Reviewer's report

Title: Incidence of Brain Injury and the Relationship with Substance use: Findings from a Longitudinal Community Survey

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Reviewer: Keith Yeates

Reviewer's report:

This article presents a longitudinal epidemiological study of the incidence of traumatic brain injury (TBI) and its relationship with substance use. The participants took part in a large, Australian community sequential-cohort study using a longitudinal survey methodology with two waves of assessments. Participants were asked at both times if they sustained a “serious brain injury”; those who answered yes at wave 2 were divided into those reporting a loss of consciousness of less than 15 minutes (considered mild) versus 15 minutes or longer (considered moderate). The incidence of new brain injury was highest in males and in younger adults. Brain injury was associated with modest declines in physical health scores. Substance use was not a predictor of brain injury, and brain injury was not a predictor of developing substance use problems.

The findings in the study are interesting, although some are essentially replications of previous epidemiological studies showing that males and younger adults are at greater risk for TBI. Perhaps the most interesting result is the lack of association between TBI and substance use; as the authors point out, this may reflect the community vs. hospital-based sample.

Major compulsory revisions:

I continue to be concerned about the definition of injury severity, and am not persuaded by the authors’ response about this issue. In fact, several new concerns arise based on their response. First, they indicate that participants were removed from the sample only if they reported at wave 1 that they had had a serious brain injury resulting in a loss of consciousness (LOC) for more than 15 minutes. This means that the sample could actually include individuals who had mild brain injuries prior to wave 1. I would recommend eliminating from the sample all individuals who reported a previous brain injury of any severity at wave 1 (i.e., regardless of self-reported duration of LOC).

One reason for this recommendation is that self-reports about duration of unconsciousness are unlikely to be reliable or valid; most individuals simply do not know with any precision how long they were unconscious. For this reason, I do not believe the distinction between mild and moderate injury severity at wave 2 is likely to be reliable or valid either. The authors say that they did not use hospitalization as their criteria for severity because that data included other types of head injury. But couldn’t the two questions be combined? That is, would it not
be possible to classify participants as having had a brain injury based on whether they reported at wave 2 having had a serious brain injury (regardless of duration of LOC), and then divide those who reported a brain injury into those whose injuries were associated with hospitalization versus those that did not result in hospitalization? Hospitalization is likely to be a more reliable and valid proxy for severity than the arbitrary division based on self-reported duration of LOC. This would also obviate the problem of classifying individuals who could not report on the duration of LOC into the moderate injury group (see below).

Minor essential revisions:

1) A previous concern that was raised about the paper was the relatively small number of TBI in the various age/severity cells. The authors now appropriately acknowledge this concern as a limitation in the Discussion. But I wonder if it would also be helpful to include confidence intervals for the various cell proportions, to help reassure readers about the stability (or lack thereof) of the estimates.

2) The authors attempted to provide a rationale for classifying injuries as moderate if participants could not report on the duration of LOC. However, the rationale is not convincing; individuals could have many reasons for not being able to report the duration of LOC, aside from more severe injury. I recommend eliminating those participants from the analyses altogether if the method for differentiating severity continues to rely on self-reports of duration of LOC. As already noted, differentiating severity based on hospitalization would avoid this problem.

3) I recommend that the title of the paper be changed to “Incidence of self-reported brain injury and the relationship with substance abuse: Findings from a longitudinal community survey,” to reflect the reliance on self report for identifying brain injury.

4) In the Abstract, I suggest that the authors indicate in what way their data indicate that “factors associated with BI in community samples differ from those reported in clinical samples,” rather than simply making the general statement.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.