Reviewer’s report

Title: Gray-matter Structure in Long-term Abstinent Methamphetamine Users

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Reviewer: Hui Zheng

Reviewer's report:

Thanks for the authors to give me the new information about the abstinent time effects in the gray-matter structure of methamphetamine (meth.) addicts.

This study including 99 meth. and 86 healthy controls (HC), it was really hard work.

The results also improve our knowledge about 'Compulsory detoxification' effects on meth addicts.

But there are some problem should be clarified.

In the background. I can't find a hypothesis about this study. It makes me confused, what's the position of this study? what's a question the authors want to answer? For example, ref 15 shows a longitudinal study about abstinence of meth addicts to answer the relation between ABS and gray mater altered, so why you do this Cross-sectional study?

For the methods. 1. when you analysis the thickness you don't need to include the intracranial volume as the covaries; 2. the education years is most important value for group different, should be added in the ANCOVA analysis, please check https://www.ncbi.nlm.nih.gov/pubmed/27734304 and https://www.ncbi.nlm.nih.gov/pubmed/23796547; 3. the times of Monte Carlo simulation, the version of the surfer should be reported; 4.the history of smoking and drinking, maybe use the self-reported servility score to control the group difference is a choice? 5. The quality of the image should be checked after preprocessing, and the report is deleted.

For the results, 1. I am so curious about the scatter plots about the significant correlation between the ABS/MA use and Thickness/Volume. 2. a little problem with the coordinate system. 3. table 3 shows significant results between two groups, but I didn't find the corrected for multiple comparisons; the highest intensity = 3.7 . 4 also table 3 the intensity of group comparisons is t OR F?

For the discussion, paragraph 3"Providing this particular correlation reflects the effects of releasing from the pressure of MA, these results implicate that chronic MA use induces gray-matter loss in those regions that are recoverable subsequent to prolonged abstinence." I have 3 questions 1. if the positively correlated reflect the recover, how about the negatively correlated? 2. the group compare didn't show overlap in positive correlated, can your plot the correlated between abstinence duration and grey matter volume/thickness and add a line with 95%CI of health control, so we can easily see they have recovered. 3. the

In conclusion, you can't say a conclusion 'executive functions and decision-making' in a grey matter study.
By the way, authors can add newer ref, 16/42 nearly than 2014, like Okita, K., Morales, A. M., Dean, A. C., Johnson, M. C., Lu, V., Farahi, J., ... & London, E. D. (2018). Striatal dopamine D1-type receptor availability: no difference from control but association with cortical thickness in methamphetamine users. Molecular psychiatry, 23(5), 1320.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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