The Duration of the Alcohol Hangover

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ABSTRACT

Introduction and aims: Previous research has focused primarily on the severity of the alcohol hangover. Much less is known about the duration of the alcohol hangover. The objective of this analysis was to examine the average duration of the alcohol hangover.

Design and Methods: N=811 Dutch students, aged 18-30 years old, completed a survey on alcohol consumption and their latest alcohol hangover. Overall hangover severity was reported for every two hours after waking up (starting 4am until midnight). Hangover duration was calculated from the moment of stopping alcohol consumption until the first time hangover severity scores reached zero.

Results: During the drinking session that resulted in their latest hangover they consumed a mean (SD) of 5.9 (6.2) alcoholic drinks, followed by 6.5 (2.0) hours of sleep. The start of the alcohol hangover was not assessed, as it can be assumed that BAC approached zero while participants were sleeping. From the moment of stopping alcohol consumption, the average duration of the alcohol hangover was 18.4 (3.8) hours. For the majority of drinkers, hangover duration ranged from 14 to 23 hours. Alternatively, the hangover lasts approximately 12 hours from the time of waking up. Hangover duration correlated significantly with hangover severity and total sleep time, but no significant association was found with the number of alcoholic drinks that were consumed.

Discussion and Conclusions: The duration of the alcohol hangover ranged from 14 to 23 hours, with an average of 18.4 hours after stopping drinking, or alternatively, about 12 hours after waking up.

Introduction

The alcohol hangover refers to the combination of mental and physical symptoms, experienced the day after a single episode of heavy drinking, starting when blood alcohol concentration approaches zero [1]. During the hangover state, cognitive and psychomotor functioning may be affected [2], which in term can impair daily activities such as driving a car [3]. Alcohol hangovers have serious socioeconomic consequences, including absenteeism and reduced productivity, but also increased risk of accidents and injury [4,5]. Roche et al. concluded that the relationship between workers' alcohol consumption patterns and absenteeism is more substantial than previously recognized, and not restricted to a small numbers of chronic heavy drinkers, but also concern the much larger number of risky non-dependent drinkers [4]. Illustrative for the urgency of addressing the alcohol hangover and its negative consequences is the fact that the Australian Institute of Health and Welfare reported that 26% of Australians drink to levels which will cause hangover at least monthly [6].

Up to now, no effective hangover treatment is available [7]. However, the majority of drinkers however would welcome the availability of an effective hangover treatment [8]. In order to develop such a treatment it is first of all important to gain more insight in the causes of the alcohol hangover, and which specific symptoms should be targeted. In addition, information is needed on the duration of the alcohol hangover to ensure a potential hangover treatment is effective over the full time course of the hangover state [9].

Surprisingly, scientific papers usually do not describe the time course and duration of the alcohol hangover. In 1974, Ylikahri et al examined 23 male subjects after consuming alcohol (1.5 g/kg body weight) [10]. Hangover severity was scored throughout the day. The hangover severity scores started to increase 8 hours after drinking and appeared to be most severe 14 hours after alcohol consumption, corresponding to 8am. Starting 16 hours after drinking, severity scores declined rapidly, and after 21 hours after drinking alcohol the hangover severity scores returned towards zero and only a few subject reported hangover symptoms at this timepoint. After waking up, the hangover lasted approximately 12 hours. Given the small sample size and the inclusion of male participants only,

we re-analysed data from a large survey on alcohol hangover to further investigate the distribution of hangover duration [11]. A recent analysis of a subset of this sample [12] revealed that among N=578 students the mean (SD) duration of their most recent hangover, calculated since their last alcoholic drink consumed, was 18.4 (3.9) hours. The drinking session was followed on average by 6.5 (2.1) hours of sleep. Hangover duration correlated significantly with total sleep time, but not with the amount of alcohol consumed or estimated BAC. Interestingly, those who slept longer consumed significantly more alcohol and reported a significantly extended hangover duration. However, despite consuming significantly more alcohol, long sleepers reported significantly less severe hangovers. The current analyses comprises the full sample of N=811 subjects with a past month alcohol hangover. Aim of the analysis was to determine the average duration of the alcohol hangover.

METHODS

Students from Utrecht University aged 18-30 completed an anonymous survey on alcohol consumption and their past month latest alcohol hangover [11]. Subjects were approached to complete the survey at the university campus of Utrecht, The Netherlands. Informed consent was obtained from all subjects. No formal ethics approval was required to conduct this research, according to the Central Committee on Research Involving Human Subjects (CCMO).

