Reviewer's report

Title: Cortico-cerebellar functional connectivity and sequencing of movements in schizophrenia

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Reviewer: Liangsuo Ma

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Major Compulsory Revisions

The authors investigated cortico-cerebellar functional connectivity in Schizophrenia patients. This study is potentially interesting. I think that the manuscript can be significantly improved in the authors can address the following concerns:

Major points

1. Background in Abstract: “Examination of cortico-cerebellar connectivity during movement sequencing task would be, therefore, a test of the cognitive dysmetria hypothesis.” It is weak to state “Examination of cortico-cerebellar connectivity is a test”. This is abstract, you should highlight the implications of your investigation.

2. Methods in Abstract: You included matched control subjects, but it looks like that you did not conduct group comparison (actually you did). In my point of view, you should describe your between-group analysis first, and then describe your within-group analysis.

3. Results in Abstract: This part should be revised accordingly based on my comments #2 and #6.

4. Subjects (Page 4): After checking Table 1, I found that there were left-hand subjects although the major of the subjects were right-handed. It is known that there is laterality in motor activation, which is very important for brain connectivity studies. The left-handed subjects may be a confounding factor for the data. Therefore I urge the authors to remove these left-handed subjects from the analysis.

5. Statistical analyses (Page 6): “we performed a median (SQ=2) split of the patients”. A median split of patients means the number of patients in each sub-group should be similar. However, there were 9 patients in SQ+ sub-group, and 20 patients in SQ- subgroup. In addition, subject-split should be described in the Subject section.

6. Statistical analyses (Pages 6-7): Given the lack of explicit hypothesis (please see my comment #17), I think that it is natural to test the difference between the patients and the controls first. The within-group comparison (between SQ+ and SQ- patients) should be conducted as the second step.

7. Functional connectivity (Page 8): When reporting the correlation results, you
used both mean and median. Could you please unify your measurement?

8. Functional connectivity (Page 8): “There were significant correlations between MC and CRBL (mean r = 0.23, SD 0.16, t = 11.2, p<0.001), and SMA and CRBL (mean r = 0.26, SD 0.17, t = 11.9, p<0.001) BOLD signals.” It is unclear which group are these results for? Patients, patient sub-group, or controls?

9. Functional connectivity (Pages 8-9): You compared correlations between groups (or sub-groups). You also stated that the significance of correlations was tested using one-sample t-test. How one-sample t-test can be used to test group-difference? In addition, did you conducted multiple-comparison correction when you performed these between-group comparison?

10. Functional connectivity (Pages 8-9): You reported differences in the correlations between SQ+ and SQ- patients. Are these two sub-groups matched in age and sex?

11. Functional connectivity (Page 9): You reported differences in the correlations between SQ+ patients and the controls. Are they matched in age and sex?

12. English needs to be improved.

Minor Points:

13. Introduction (Page 3): “Although an abnormal sequencing of movements…”. I think that it should be “abnormal performance…”.

14. Introduction (Page 3): “In fact, correct performance of a sequence of movements requires accurate timing of the…” Here, you used “in fact”, do you mean that the traditional view (in the previous sentence) is wrong?


16. Introduction (Page 4): “lead to abnormalities of movement sequencing…” Again, it is the performance abnormal, not the movement sequencing.

17. Introduction (Page 4): “To test this hypothesis…”, what is your exact hypothesis?

18. Introduction (Page 4): “…to assess its connectivity and to analyze the correlates of cortico-cerebellar connectivity with the magnitude of motor sequencing abnormalities in patients with schizophrenia.” Here you need to specify that it is functional connectivity which was used.

19. Subjects (Page 4): Are there any subjects who did not complete the experiment?

20. Subjects (Page 4): “Details on the demographic and clinical parameters are given in Table 1.” You should point out the tables are supplementary materials.

**Level of interest:** An article whose findings are important to those with closely related research interests
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.