Reviewer’s report

Title: Cardiac Surgical Outcome Prediction by Blood Pressure Variability Indices Poincaré plot and Coefficient of Variation: an Observational Study

Version: 1 Date: 09 Jan 2020

Reviewer: Larissa Neumann

Reviewer's report:

Thank you to the authors who made adaptions and responded to the raised issues.

I still recommend rejecting the revised manuscript, because some major problems have not been corrected.

I recommend rejecting the manuscript, as there has been a recent study of Jinadasa and colleagues, [Jinadasa, Sayuri P., Ariel Mueller, Varesh Prasad, Kathirvel Subramaniam, Thomas Heldt, Victor Novack, and Balachundhar Subramaniam. 2018. "Blood Pressure Coefficient of Variation and Its Association With Cardiac Surgical Outcomes." Anesthesia and Analgesia 127 (4): 832-39.], in which a part of the results of this manuscript have already been reported (see table 1 and table 2, both in the manuscript as well as in the article of Jindasa and colleagues).

In addition, the Poincaré analysis did not perform well in the prediction of 30-day mortality or renal failure. Thus, the manuscript does not add new information to the research field.

While reading the manuscript, it was not completely clear, that a part of the analyzed data has already been published and that this analysis was a further analysis on the same topic. Except the Poincaré analysis, exact the same study protocol was followed by Jindasa et al. Content of patient cohort, perioperative management, measurement and data collection, statistical analysis, power analysis and a part of the results are absolute identical. Even results presented in the tables (table 1 and 2) and figure 1 are equal to those in the article of Jindasa et al.

The authors of the manuscript mentioned this comment: "Our previous work, showed a significant association between BP variability (defined as Coefficient of Variation, CV) and postoperative outcomes [6]. In this study, we took the next step …" (chapter Background, page 4, line 56ff). However, even by reading the chapter methods, the reader cannot conclude, that the exact study protocol was used as in a recent study. In addition, the authors of the manuscript mentioned the previous study not as their own anymore in the last chapter Discussion by saying: "In a recent retrospective analysis of intraoperative BP variability, it was found that …. [6]. Nonetheless, the authors concluded … ".

In case the editor decides to accept the manuscript, please find my recommendations below.

MAJOR FLAWS

1. Thank you for your responses.
a) No adaptations have been made. Please inform the reader at the very beginning of your manuscript that you have performed a similar analysis on the same topic (published 2018).

b) No adaptations have been made. Please do not present results which have already been published in another article without referencing to that article (table 1, table 2, figure 1, abstract line 48, chapter Results line 11-43).

c) Thank you for the adaptations.

d) No adaptations have been made. Please find attached two images with the sections in table 1 (marked red) that differ in both studies (the manuscript, and the article of Jinadasa et al.), whereas all other values are identical. Please re-double-check those values and correct them if necessary.

2. Thank you for your responses.

a) No adaptations have been made. Please explain the reason why you "took the next step" to the reader and add this information to the manuscript.

b) No adaptations have been made. Please add this information to the manuscript (Why did you choose to use the Poincaré plot?).

c) Thank you for your response. Partly adaptations (An explanation on the Poincaré plot should rather be provided in the chapter background or methods than in the chapter discussion).

The following section can still be found in the discussion section:
"A Poincaré plot is a quantitative, graphical tool that provides a visual representation of the non-linear aspects of a time series data sequence on a phase-space or Cartesian plane [13]. Each data point on the time-series is plotted against the subsequent data point. In a non-linear data sequence, each data point can have its influence on few or more subsequent data points. This contributes to the short-term and the long-term variability of the sequence. There are a number of descriptors being used to quantitatively describe the information conveyed by the Poincaré plot [18]. By far the most widely used technique is the ellipse fitting technique. This involves fitting an ellipse into the shape of the plot, with the center of the ellipse aligned to the center point of the plot [24]. The metrics obtained from the ellipse include the short and long semi-axes, which correspond to SD1 and SD2 respectively [24]."

Please provide this information in the Background section to inform the reader about Poincare Plots in the beginning of your manuscript.

3. Thank you for your responses.

a) Please add this information to your manuscript.

b) Please add this information to your manuscript.

c) Please add this information to your manuscript.
d) Please add this information to your manuscript.

e) Please add this information to your manuscript.

f) Thank you for the adaptions.

g) Please add this information to your manuscript.

h) Please add this information to your manuscript.

i) Please add this information to your manuscript (in text, not only in a table).

4. Thank you for your responses.

a) Thank you for the adaptions.

b) The results in table 1 and table 2 are almost perfectly identical in your manuscript and the article of Jindasa et al. Please describe this clearly in your result section.

c) Thank you for the adaptions.

d) Thank you for the adaptions.

e) Thank you for the adaptions.

f) Thank you for the adaptions.

5. Thank you for your responses.

a) Please add this information to your manuscript.

b) Thank you for the adaptions.

c) Please add this information to your manuscript.

d) Please add this information to your manuscript.

e) Please contextualize these other findings with your findings.

MINOR FLAWS

Thank you for your responses and adaptions.
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

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

Acceptable

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

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