



Bicycling under the influence of alcohol



Dick de Waard^{a,*}, Sjoerd Houwing^b, Ben Lewis-Evans^a, Divera Twisk^b, Karel Brookhuis^a

^a University of Groningen, Traffic Psychology Group, Neuropsychology, Groningen, The Netherlands

^b SWOV, PO Box 93113, 2509 AC The Hague, The Netherlands

ARTICLE INFO

Article history:

Received 1 August 2014

Received in revised form 22 February 2015

Accepted 9 March 2015

Available online 29 April 2015

Keywords:

Bicycling
Alcohol
Breath samples
Prevalence
BAC

ABSTRACT

Objective: According to international data estimates the proportion bicyclists with a positive Blood Alcohol Concentration (BAC) who are involved in accidents ranges from 15% to 57%. This large variance, and the fact that the reliance on accident statistics means that only the BAC of injured bicyclists is being collected, shows that we do not really know what the average and variation in BAC of bicyclists is, particularly on nights out.

Method: On a total of four nights between 5 PM and 8 AM BAC levels of bicyclists were collected with a Breathalyser ($N = 687$). Samples were collected in two Dutch cities, one with a high (Groningen), and one with a modest, student population (The Hague).

Results: The results showed that the percentage of bicyclists who had alcohol in their blood rose over the night from 7.7% at 6 PM to over 89% after 1 AM. Furthermore, the percentage of bicyclists with an illegal BAC above 0.5 g/l rose from zero percent at 6 PM to 68% at 1 AM. The average BAC of bicyclists with a BAC above zero was 0.79 g/l. Differences between the two cities were limited.

Conclusion: Cycling with illegal levels of blood alcohol turns out to be very common on nights out in the Netherlands.

© 2015 Elsevier Ltd. All rights reserved.

1. Introduction

International accident statistics suggest that alcohol plays an important role in the fatal accidents of bicyclists. Li and Baker (1994) found that on the basis of the Fatal Accident Reporting System (FARS), that 32% of bicyclists involved in a fatal accident had a Blood Alcohol Concentration (BAC) above zero, and that 23% had a BAC above 1 g/l (1 g/l equals 1‰), which was at that time the legal limit in many states of the USA. In line with this are the findings of Spaite et al. (1995) who reported that the consumption of alcohol and cycling is associated with greater injury severity. Specifically, that 15% of the recorded injured bicyclists had elevated alcohol levels, while 50% of the adult bicyclists who died had alcohol in their blood (Frank, Frankel, Mullins, & Taylor, 1995). More recently Orsi, Ferraro, Montomoli, Otte, and Morandi (2014) found that in the German In-Depth Accident Study (GIDAS) database that 57% ($N = 138$) of the bicyclists involved in accidents had a BAC above 0.5 g/l, which is the legal limit in Germany. Taylor et al. (2010) also report that the risk of injury increases with increased alcohol use; for motor vehicle accidents, the odds ratio increases by 1.24 per 10 g pure alcohol increase up to 52.0 at 120 g. A Finnish study also showed that the risk on being injured while cycling with a BAC of 1.0 g/l is ten times as larger than the risk of injury for a sober bicyclist (Olkkonen & Honkanen, 1990). In addition to the effects of alcohol itself,

* Corresponding author at: University of Groningen, Traffic Psychology Group, Grote Kruisstraat 2/1, 9712 TS Groningen, The Netherlands. Tel.: +31 50 3636761.

E-mail addresses: d.de.waard@rug.nl (D. de Waard), Sjoerd.Houwing@swov.nl (S. Houwing), b.lewis-evans@rug.nl (B. Lewis-Evans), Divera.Twisk@swov.nl (D. Twisk), k.a.brookhuis@rug.nl (K. Brookhuis).

another possible contributing factor to the severity of injuries is that the lack of helmet use is frequently reported in cases of alcohol intoxicated bicycle accidents (e.g. Crocker, Zad, Milling, & Lawson, 2010; Frank et al., 1995; Li, Baker, Smialek, & Soderstrom, 2001; Spaite et al., 1995). Given that intoxicated bicyclists have been reported to have an increased risk of head and face injury, higher even than is typical for bicyclists, has also increased general comments supporting the use of helmets by bicyclists by some researchers (e.g., Andersson & Bunketorp, 2002), however, others state that the positive effect of helmets should not be overestimated (Robinson, 2010).

