



The rate ratio of injury and aggressive incident for alcohol alone, cocaine alone and simultaneous use before the event: A case–crossover study



Jinhui Zhao ^{a,*}, Scott Macdonald ^b, Guilherme Borges ^c, Chantele Joordens ^a,
Tim Stockwell ^d, Yu Ye ^e

^a Centre for Addictions Research of British Columbia, University of Victoria, 2300 McKenzie Ave, BC V8P 5C2 Canada

^b Centre for Addictions Research of British Columbia and School of Health Information Sciences, University of Victoria, 2300 McKenzie Ave, BC V8P 5C2 Canada

^c National Institute of Psychiatry and Metropolitan Autonomous University, Mexico City, Mexico

^d Centre for Addictions Research of British Columbia and Department of Psychology, University of Victoria, 2300 McKenzie Ave, BC V8P 5C2 Canada

^e Alcohol Research Group, Public Health Institute, 6475 Christie Avenue, Suite 400 Emeryville, CA 94608-1010, USA

ARTICLE INFO

Article history:

Received 9 April 2014

Received in revised form 8 October 2014

Accepted 23 November 2014

Available online 3 December 2014

Keywords:

Alcohol

Cocaine

Case–crossover

Injury

Aggression

ABSTRACT

Objectives: (i) To estimate the rate ratio (RR) of use of alcohol alone, cocaine alone, and both substances simultaneously on acute injury or an aggressive incident, (ii) to compare the RRs for simultaneous use within 3 or 6 h of the event; and (iii) to compare the RRs of two measures of exposure, “hours of feeling effects” vs estimates based on self-reported quantity and frequency of use.

Methods: The study employed a case–crossover design with the frequency approach. Clients ($N=616$) in substance abuse treatment for alcohol or cocaine issues from 2009 to 2012 completed a self-administered questionnaire on their substance use within 3 and 6 h before a recent injury or physically aggressive incident. Clients also reported detailed quantity and frequency information in relation to their typical substance use, as well as information on “feeling effects”. The RR of acute harms due to substance use was estimated using the Mantel–Haenszel estimator.

Results: In the 6-h window before the event, use of cocaine alone, alcohol alone and simultaneous alcohol and cocaine use were each significantly ($P < 0.05$) related to a recent injury and aggressive incident. Simultaneous use was not significantly greater than use of either drug alone. Estimates of RR based on simultaneous use for a 3-h window before the event were consistently larger than those based on a 6-h window, and comparisons were significant ($P < 0.05$) for an aggressive incident but not an injury. With reference to the two measures of exposure, three of eight comparisons of RRs were significantly larger for feeling the effects of the substance in comparison to quantity and frequency of substance use.

Conclusion: These findings are consistent with increased likelihood of harms related to the acute effects of alcohol alone, cocaine alone or simultaneous use. The results are suggestive that the acute effects of these drugs may be better measured within a 3-h time window than a 6-h window. Finally, we found that “hours of feeling effects” yielded higher estimates of RR than the quantity–frequency approach; however both measures support the overall findings.

© 2014 Elsevier Ltd. All rights reserved.

1. Introduction

Research on psychoactive substance use is largely focused on studies of a single substance. Several studies have found that alcohol consumption increased the risk of acute harms such as

injury and violence (Borges et al., 2004; Ye and Cherpitel, 2009; Ye et al., 2010; Borges et al., 2013; Zerhouni et al., 2013). Other studies found that cocaine use also increased the risk of some acute conditions (Macdonald et al., 2003, 2008). However, little research has been conducted on simultaneous use of cocaine and alcohol on acute harms.

Combined use of some substances such as alcohol and cocaine might synergistically increase risks of acute harms such as injury or aggression. Among treatment populations, research has shown that clients frequently use alcohol and cocaine together (Martin et al., 1996; Wiseman and MacMillan, 1996; Pakula et al., 2009).

* Corresponding author at: Centre for Addictions Research of British Columbia, University of Victoria, PO Box 1700 STN CSC, Victoria, BC V8Y 2E4, Canada.
Tel.: +1 250 472 5935; fax: +1 250 472 5321.

E-mail address: zhaoj@uvic.ca (J. Zhao).

Moreover, several studies have shown that the majority of treatment clients who abuse cocaine also consume alcohol, and a high proportion are dependent on both (Heil et al., 2001). One study found that the lifetime prevalence of alcohol problems among cocaine abusers was about 60% (McCance et al., 1995) while another study showed that 88% of cocaine abusers in treatment also used alcohol (Wiseman and McMillan, 1996). Compared to the general population, people with alcohol use disorders are more likely to use cocaine (Walsh et al., 1991).

The little research that has been conducted on simultaneous use of cocaine and alcohol pertains to vehicle collisions specifically. Insights on possible effects of simultaneous use can be deduced from this research. A recent study asked cocaine users in treatment to describe how cocaine use affected their ability to drive a car. The most common responses were found to be that cocaine increased the likelihood of racing or driving recklessly and that cocaine reduced driving ability (Macdonald et al., 2008). If these cocaine-related effects are combined with psychomotor decrements caused by alcohol, the results could synergistically increase the risk of a collision. Specifically, various health-related harms are likely associated with simultaneous use of cocaine and alcohol as compared to the use of each substance alone. If the high is more intense when the substances are combined, thereby impairing one's cognitive and psychomotor coordination, acute consequences such as violence or injury could be greater than the consequences associated with use of either drug alone.

