LETTERS TO THE EDITOR

Sleep Evaluation by Actigraphy for Drinkers

Tomoyuki Kawada*
Department of Hygiene and Public Health, Nippon Medical School, 1-1-5 Sendagi, Bukyo-Ku, Tokyo 113-8602, Japan

*Corresponding author: E-mail: kawada@nms.ac.jp

Geoghegan et al. (2012) recently reported the sleep quality of 33 college students, aged 20–25 years, using wrist actigraphy in combination with sleep diary and mood questionnaire to know the effect of alcohol on sleep. As a main result, they observed significant decreases in total sleep time and sleep latency associated with alcohol drinking. They speculated on the mechanism in this change of sleep by dividing sleeping period and the amount of drinking.

This raises two queries. First, validation study of wrist actigraphy, named Actiwatch®, is needed by making sleep polyvagnometry as a gold standard, which was also mentioned in the ‘Discussion’ by Geoghegan et al. (2012). Actigraphy is an accelerometer and it does not always reflect sleep status. The initial cut-off value of Actiwatch® was set at 40 counts/min (medium sensitivity), but other cut-off points of sensitivity to judge wakefulness could be selected according to the Users’ Manual of Actiwatch® (2008). On this point, Geoghegan et al. (2012) quoted a paper by Kushida et al. (2001) describing validation on actigraphy. But Kushida et al. (2001) concluded that the best cut-off point to detect wakefulness using Actiwatch® was observed when high sensitivity (20 counts/min) was selected for the analysis. Unfortunately, there was no description on the cut-off point in paper presented by Geoghegan et al. (2012). We recently reported a nap study for young generation in which sleep duration was most validated when high sensitivity (20 counts/min) was selected for the analysis (Kawada et al., 2012), and this value was in concordance with that reported by Kushida et al. (2001).

Secondly, the sample is limited in the Geoghegan study, which restricts consideration of confounding factors on the association between sleep quality and alcohol. For example, Argyriou et al. (2011) conducted a cross-sectional study for caregivers of patients, showing that poor sleep quality correlated with increased levels of anxiety and depression. They used the Pittsburgh Sleep Quality Index and the Hospital Anxiety and Depression Scale and the sleep duration and sleep latency were mostly influenced by the degree of emotional distress. I also reported that subjectively reported sleep duration for subjects with poor sleep quality was negatively related to depressive state evaluated by Patient Health Questionnaire 9-item version (Kawada, 2012). Namely, short sleep duration of poor sleepers was significantly related to the increase of depressive episode. A larger sample would be needed to evaluate the role of such factors.

REFERENCES


© The Author 2012. Medical Council on Alcohol and Oxford University Press. All rights reserved

Investigation of the Effects of Alcohol on Sleep Using Actigraphy

Pierce Geoghegan*, Mairead T. O’Donovan and Brian A. Lawlor
Trinity College Dublin, College Green, Dublin 2, Ireland

*Corresponding author: Medical Department, University College Hospital Galway, Galway City, Co. Galway, Ireland. Tel.: +353-91524222; Fax: +353-16775016; E-mail: geoghep@tcd.ie

We thank Professor Kawada for his interest in our study.

We agree that we should have included the sensitivity setting for the actigraph. We did in fact use the high-sensitivity (20 counts per minute) setting, which as the authors pointed out has previously been suggested to be the best to detect wakefulness when compared with polysomnography.

We accept that a larger sample size would have allowed firmer conclusions to be drawn, in particular in relation to subgroup analyses and comparisons. We pointed out this limitation in our discussion. However, many of the historically significant investigations of the effect of alcohol on sleep have had similarly small sample sizes or smaller, for example Stone (1980) is widely cited in the literature on alcohol, but had only six subjects.

The difficulty in assessing confounding factors is, of course, common in observational studies and even more an issue in observational studies with small sample sizes. Indeed the possibly causal relationship between sleep and mood, and the direction of causality, has in particular been difficult to tease out. We acknowledged this in the discussion.

LETTERS TO THE EDITOR

Sleep Evaluation by Actigraphy for Drinkers

Tomoyuki Kawada*
Department of Hygiene and Public Health, Nippon Medical School, 1-1-5 Sendagi, Bukyo-Ku, Tokyo 113-8602, Japan

*Corresponding author: E-mail: kawada@nms.ac.jp

Geoghegan et al. (2012) recently reported the sleep quality of 33 college students, aged 20–25 years, using wrist actigraphy in combination with sleep diary and mood questionnaire to know the effect of alcohol on sleep. As a main result, they observed significant decreases in total sleep time and sleep latency associated with alcohol drinking. They speculated on the mechanism in this change of sleep by dividing sleeping period and the amount of drinking.

