Author's response to reviews

Title: Postoperative Cognitive Deficit after Cardiopulmonary Bypass with Preserved Cerebral Oxygenation: a prospective observational study

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Author's response to reviews: see over
Reply to Reviewer 1

Dear Prof. Hudetz,

thank you for reviewing our manuscript and your thoughtful comments.

Major Compulsory Revisions

1. It is not possible to determine reliably that the 35 patients of our study are sufficient for the present investigation. Hence, we follow the recommendation of reviewer 2 to classify the study as pilot study.

2. We agree that bilateral measurement of cSO2 would have been superior to unilateral measurement. Unfortunately, only one optode was available during the study. However, as you mentioned, hypoperfusion during CPB is generally expected to affect both hemispheres and even with two electrodes regional hypoperfusion or embolism far from the frontal optodes would have been missed by the measurement. We included a phrase concerning this limitation in the discussion.

3. Thank you, we corrected this error.

Minor Essential Revisions

1. We clarified in the manuscript and abstract that cSO2 was kept above 55 % throughout anesthesia including cardiopulmonary bypass.

2. We reviewed the paper for language errors.
3. We included the time of the second neurocognitive testing in the abstract.

4. Thank you for remarking this error. We corrected the numbers. Neurological deficits were evaluated by routine clinical examination at admission to intensive care unit.

   We added this point to the methods section.

5. Cognitive testing was performed on the 5th postoperative day. Thank you for pointing out that discrepancy.

6. The third sentence has been omitted in the corrected manuscript.

7. Thank you, the last sentence of the first paragraph has been corrected.
Reply to Reviewer 2

Dear Prof. Seeberger,

Thank you for reviewing our manuscript and your thoughtful comments. We agree that the small sample size is a limitation of our study. However, our study may serve as a pilot study providing evidence that a larger multi-center trial on this subject is warranted. We changed the title to empathize this.

SPECIFIC REMARKS
Subject enrollment: The main reason for needing 9 month for enrolling 35 patients was the fact that many patients were not willing to participate in the extensive neuropsychological tests. This may bias the study, because active and cognitively capable patients may predominantly have consented to the investigation. However, it is interesting that the incidence of POCD was so high even in these selected patients.

Page 3, line 3: Sorry for the unclear phrase. Dementia was an exclusion criterion.

Presence of unilateral or bilateral carotid stenosis was excluded by preoperative ultrasound examination of the carotid arteries.

Discussion:
We substituted reference 11 by original research. The statement in reference 25 is an assumption made originally by the editorial author based on reference 19. Therefore, we propose to leave the reference unchanged or add reference 19 to the statement.
Page 8, line 3: We agree with your objection and corrected the phrase.

The paragraph “Interventions” has been abbreviated in the revised manuscript to avoid duplication.

Page 9: Thank you. The unilateral measurement was discussed according to similar remarks of reviewer 1.

Conforming to your comments, we classified the work as a pilot study. We conclude that the results support the hypothesis that the incidence of POCD is not improved by keeping cSO2 above – 20 % from baseline and that a larger prospective randomized study could answer the question. We believe that this provisional evidence may be sufficient to initiate large scale trials in the near future.

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