In the survey, data were collected on alcohol consumption during their past month latest heavy drinking session, subsequent total sleep time, and next day hangover severity [11]. The number of consumed alcoholic drinks was recorded, start and stop time of drinking, and start and stop time of sleep. Overall hangover severity was reported for every two hours after waking up (starting 4am until midnight). At each time point, participants could rate their hangover severity on a scale ranging from 0 (absent) to 10 (extreme). The sum score of these assessments was computed to serve as overall hangover severity score. Hangover duration was calculated from the moment of stopping alcohol consumption until the first time hangover severity scores reached zero. To enable including them in the analyses, in case the hangover severity score was not zero at the last assessment

(midnight the following day), it was assumed severity would be zero 2 hours thereafter. Statistical analyses were conducted using SPSS (Version 24). Subjects were included in the analyses if they were 18 to 30 years old and did not use drugs on their latest heavy drinking occasion that resulted in a hangover.

Mean (SD) hangover duration was computed, and correlated (Spearman's rho correlation) with Hangover duration correlated significantly with hangover severity, total sleep time, weekly alcohol consumption, the number of past month experienced alcohol hangovers, and the number of alcoholic drinks consumed on the evening before their latest hangover.
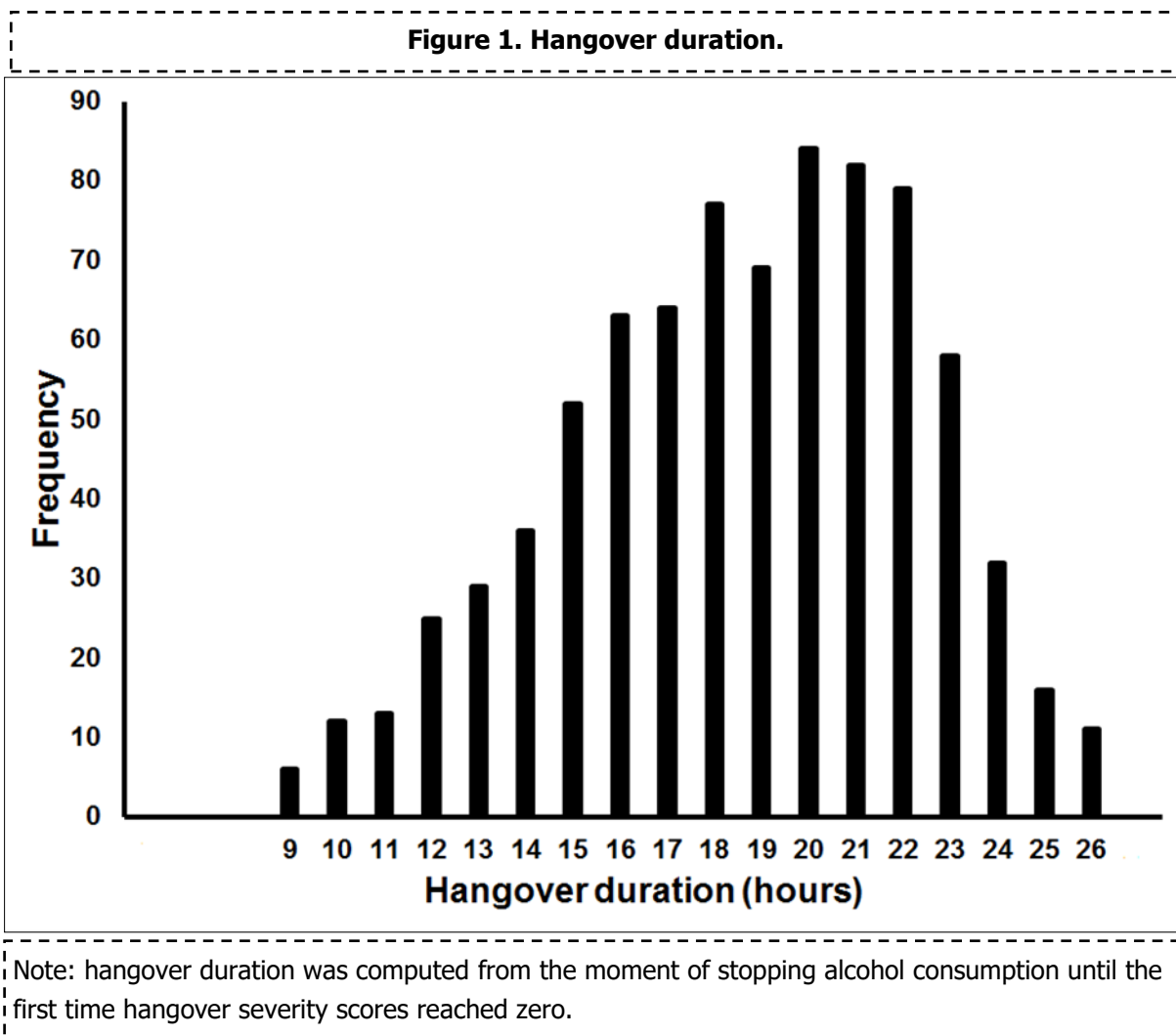
Results

