The Incidence of Drink and Drug Driving in the UK – A Roadside Survey in Glasgow

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Background
In recent years, the number of drivers who drive while under the influence of drugs has increased. Previous studies looking at the presence of drugs in the specimens obtained from road traffic accident fatalities have shown that a significant proportion (24%) of fatally injured drivers have drugs in their body (1).

This paper reports on a study that formed part of a Europe-wide investigation of the impact drugs, medications and medical conditions have on road safety (the IMMORTAL project) (Impaired Motorists, Methods of Roadside Testing and Assessment for Licensing). This larger research programme is investigating the accident risk associated with different forms of driver impairment and the implication for licensing assessment and roadside impairment testing (including drug screening).

The study described in this paper involved a common methodology in three participating European countries: Holland, Norway and the United Kingdom. The UK part of the study, which was funded jointly by the European Commission and the Department for Transport, was carried out in Glasgow, Scotland.

Objectives
The present study aimed to examine whether drivers using one or more of the eight drug groups being assessed have a higher accident risk than drivers not using these drugs, and to as far as possible quantify this risk.

The eight drug groups included were: benzodiazepines, opiates, methadone, amphetamines, ecstasy, cannabis, cocaine and alcohol.

The hypothesis was that, if the presence of any of the drugs being considered in the study impairs driving this would increase accident risk so that the incidence of a drug/drugs in the injured sample would be higher than in the roadside control sample. The ratio of the incidence of each drug: injury sample incidence/roadside sample incidence gives the relative injury risk for each drug.

Methodology
The common methodology adopted across the 3 countries was to carry out a case/control study, where the prevalence of the substances among injured drivers (a hospital sample) and normal drivers (a roadside sample) would be compared, and the
relative risk of each substance and some combinations of substances would be estimated.

The roadside control samples would be collected from non-accident involved drivers at sites within the catchment area of the hospitals and at the same times of day as the people in the accident sample had their accidents.

In partner countries case samples were collected from both fatally and non-fatally injured drivers. In Scotland, although considerable efforts were made to obtain ethical approval to get hospital samples from injured drivers this proved not to be possible. This difficulty surrounded special legal issues in Scotland in obtaining body fluid samples from injured drivers who may be impaired. The case samples were therefore limited to those obtained from fatalities. Because of the relatively low number of fatalities in the Glasgow area, comparable data were collected over a 3 – 4 year period.

Roadside control samples (1250) were collected from non-accident involved drivers at sites within the Central Glasgow area at sites with a high injury accident rate. These were principally the main radial trunk routes serving Glasgow city centre.

Sampling of drivers at the roadside took place as far as possible over a 24 hour period. In order to be compatible with the methodology of other IMMORTAL partners in Holland and Norway, sampling was divided into 4 six-hour periods for comparative purposes, and was scheduled for a period of 12 months from July 2003 to June 2004.

It is essential that the safety of both public and police (who are required to stop traffic) are not compromised. Once the specific sampling sites had been chosen, interviews were set up in a lay by, or a coned-off area. Two officers were present at all times; one police officer to stop traffic and the second to make the initial contact with drivers.

For a scientifically valid sample, as far as possible, drivers of cars and vans were stopped at random and not stopped on the basis of any preconception of impairment e.g. that drivers of a particular age or sex or those driving a certain type of vehicle were more likely to be impaired. The procedure adopted was that after a test was completed and the vehicle had cleared the site, the officer in charge would stop the next approaching vehicle. This meant that drivers were not queuing up to be interviewed and that interviewers did not have to wait for e.g. the 12th vehicle to come along to be selected.

If informed consent was obtained from the driver for participation in the study, the police officer would pass the driver over directly to the interviewer for conduct of a saliva test. If the driver declined to cooperate, the police officer would request a reason for non cooperation and the driver would then be allowed to proceed without hindrance. The reason for refusal, together with age estimate and sex of the driver who declined, would be passed to the interviewer so that a complete record (as much as possible) of all drivers’ age and sex was obtained.

In order to allow a proper estimate of any increased risk associated with driver’s consuming drugs it was of paramount importance to allow the random sample of drivers to include those whose driving might be impaired by drugs or alcohol. However, where someone was suspected by the police of being impaired to a degree that they were
breaking the law or posed a road safety risk, the police would call another unit to remove
the suspect from the scene for further enquiry.

Results from blood samples from drivers taken away by the police for further testing
were sent to TRL in addition to the results from the roadside saliva samples.

For ordinary drivers who did not appear to be impaired, the interviewer asked the driver
to provide a specimen of saliva. This was voluntary. The ‘Omnisal’ saliva testing
system was used and the sample was labelled and transferred to a cool box for onward
transmission and analysis by Glasgow University. In addition, an individual test record
was completed of the driver’s age and sex, together with the time, date and location at
which the sample was obtained.