This raises two queries. First, validation study of wrist actigraphy, named Actiwatch®, is needed by making sleep polyvagnometry as a gold standard, which was also mentioned in the ‘Discussion’ by Geoghegan et al. (2012). Actigraphy is an accelerometer and it does not always reflect sleep status. The initial cut-off value of Actiwatch® was set at 40 counts/min (medium sensitivity), but other cut-off points of sensitivity to judge wakefulness could be selected according to the Users’ Manual of Actiwatch® (2008). On this point, Geoghegan et al. (2012) quoted a paper by Kushida et al. (2001) describing validation on actigraphy. But Kushida et al. (2001) concluded that the best cut-off point to detect wakefulness using Actiwatch® was observed when high sensitivity (20 counts/min) was selected for the analysis. Unfortunately, there was no description on the cut-off point in paper presented by Geoghegan et al. (2012). We recently reported a nap study for young generation in which sleep duration was most validated when high sensitivity (20 counts/min) was selected for the analysis (Kawada et al., 2012), and this value was in concordance with that reported by Kushida et al. (2001).

Secondly, the sample is limited in the Geoghegan study, which restricts consideration of confounding factors on the association between sleep quality and alcohol. For example, Argyriou et al. (2011) conducted a cross-sectional study for caregivers of patients, showing that poor sleep quality correlated with increased levels of anxiety and depression. They used the Pittsburgh Sleep Quality Index and the Hospital Anxiety and Depression Scale and the sleep duration and sleep latency were mostly influenced by the degree of emotional distress. I also reported that subjectively reported sleep duration for subjects with poor sleep quality was negatively related to depressive state evaluated by Patient Health Questionnaire 9-item version (Kawada, 2012). Namely, short sleep duration of poor sleepers was significantly related to the increase of depressive episode. A larger sample would be needed to evaluate the role of such factors.

REFERENCES


© The Author 2012. Medical Council on Alcohol and Oxford University Press. All rights reserved

Investigation of the Effects of Alcohol on Sleep Using Actigraphy

Pierce Geoghegan*, Mairead T. O’Donovan and Brian A. Lawlor
Trinity College Dublin, College Green, Dublin 2, Ireland

*Corresponding author: Medical Department, University College Hospital Galway, Galway City, Co. Galway, Ireland. Tel.: +353-91524222; Fax: +353-16775016; E-mail: geoghep@tcd.ie

We thank Professor Kawada for his interest in our study.

We agree that we should have included the sensitivity setting for the actigraph. We did in fact use the high-sensitivity (20 counts per minute) setting, which as the authors pointed out has previously been suggested to be the best to detect wakefulness when compared with polysomnography.

We accept that a larger sample size would have allowed firmer conclusions to be drawn, in particular in relation to subgroup analyses and comparisons. We pointed out this limitation in our discussion. However, many of the historically significant investigations of the effect of alcohol on sleep have had similarly small sample sizes or smaller, for example Stone (1980) is widely cited in the literature on alcohol, but had only six subjects.

The difficulty in assessing confounding factors is, of course, common in observational studies and even more an issue in observational studies with small sample sizes. Indeed the possibly causal relationship between sleep and mood, and the direction of causality, has in particular been difficult to tease out. We acknowledged this in the discussion.

© The Author 2012. Medical Council on Alcohol and Oxford University Press. All rights reserved
when we mention ‘trait differences between individuals’ possibly contributing to differences and explaining some of our observations.

REFERENCE


doi: 10.1093/alcalc/ags131

Advance Access publication 12 December 2012

Is There a Relationship Between Alcohol Quality and Health?

Dirk W. Lachenmeier1,2,* and Jürgen Rehm1,3,4

1Institute for Clinical Psychology and Psychotherapy, TU Dresden, Germany, 2Chemisches und Veterinäruntersuchungsamt (CVUA), Weißenburger Str. 3, D-76187, Karlsruhe, Germany, 3Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada, and 4Centre for Addiction and Mental Health (CAMH), Toronto, ON, Canada

*Corresponding author: Tel.: +49-721-926-5434; Fax: +49-721-926-3549; E-mail: lachenmeier@web.de

(Received 24 May 2012; first review notified 13 July 2012; in revised form 7 August 2012; accepted 13 August 2012)

Abstract — A clear definition of ‘alcohol quality’ is currently not available and the use of the term varies considerably depending on the scientific field and the individual author. Intrinsic factors of ‘alcohol quality’ may be taste and flavour or the absence of certain toxic contaminants. Extrinsic factors may include price, brand image, labelling or perceived authenticity, which are typically unrelated to public health outcomes. This article shows that using the term ‘alcohol quality’ with varying definitions and underlying concepts may lead to misunderstandings, if not to clear misinformation (sometimes also intentionally by industry) when ‘lower quality’ is interpreted as ‘more toxic’ especially in the case of substitution of commercial beverages to unrecorded alcohol. We suggest the use of clearly defined terms instead, such as ‘taste quality’ or ‘brand price’, whenever possible.

