Reviewer's report

Title: Sleeping problems in Chinese illicit drug dependent subjects

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Reviewer: Subhajit Chakravorty

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Summary: The primary aim of this investigation was to assess for the prevalence of sleep-related complaints (poor sleep quality) in illicit drug users, as compared to a population of control subjects. The secondary aim was to assess for a relationship between poor sleep quality and the duration of substance use. The authors conducted a cross-sectional study, using data from 2178 subjects with a history of drug use, and 2236 control subjects. The survey data consisted of questions related to demographics, drugs used, duration of drug use, and a Chinese version of the Pittsburgh Sleep Quality Index (PSQI). The results showed that 68.5% of illicit drug users had an impaired sleep quality (PSQI total score >5). The prevalence of impaired sleep quality was highest in ketamine users (81.98%), followed by users of heroin (80.24%), followed users of “other” drugs (59.36%) and finally users of “ice” other drugs (54.16%). There was no difference in the habitual sleep duration between illicit drug users and control subjects. The PSQI total score demonstrated a correlation with the duration of drug use ($r = 0.164$, $p < 0.001$). Amongst the categories of illicit drug users, the users of heroin were seen to have the highest PSQI total score, followed by users of ketamine, and then those who used other drugs.

Comments to the authors

The authors report data on the prevalence of sleep problems associated with illicit substance use, an interface area where very little data exists, especially for ketamine and methamphetamine, as they are drugs that are being increasingly abused in China these days. Despite the unique nature of the study there are few issues that diminish the enthusiasm for this study. Please see below for specific comments.

Major Compulsory Revisions

Introduction. The introduction section needs a major revision. Some of the key aspects that make the introduction difficult to follow are as follows:

1. Why is this investigation involving the study of different drugs important, especially in a Chinese sample of illicit drug users?

2. Review some of the existing literature on the relationship between sleep disturbance and opioid abuse/dependence/methadone maintenance, in addition to the Liao et al study. Some of this literature is mentioned in the discussion section.
3. The authors need to briefly review any available data on sleep-related disturbance and the use of ketamine, and stimulants? If there is none, this should be mentioned.

4. Why is the duration of substance abuse an important topic that needs to be investigated by the authors (hypothesis # 2);

5. Hypothesis # 1 - it is preferable to use the term prevalence instead of percentage of poor sleep.

Methods.
1. What was the overall response rate for the survey?
2. Was there a difference in demographic, drug use and sleep related variable between those who completed the survey versus those who did not?
3. Drug Use Categories – more information of the quantity and frequency of use will be helpful to understand the drug use behavior in these subjects;
4. “Other drugs” – what drugs use did this group comprise of?
5. Control subjects – it is unclear how they were recruited and what clinical characteristics they may have had? What inclusion/exclusion criteria were used to recruit them?
6. To further evaluate this relationship between the duration of substance use and poor sleep quality, the authors should have conducted regression analysis between the two variables, adjusting for common covariates such as age, gender, cigarette smoking, alcohol use.

Results.
1. Illicit drug users were recruited from two drug rehabilitation centers – were there any differences in the subject and substance use characteristics between these 2 centers?
2. “ice” users – it may be preferable to use the pharmacological name, i.e., methamphetamine;
3. Illicit Drug Use – how many subjects used drugs across multiple categories, i.e., polysubstance use disorder? It is not uncommon for subjects to use multiple drugs simultaneously; the ramifications of this poly drug abuse behavior may be a higher degree of sleep disturbance, at least theoretically, which in itself may be another interesting finding;

Discussion.
1. The discussion section currently reads like a copy of the results section. This section needs to be drafted again in the context of how these results relate to that of prior research studies;

2. The unique finding of the lack of a difference in the sleep duration between illicit drugs users and control subjects warrants further explanation. This is interesting as many subjects used opioids, a class of drugs that may lead to sleep-continuity disorders and consequently decreased sleep duration, in at least
a fraction of the subjects;
3. The illicit drug-using sample was recruited from two drug rehabilitation centers, thus they were a sample of treatment-seeking subjects. Treatment-seeking subjects may not be representative of all illicit drug users; this should be noted in the limitations;
4. Although snowball sampling helps to identify hidden populations/sub-populations, the limitations of snowball sampling also need to be reported;

Discretionary Revisions

Method.
1. Psychiatric Status – psychiatric disorders are commonly comorbid with substance use disorders, and sleep disorders; it is unclear how the illicit drug users differed from the control population with respect to their psychiatric status; if comorbid psychiatric disorders were present, what were the common ones, e.g., depressive disorder, post traumatic stress disorder;
2. Alcohol and cigarette smoking – these substances are also commonly comorbid with illicit drug use disorders and may aggravate sleep disturbance; more data on them would have been helpful for both the illicit drug users as well as for the control groups;
3. In addition, information relating to their last use of substances will also be helpful, as withdrawal from certain drugs after cessation of heavy use may lead to insomnia or hypersomnia;

Results.
1. Alcohol use – since subjects across the illicit drug users and control condition used alcohol, what was their quantity and frequency of alcohol use? How many met of the subjects met the criteria for heavy/binge drinking, alcohol use disorder (DSM5) or alcohol abuse/dependence (DSM 4)? Did the sleep quality vary by alcohol use status across the groups?
2. Sleep duration and sleep efficiency data in the drug users was skewed – it is possible that sleep duration differed by different categories of drugs used – a graphical representation of this data would have helped the reader understand the differences;

Discussion.
1. It should be noted that lifetime drug use may be a proxy for other variables like other chronic maladaptive behaviors, prior trauma, antisocial/borderline or other personality disorders;
2. Lifetime drug use may be associated with a recall bias and may not be a very useful measure, unless a close friend/family member corroborates this information.
Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests' below.