selection indicates that many of these people continued to drive without licences, showing that a follow-up system or treatment programmes are necessary. The increasing occurrence of drugged drivers, who appear to show a rearrest rate at least twice that of drunken drivers, also shows that society needs to find a response in addition to fines, imprisonment and the withdrawal of the offender’s driving licence. Programmes similar to those now offered to selected recidivist drunken drivers in Norway are needed. They should preferably be started as soon as possible after the first arrest, as more than 30% of the study group were rearrested during the year of selection and the following year. Special attention should be paid to young men with previous arrests and multi-drug users, since these are risk factors for rearrest. A rehabilitation programme should include some sort of treatment programme combined with control of drug abuse before
the driving licence can be renewed. In some countries, rehabilitation programmes for drugged drivers have been established (Krohn and Brisch, 1997), but as yet their effects have not been evaluated. It should also be kept in mind that many of these drivers contribute to the rising threat to traffic safety, as documented by police protocols showing that the majority of the drivers were arrested due to accidents or reckless or dangerous driving. The increasing risk of accidents combined with drug use has also been confirmed by several other studies (Honkanen et al., 1980; Neutel, 1995; Christophersen et al., 1995; Drummer, 2001). An important goal would be to prevent these subjects from combining driving with drug use, to avoid the possibility of accidents.

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Central Mobile Police Force, Norway.

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