In alcohol science, especially in the alcohol policy field, the term ‘alcohol quality’ is regularly used. For example, it is assumed that increase in alcohol price (e.g. due to taxation) may lead to substitution from ‘higher quality’ to ‘lower quality’ brands (Gruenewald et al., 2006). However, there is no clear definition of ‘alcohol quality’. We will argue that using the term with varying definitions and underlying concepts may lead to misunderstandings, if not to clear misinformation (sometimes also intentionally by industry) when ‘lower quality’ is interpreted as ‘more toxic’ especially in the case of substitution to unrecorded alcohol (Lachenmeier and Rehm, 2009).

If we search for the concept of ‘alcohol quality’ (with all variations such as wine/beer/spirit quality) in PubMed and Web of Science, it becomes quickly evident that the use of the term varies considerably depending on the scientific field and the individual author (Table 1). In the food science and technology field and also from a consumer’s perspective, the alcohol quality is mostly determined by intrinsic factors such as organoleptic quality (typical desirable taste and absence of off-flavours). To a lesser extent, the degree of craftsmanship or the absence of certain artificial ingredients are associated with quality in this field (Adams, 2006). The problem is that such indicators are difficult to measure. The restricted literature that is available shows that in most cases consumers were unable to differentiate brands of beers (Allison and Uhl, 1964; Cox and Klinger, 1983; Segal and Stockwell, 2009), malt whisky from blended whisky (Chadwick and Dudley, 1983) or between different strengths of vodka and rum (Lachenmeier et al., 2011a) by taste and a study on US beer brands by professional tasters has shown that there was no correlation between price and taste-test quality either (Anon, 1996). Only panels of highly trained assessors (e.g. according to ISO 8586-1) may have the ability to discriminate products within one category of alcoholic beverages such as types of Scotch whisky or wine (Lee et al., 2001; Zamora and Guirao, 2004).

The observation that the price of alcoholic beverages is not related to intrinsic factors is in line with the economic and marketing literature. The extrinsic definition of ‘quality’ is most extreme in economic science, which sees ‘alcohol quality’ as not only positively correlated with but also sometimes exclusively dependent on price (Ordonez, 1998; Gruenewald et al., 2006). However, marketing research has shown that brand image may be more important in determining product perception than price (Allison and Uhl, 1964; Jacoby et al., 1971; Beverland, 2005; Charters and Pettigrew, 2007; Della Lucia et al., 2010; Szolnoki et al., 2011). The extrinsic ‘alcohol quality’ is therefore assumed to be multifactorial and dependent on indicators such as price, brand image, geographical origin, bottle type, label design, packaging information or perceived authenticity.

It must be stressed that none of the quality definitions mentioned so far is related at all with public health outcomes. The impact of the quality of alcohol on burden of disease [see details in Rehm et al. (2010a)] must therefore be interpreted in the strictest sense of toxicology, meaning that a threshold on the dose–response curve between an ingredient of alcoholic beverages and a public health relevant outcome (e.g. death, or poisoning) must be exceeded prior to the assumption of a health effect (Lachenmeier et al., 2011c). In the past, toxicological thresholds were exceeded only for few substances other than ethanol such as methanol or lead (Lachenmeier et al., 2007, 2012; Rehm et al., 2010a). It is clear that when ‘quality substitution’ occurs in the economical sense (i.e. if the consumer switches from a premium brand to a discount brand due to price increase), this is not directly associated to any health outcome. Although, it may be indirectly, if the switch means that more ethanol is consumed as a consequence. Additionally, less nutrients (such as polyphenols with antioxidant activity) may be contained in cheaper beverages, especially in white spirits (Chick et al., 2011). However, conclusive epidemiological evidence that nutrients in alcoholic beverages may protect against the effects of ethanol is lacking so far (Lachenmeier et al., 2009).

Contrary to what is commonly believed, the assumption of no direct health influence of economic ‘quality substitution’ also upholds if the consumer switches from a commercial alcoholic beverage to unrecorded alcohol (Rehm et al., 2010b; Lachenmeier et al., 2011b). The only exception may again be that the consumer gets higher strength alcohol for a lower price, which may lead to more detrimental health effects due to more ethanol being consumed (Rehm et al., 2010a).