Summary of TRL Report TRL543 **2002**

THE INFLUENCE OF CANNABIS AND ALCOHOL ON DRIVING

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The second phase of a two-phase study into the impairment effects of cannabis on driving is reported here. This phase concerns the effects of cannabis taken in conjunction with alcohol. The first phase, into the effects of cannabis taken alone, has already been reported.

Introduction

The most recent of TRL's major studies investigating the incidence of alcohol and drugs in road accident fatalities has shown a large increase in the incidence of drugs present in fatal casualties (drivers, riders, passengers and pedestrians). Among all road users illicit drugs were present in 18% of fatalities. These figures represent a six-fold increase in the detected incidence of illicit drugs present in fatalities since the previous, similar, study 12 years earlier. In the most recent research cannabis constituted around two thirds of the illegal drugs found in fatalities. In the study of fatalities referred to above, 24% of the drivers who had consumed cannabis were also over the drink/drive limit, and a further 16% had consumed some alcohol but were below the legal limit.

Anecdotal evidence suggests that regular cannabis users often consume alcohol during a cannabis-smoking session. The amount of alcohol they consume is usually below the legal limit, and hence they may believe that their driving is unaffected by the alcohol. It is therefore important to establish the degree of impairment caused by such a dose of alcohol in combination with a typical cannabis dose. In 1999, the (now) DfT (Department for Transport), commissioned a review of the latest evidence of the impairment effects of cannabis. The report of that review provided an overview of the effects of cannabis on driving and accident risk and identified areas where current knowledge was deemed to be insufficient to guide road safety policy.

This raised important questions, which have now been addressed by a research project carried out by TRL for Road Safety Division, DfT, to investigate the degree to which cannabis impairs psychomotor and cognitive skills relevant to the driving task.

Background

It is well known that cannabis is often taken in conjunction with alcohol. Previous comparative studies have generally compared the effects of high doses of alcohol with those of medium-to-low doses of the active ingredient in cannabis, Δ^9-THC. It has been well established that alcohol has severe impairing effects at high blood alcohol concentrations whilst performance decrements have been demonstrated at concentrations as low as 30mg/100ml. It has also been shown that approximately 10 mg Δ^9-THC is required to induce a close to 'normal use' level of cannabis intoxication.

Previous studies have shown that simulated and actual driving and divided-attention tasks are severely affected by alcohol. Simple vigilance tasks are not so much affected and tasks such as tracking and reaction-time tasks are only affected at relatively high blood alcohol levels. Alcohol may, therefore, be seen as first disturbing the higher cognitive processes. Such disturbances are greater than the losses in psychomotor skills and simple attentional processes. However, it is well recognised that at alcohol levels of 80mg/100ml (the UK legal limit), or more, impairment effects are significantly increased.

In contrast, previous studies with cannabis show that it first seems to affect all tasks requiring psychomotor skills and continuous attention. Thus, tracking tasks, which are very sensitive to short term changes in attention, are very sensitive to cannabis impairment. On the other hand, multi-task processes and higher cognitive functions are less time-critical: a short attention lapse can be compensated for by increased activity later.

In the case of the driving task, this may explain the frequently repeated observation that drivers under the influence of cannabis drive more slowly, presumably to lower the difficulty of the driving task and its time-critical aspects in an attempt to compensate for the impairment of psychomotor skills and losses in continuous attention.

Conclusions

This research has:

- demonstrated the practicability of assessing the effects of cannabis and alcohol on driving performance in controlled experimental clinical trials;
- confirmed the results from previous studies that drivers under the influence of cannabis are aware of their impairment, attempt to compensate for their impairment by driving more cautiously, but are unable to compensate for the loss of capability in some psychomotor skills;
- confirmed previous observations that cannabis adversely affects drivers' tracking ability;
- found that tracking performance deteriorated with increasing dose level;
- judged that the general medical examination and standardised impairment testing applied by the police surgeons were generally effective in determining impairment.

In terms of road safety the results show a clear worsening of driver capability following the ingestion of cannabis or the ingestion of cannabis and alcohol together at the doses used, in comparison with placebo (i.e. having taken neither). Within the sample of drivers, the effects of alcohol (at a dose of just more than half of the UK legal limit) and cannabis taken together were slightly greater than with cannabis alone. Given that other research has extensively shown the rapid increase in the risk of accident, particularly fatal accident, with increasing blood alcohol level, the present results show how important it is to avoid any combination of alcohol and cannabis, as well as avoiding alcohol and cannabis taken on their own, before driving or riding.

Related publications

TRL477 *The influence of cannabis on driving* by B F Sexton, R J Tunbridge, N Brook-Carter, P G Jackson, K Wright, M M Stark and K Englehart. 2000 (price £50, code N)

TRL464 *Recognising drug use and drug related impairment in drivers at the roadside* by R J Tunbridge, M Keigan and F J James. 2000 (price £25, code E)

TRL226 *Validation trial for testing impairment of driving due to alcohol* by B F Sexton. 1997 (price £25, code E)

RR202 *The incidence of drugs in road accident fatalities* by J T Everest, R J Tunbridge and B Widdop. 1989 (price £20, code A)

SR441 *A review of drinking and drug taking in road accidents in Great Britain* by B E Sabey. 1978 (price £20)

CT42.2 Alcohol, drugs and driving update (1996-1998) *Current Topics in Transport: selected abstracts from TRL Library's database* (price £20)

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