Reviewer's report

Title: Transcranial Doppler to Assess Sepsis Associated Encephalopathy in Critically Ill Patients.

Version: 5 Date: 21 February 2014

Reviewer: Luzius Steiner

Reviewer's report:

The authors present data showing that a higher pulsatility index in the middle cerebral artery on day one after diagnosis of sepsis is associated with development of sepsis associated delirium. The presented data are interesting, yet to me the arguments that this is a robust relationship and not simply a reflection of more severe disease are not quite convincing:

Major compulsory revisions

1. I am somewhat surprised by the data in Table 1: A relevant number of patients is in septic shock, yet the CRP values and mortality suggest that the patients were not very ill. Please comment
2. Please add data on vasoactive drugs. How do you know that your changes in PI are not a reflection of more severe disease and use of vasoactive drugs?
3. Please add a sample size calculation. Is your sample sufficiently large to exclude a type II error in your multivariate analysis?

Minor essential revisions

4. Your Determination of PI is based on a very brief recording. Do you think this is representative? Please comment.
5. How many times per day did you perform the CAM ICU Screening?
6. p.4/5 you write "Given that we evaluated static PI, we expected that an increased PI will be related to relative prolonged microcirculation disturbances and cerebral hypoxia. Therefore, we expected that neurological symptoms might be persistent or even present later than the initial measurement" As you are not measuring cerebral hypoxia, this sentence needs to be changed or moved to the introduction

Level of interest: An article of limited interest

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