Experimental and biological studies have also found that alcohol (a depressant) and cocaine (a stimulant), when mixed together, produce a new metabolite that can result in different pharmacological effects compared with either drug used alone (Pennings et al., 2002). This might suggest that the alcohol and cocaine combination can increase the tendency towards violent thoughts, leading to an increase in violent behaviors (Pennings et al., 2002). However, due to some challenges, few field studies have been conducted to investigate effects of simultaneous use of cocaine and alcohol on the risk of physical harms such as injury or physical aggression (Martin et al., 1992; Adlaf and Ialomiteanu, 2005). For example, assessing the rate ratio (RR) of the acute effects of cocaine in the event of an injury or aggressive incident has been challenging, as current drug tests for urine specimens detect prior exposure within a long detection period that exceeds the acute effects (Lum and Mushlin, 2004) and potentially more accurate blood tests are intrusive. Furthermore, self-reports of general populations have limitations of under-reporting. To overcome these challenges, we propose a study that uses self-reports of clients in treatment for alcohol and cocaine, and given their admission of problematic use, honest responses are expected (Chatham et al., 1994).

The objectives of this study are: (i) to estimate the rate ratio (RR) of use of alcohol alone, cocaine alone, and both substances simultaneously on acute injury or aggressive incident, (ii) to compare the RRs for combined use within 3 or 6 h of the event; and (iii) to compare the RRs of two measures of exposure, "hours of feeling effects" vs estimates based on self-reported quantity and frequency of use.

2. Methods

2.1. Study design

The study is cross-sectional with a retrospective component, where subjects provided data on their typical use of cocaine and alcohol before an injury or aggressive event in the prior year. The retrospective aspect is exemplified by subjects reporting key aspects of injury or aggression in the prior year. Clients in treatment for their use of cocaine alone, alcohol alone or

simultaneous use of cocaine and alcohol were identified from five substance abuse treatment centres in British Columbia and Ontario from March 2009 to March 2012. Since we aimed to have roughly equal numbers of men and women in our sample and men are much more likely to be in treatment, we recruited 112 women from three treatment agencies for women only. Most clients resided in British Columbia (BC) and Ontario. The response rate was extremely high at 97.8% (Macdonald et al., 2014), identifying 616 clients qualifying for the study.

Within the larger sample of cocaine, alcohol, or simultaneous substance users, those with injuries or aggressive incidents were identified. A case–crossover analysis with the usual frequency approach was conducted to investigate the RR of these acute harms which is an approximation of relative risk. This approach contrasts exposure in the hazard period with the expected exposure based on each individual's usual frequency of exposure over the year preceding his/her acute condition. In this type of study, each patient acts as his/her own control where particular substance use (e.g., alcohol only, cocaine only, or combined use) at the time of the injury or aggressive incident is compared to typical frequency of substance use for each person (Maclure 1991; Mittleman et al., 1993, 1995). Substance use in the hazard period, the 3 and 6 h period immediately preceding the acute event, was compared with its expected frequency based on control data obtained from the patients. Employing the usual frequency of substance use over the year prior to acute events estimated its expected frequency in an average 6 h period in this patient population. The study was approved by the ethics review board at the University of Victoria and respective ethics boards of the treatment providers in situations where treatment was provided within a hospital context.

2.2. Measures of outcome

Injury and aggression were measured using client's self-reported most recent injury or aggressive incident in the 12 months prior to treatment (see Appendix I for the exact questions). Alcohol and/or cocaine use was conceptualized as an exposure that has a time-limited physical effect. Alcohol and/or cocaine produces short-term biological, psychological and behavioral changes until it is metabolized. Therefore, the case–crossover study is designed to investigate the acute alcohol and/or cocaine effect (Maclure, 1991). Alcohol exposure has been defined as at least one drink within 6 h prior to each event in several studies (Vinson et al., 2003; Borges et al., 2004a,b, 2006; Bond et al., 2014). Cocaine exposure was defined as at least one line, one rock or one injection of cocaine/crack within 6 h prior to each event. Exposure to both substances simultaneously was defined as use of alcohol and cocaine within 3 or 6 h prior to the injury or aggressive incident. Questions used to define outcomes; relevant exposures to alcohol or cocaine are presented in Appendices I and II.

2.3. Measures of exposure

2.3.1. Typical alcohol consumption

To investigate typical alcohol consumption, i.e., usual use, clients were asked questions relevant to quantity and frequency of consumption based on days per week drinking, as well as number of drinks consumed on those days. To be consistent with the definition of a "6-h window" of drinking prior to the outcomes, this usual quantity–frequency approach assumes the effect period on a drinking day is 6 h if the usual drinking quantity over the past year is 1–6 drinks, 12 h if the quantity is 7–12 drinks, 18 h if the quantity is 13–18 drinks and 24 h if the quantity is 19+ drinks (Borges et al., 2006). The amount of expected person–time exposure to alcohol was estimated by multiplying the reported usual annual frequency

Download English Version:

<https://daneshyari.com/en/article/572198>

Download Persian Version:

<https://daneshyari.com/article/572198>

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