One of the reasons people cycle under the influence of alcohol could be that they do not wish to drive a motor vehicle after having consumed alcohol. From a social perspective this could be, in an odd way, praised. This is because, in principle, bicyclists themselves are most vulnerable while under the influence of alcohol, while in a motor vehicle in addition to being a large threat to themselves they also pose a larger potential threat to other road users. Alternatively, it could be that people are not aware of full legal regulations with regard to being on the road while intoxicated. In the Netherlands the law states that driving a car or motorcycle with a BAC above 0.5 g/l is illegal, while for novice drivers this limit is 0.2 g/l. For cycling the limit is 0.5 g/l for all, novice or otherwise. Despite this law, cycling under the influence of alcohol seems to be common in the Netherlands. For example, Verster, Van Herwijnen, Volkerts, and Olivier (2009) found in a survey that most students travel home by bicycle after having consumed alcohol, with an estimated average BAC of 0.95 g/l. However, their estimate was based on a questionnaire study, not on actual measured levels. Furthermore, students can be expected to have a higher education level on average, but whether there is a relation between education level and bicycling under influence is not clear. On the one hand, Bernstein, Galea, Ahern, Tracy, and Vlahov (2007) report that a lower level of education coincides with more alcohol consumption, but on the other hand students are found to make more frequent use of their bicycle. For example, in the Netherlands, in 2011, only 12.5% of the students possessed a car opposed to 50.1% of the total Dutch population (CBS, 2014).

Gender may also play a role. In general men consume more alcohol than women (Nolen-Hoeksema, 2004). Males have also been found to be more impulsive under the influence of alcohol (Labouvie & McGee, 1986; Nagoshi, Wilson, & Rodriguez, 1991), which may be reflected in more easily accepting risks such as cycling under the influence of alcohol. Orsi et al. (2014) indeed found that female bicyclists involved in accidents were less likely to have consumed alcohol, and Li and Baker (1994) found that positive test results for alcohol in males occurred twice as often when compared to female bicycle accident injured parties. They also found that it was in the age range of 25–34 that the largest number of accident involved bicyclists tested positive for alcohol.

Despite the results of the aforementioned studies, and the obvious issue of alcohol impaired bicycling, we are aware of only one group that has taken breath samples of bicyclists via a case controlled roadside survey. In doing so, Li et al. (2001) concluded that alcohol use while riding a bicycle seriously increases the risk on a serious or fatal accident. Li et al. (2001) found BAC levels above 0.2 g/l for one out of three of the fatally or seriously injured bicyclists, and for 3% of the control bicyclists. While this is an interesting matched case-control study showing the effect of alcohol, it did not show how the prevalence of cycling under alcohol develops over a night out. Especially because Li et al. (2001) excluded bicyclists that were injured at night (between 9 PM and 5 AM). The study was also performed some time ago in the USA where cycling is generally not a dominant mode of transport. Whereas, cycling under the influence of alcohol may be even more common on nights out in countries like the Netherlands, where bicycle use is popular (Verster et al., 2009).

In the Netherlands a relatively large proportion of all accidents, 22%, involve bicyclists as the injured parties (Netherlands Institute for Road Safety Research SWOV online database, 2013), and the reported proportion of bicyclists admitted to hospitals who have been drinking is increasing, in particular on weekend nights. In 1993 the proportion of bicyclists admitted to hospital that had been drinking, for 18–24-year olds, was 24%, and by 2008 it had risen to 58%. For 25–59 year olds it rose from 21% to 44% over the same time period. In weekends the presence of alcohol among injured bicyclists appears to be highest after midnight, when one in every two seriously injured bicyclists was found to be under the influence of alcohol during those hours (Twisk & Reuring, 2013). However, this was based on accident statistics, as such information about actual prevalence of cycling under the influence via an assessment of blood alcohol concentrations has, as far as we are aware, not been carried out in the Netherlands or in another country with a similarly high cycling prevalence. Therefore in the present study we tested the blood alcohol concentrations in the breath of randomly selected bicyclists in the streets in two city centres in the Netherlands. The study was performed in Groningen with a large student population and in The Hague. Groningen and The Hague differ in population (in 2014: Groningen had a population of 200,000, and The Hague 510,000), student population (Groningen 50,000, 25%, The Hague 28,000, 5%), and whether there are legal closing times of pubs (none in Groningen, in The Hague most pubs close at 2 AM). As an additional factor the day of the week was included, as in student cities such as Groningen, there tend to be typical evenings when many students go out. As such, the cycling population and their drinking habits on those evenings may be different from weekend nights. Another goal of the present study was to evaluate whether the percentage of bicyclists who cycle under influence of alcohol changes, and whether BAC levels change, over the course of the night.

2. Method

Ethical approval for the study was obtained from the Psychology Ethical Committee of the University of Groningen. The local police in Groningen and The Hague were informed about the study and the dates on which the study was scheduled, but the police were otherwise not actively involved in the study.

Download English Version:

<https://daneshyari.com/en/article/5037411>

Download Persian Version:

<https://daneshyari.com/article/5037411>

[Daneshyari.com](https://daneshyari.com)