Reviewer's report

Title: Exercise capacity and body mass index - important predictors of change in resting heart rate

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Reviewer: Magnus T. Jensen

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The authors evaluate factors associated with RHR and change in RHR over a period of 2.9 years in 6683 subjects without known cardiovascular disease. Multiple linear regression analysis was used to examine delta-RHR adjusting for possible explanatory factors.

The mean change in RHR was -1.1 beats/min between two consecutive visits. The main finding is that age, female gender, baseline RHR, HDL-c and MET have a beneficial effect on heart rate change (decreased RHR), while increasing body weight (expressed as delta-BMI) and presence of dyslipidemia have an adverse effect (increased RHR).

Overall, heart rate is a very topical subject and of relevance. RHR has been shown to be associated with risk in multiple cohorts (Reviewed eg. in Jensen et al 2019, Scand J of Lab Inv.). Factors relating to change in heart rate can be of interest.

Specific comments.

1. A potential framing of the article could be the increasing interest in fitness and heart rate tracking, however, this topical subject has not been touched upon.

2. Table 3 is not clear: The authors state "Multiple linear regression analyses were used to test heart rate increase over time" - But some of the participants had a decrease in RHR. How should that be read?

3. Due to randomness, some of the participants would have a change in heart rate purely due to chance. I would suggest to include a "no change" category, for instance between +/- 3 or +/- 5 bpm. This might also change the choice of statistical model.

4. Another large methodological factor is regression towards the mean. The authors have not discussed this methodological issue and how it impacts the results.

5. There is a very large spread in the change in RHR, as shown in figure 1 - from -30 to +30. This should be commented. Some of the differences are most likely not due to biological factors, but other factors such as measurement error, change in measuring circumstances, regression towards the mean, and others. Please comment.
6. Follow-up is very short, only ~3 years - would the authors expect heart rate to change over such a small time period? What would the potential biological mechanism be?

**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 recommend additional statistical review

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