Data from N=811 subjects was included in the analysis (31.0% men). Their mean (SD) age was 20.1 (2.2) years old and they reported consuming on average 18.2 (15.9) alcoholic drinks per week and experiencing 2.4 (2.3) hangover per month. On the evening before

their latest hangover they consumed 5.9 (6.2) alcoholic drinks, followed by 6.5 (2.0) hours of sleep. Overall hangover severity was 23.0 (13.7). Figure 1 shows the distribution of hangover duration across subjects. Calculated from the moment of stopping alcohol consumption, the mean (SD) duration of the alcohol hangover was 18.4 (3.8) hours. From the average moment of waking up, the hangover lasted on average about 12 hours.

Despite the fact that men consumed significantly more alcohol than women (11.0 versus 3.6 alcoholic drinks, p=0.0001), it appears that men recover significantly faster from the alcohol hangover than women (17.9 versus 18.8 hours, p=0.002).

Hangover duration correlated significantly with hangover severity (r=0.627, p=0.0001) and total sleep time (r=0.144, p=0.0001). No significant correlations were found between hangover duration and weekly alcohol consumption (r=-0.032, p=0.364), the number

Figure 1. Hangover duration.

Note: hangover duration was computed from the moment of stopping alcohol consumption until the first time hangover severity scores reached zero.

of past month experienced alcohol hangovers (r=0.032, p=0.375), or the number of alcoholic drinks consumed on the evening before their latest hangover (r=-0.063, p=0.073).

As the analysis included all subjects who reported having a hangover, also subjects with relative low to moderate alcohol consumption levels were included. In one of our previous naturalistic studies it was observed that drinkers consumed 10 to 12 alcoholic drinks on the evening that resulted in their hangover [13]. When selecting only subjects who consumed at least 10 alcoholic drinks, the mean (SD) duration of the hangover was 18.3 (3.7). The similarity was to be expected, given the absence of a significant correlation between total alcohol consumption and hangover duration.

Discussion

For the majority of drinkers, the duration of the alcohol hangover ranged from 14 to 23 hours, with an average of 18.4 hours. A positive significant correlation was found showing that more severe hangovers were of longer duration. However, the number of alcoholic drinks consumed was not significantly associated with the duration of the alcohol hangover. Our findings are in line with those observed by Ylikari et al. who also reported a hangover duration of 12 hours after waking up, corresponding to the average reported hangover duration in the current study [10]. The findings did also not differ from our previous analysis of a subset of this sample [12].

The usual limitations of survey research also apply to the current study. Data are self-reported and may therefore be crude estimates, and perhaps affected by recall bias. This may especially be the case for variables such as the number of drinks consumed. On the other hand, having a hangover is not a regular every day event. Given that adverse effects may have a significant impact on cognitive functioning and mood [14], it is reasonable to assume that at least the duration of the hangover can be adequately remembered.

The importance of our findings with respect to drug development are evident. If a hangover potential hangover treatment wants to be effective, the durations of its effects should last approximately the whole next day following an evening of heavy alcohol consumption.

As the majority of drinkers in this study went to bed between midnight and 2am, adding an average hangover duration of 18 hours suggests that hangovers last until the next evening.

Also from a fundamental scientific viewpoint the current findings are important. That is, future studies investigating the alcohol hangover can now more accurately determine the range of time during which they have to assess/score hangover severity and corresponding symptom severity in order to collect useful data. With regard to biological samples, it would be interesting to assess certain biomarkers of alcohol consumption over the total time of hangover duration and determine for example with variation of severity of specific hangover symptoms. Currently, most hangover studies assess performance and mood in the morning hours. Future studies should extent these assessments into the afternoon and early evening to determine variations throughout the day, and follow recovery from the after effects of a heavy drinking session. In the current survey only overall hangover severity was assayed. In future studies it would also be interesting to investigate individual hangover symptoms such as nausea, headache and sleepiness. Knowledge on the time course of these individual symptoms, and possible variations in severity scores over time, is essential in the development of an effective hangover cure, as ideally the duration of its treatment effect should reflect that of the core disabling symptoms of the alcohol hangover.

From the current analysis, it can be concluded that the duration of the alcohol hangover ranged from 14 to 23 hours, with an average of 18.4 hours after stopping drinking, or alternatively, about 12 hours after waking up.

Beverages. The other authors have no potential conflicts of interest to disclose.

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