Only the incidence of the drug groups would be assessed, not their concentration.
However, concentrations would need to be above a minimum cut-off level to
demonstrate the presence of a drug.

At the conclusion of each saliva test the driver was given a questionnaire asking for
details of alcohol consumption, driving habits and any use of drugs or medicines. A pre-
paid envelope was included for return to TRL. In addition, the driver was given an
explanatory letter outlining the purpose of the evaluation and thanking them for their
participation.

Questionnaires, test records and saliva samples were all uniquely numbered for later
analysis and comparison of results. Test records were batched and forwarded
immediately to TRL. The Department of Forensic Toxicology, Glasgow University
analysed the saliva samples from both the roadside and fatal accident sources. This
consisted of initial screening followed by full confirmatory GC/MS analysis of all positive
samples. In this process, if a saliva sample proved positive in an initial screening test for
any of the drug groups listed in the objectives, further analysis would be carried out to
identify the individual drugs found and their concentration.

Results and analysis
At the time of writing (March 2004), 784 roadside interviews and saliva tests had been
conducted and 351 driver questionnaires had been returned to TRL.

Chemical analysis had been conducted on 386 of these saliva samples and the results
are shown in Tables 1. None of the driver questionnaires had been analysed at this
stage.

The table lists the eight key drug groups identified in the IMMORTAL project as being
likely to impair driver performance and thereby the risk of an accident. Table 1 also
includes the cut off level for each drug group. This is the level above which there is a
very high probability that the drug group is present (typically 95 – 99%). In analytical
chemistry all cut-off levels are essentially a compromise. If the level is set too low, the
screening test may give a ‘false’ positive reading, indicating that the drug is present
when it is not; if the level is set too high the test may fail to detect the drug even if it is
present.
The cut-off levels given in the table are those used in the previous TRL study of drug incidence in fatal road casualties (1). At the time of writing the IMMORTAL consortium were still discussing cut-off levels. However, the levels listed here are fully compatible with those routinely used for forensic and commercial workplace drug screening.

Table 1. Key Drugs detected in the roadside driver sample

<table>
<thead>
<tr>
<th>Substance</th>
<th>Cut Level Positive (ng/ml)</th>
<th>Off for No. Detected N=386</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzodiazepines</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>500</td>
<td>0</td>
</tr>
<tr>
<td>Methadone</td>
<td>300</td>
<td>1</td>
</tr>
<tr>
<td>Cocaine</td>
<td>150</td>
<td>4</td>
</tr>
<tr>
<td>Opiates</td>
<td>300</td>
<td>5</td>
</tr>
<tr>
<td>Ecstasy (MDMA)</td>
<td>500</td>
<td>6</td>
</tr>
<tr>
<td>Cannabis (THC)</td>
<td>50</td>
<td>2*</td>
</tr>
</tbody>
</table>

* n=65

Table 1 shows that a total of 18 drugs were detected in the sample of 386 drivers; an incidence of 4.7 per cent.

Discussion
At the time of writing only 30% of the total expected sample of 1250 had been analysed; for cannabis only 65 cases had been analysed (5%). Nevertheless, the incidence of 4.7 per cent in the roadside sample, of those analysed, is considerably lower than the incidence of drugs found in drivers in the recent road fatality study (1) which was 22.9 percent.

No clear conclusions can be drawn from these results at this stage of the study, but they are indicative of a substantially lower drug incidence in a random sample of non-accident involved drivers, compared to an accident involved sample. The distribution of drugs found at this stage appears to be reasonably representative of what might be expected from admitted illicit drug use in the general population (2) as reported in the British Crime Survey.

Of the 5 opiates cases, 3 were known to be cases of codeine rather than heroin. At this stage of the study use of illicit drugs in the roadside sample seems to be rather low. Ecstasy was the most common illicit drug detected followed by cocaine and cannabis. However, since only 65 cases had been analysed for cannabis as opposed to 386, for the other drugs, it is likely that when more analysis has been carried out cannabis will turn out to be the drug most frequently found. It is normally by far the most frequently
found drug in epidemiological studies of drug use by drivers. It is also the most commonly used illicit drug in the general population.

**Next Steps**
By the time of ICADTS 2004 it is hoped that it will be possible to present a full and descriptive account of the Glasgow roadside study including an analysis of driver’s questionnaires. This will allow a comparison with admitted drug use to be made together with characteristics of driver’s age, sex and social status.

In addition, data from fatal accidents in Glasgow involving drugs should allow a preliminary risk to be associated with particular drug groups, where there is a sufficient sample. These results will be taken together with the results from IMMORTAL partners in the Netherlands and Norway, where comparisons of the incidence of drugs in injured hospital attendees and uninjured drivers are being made. This should allow an identification of drugs which may present an increased risk of accident involvement. This information may assist in deciding on a programme of appropriate education and countermeasures.

**References**