Reviewer's report

Title: Relative cerebral hyperperfusion during cardiopulmonary bypass is associated with risk for postoperative delirium: a cross-sectional cohort study

Version: 0 Date: 18 Nov 2018

Reviewer: Raffaele Aspide

Reviewer's report:

Really interesting topic but I did not quite understand the homogeneity of the population considered: what characteristics did the population have regarding the general risk factors for POD such as alcohol and drugs abuse, cognitive impairment, malnutrition, sleep disorder, duration of surgery, HES use, post-op pain to rest or basically the risk factors for POD in ICU (age, dementia, hypertension, pre-ICU emergency surgery or trauma, Acute Physiology and Chronic Health Evaluation II score, mechanical ventilation, metabolic acidosis, delirium on the prior day, and coma).

If authors confirm that it is a prospective observational study combined with a cross-sectional study, it will be precious to use STROBE checklist as platform.

As cross-sectional study, it is difficult for me follow the design when authors found 32% of hyperperfusion experience inside no-POD group and when analyze the 21 patients subcohort with lower MCAVbas: which of these patients are in the two beging groups? why the no-POD group patients with hyperperfusion don't develop POD?

Do the "duration" of hyperperfusion experience have a more important physiopathological role in the POD development? Even the CPB management have an important role.

Authors used AI (autoregulatory index) applying Zazulia's formula that look like to be tested on animal models with Alzheimer's disease; we love TCD and dynamic assessments, but we know the limits to assess CBF by TCD: probably will be usefull to specify that in a paragraph dedicated to the study's limitations.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

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

Unable to assess

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

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

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