Reviewer’s report

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

Version: 0 Date: 22 Oct 2019

Reviewer: Steffen Schulz

Reviewer's report:

Major comment:
The authors should investigated age-gender subgroups to prove if their main findings in respect to Poincaré plot analysis possible resulting from well-known age-gender effects on autonomous regulation, as blood pressure.

General:
The Poincaré plot is a linear method and not a nonlinear one. However, there exists some new versions of the Poincaré plot analysis which deal with nonlinear aspects. (e.g. Segmented Poincaré plot analysis).

Abstract:

Please define "C-statistics".

Please provide the age-gender distribution of the investigated patients.

How long were the time series lengths of the BP data?

Please define "performed poorly".

Please exclude the first sentence of the conclusion paragraph.

Please exclude the keyword non-linearity.

Background:

Please define "high-risk group".
What is exactly meant with "Advanced hemodynamic"?
In which way "significant association between hemodynamic …"?
Please correct. "It provides qualitative visualization of nonlinear dynamic changes" into "It provides qualitative visualization of linear dynamic changes".

Methods:
Patient Cohort: Please provide the age-gender distribution of the investigated patients.
Data analysis: Why both signals, SBP and MAP were used?
"CV is defined as the standard deviation divided by mean" The standard deviation and mean of what?
How long were the investigated signals for your data analysis? Seconds, minutes, hours, days, …?
Statistical analysis: p<0.0x was considered for statistical significance?

Discussion:

"In this study we used a novel measure of BP variability …" Please delete "novel"!
"…and this is the first time it has been used in the context of BP." That's not true! There are other studies using Poincaré plot analysis in the context of BPV. (e.g. S Schulz, M Koschke, KJ Bär, A Voss, The altered complexity of cardiovascular regulation in depressed patients, Physiological measurement 31 (3), 303)
"It is possible that the use other measures of complexity such as the multi-scale entropy may significantly add to the performance of the current models." As mentioned before, e.g. SPPA, compression entropy, conditional entropy, …. 

Conclusion:

Please exclude the first sentence of the conclusion paragraph.

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.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

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

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