Reviewer’s report

Title: Cardiovascular magnetic resonance feature tracking in small animals - a preliminary study on reproducibility and sample size calculation

Version: 0 Date: 06 Jun 2017

Reviewer: Christopher K. Macgowan

Reviewer’s report:

This is a pilot study to determine the reproducibility of myocardial motion / deformation measured in mice using feature tracking of cine cardiac MRI. The investigators applied the method to a small (N=6) group of mice and measured intra- and inter-observer variability. The goal was to provide estimates for future power calculations for studies of myocardial disease and therapy in small animal models.

The manuscript is appropriately concise and reasonably motivated. Given the focus and brevity, another article type (e.g., Note, Technical Communication, etc) would be appropriate if available within this journal.

A general comment is that the details of the feature tracking method itself are not described, but instead are part of a commercial package. To what extend are these methods standardized between different vendors, and how might the methods change given this research topic is still evolving? These are important questions for readers.

P3, line 55

"small study sample could be sufficient to detect changes if parameter variability is low."

Please add quantitative results (or example) to the abstract.

P4, line 5 "Myocardial deformation parameters arise as a new potential biomarker for the detection of early myocardial dysfunction."

Recommend cutting this first sentence as not a specific conclusion of presented work.

P4, line 11 "using CMR-FT technique in small animal models appear to be highly reproducible."

Would prefer a more clear statement based on your results eg 'pilot study showed excellent (or good etc) reproducibility …'

P10, line 39 "a and b are multipliers for conventional values of α and β" perhaps should be "are factors for …". Also α and β are not defined here but perhaps are sufficiently well known. Also, I am unsure if this formula is necessary to include at all.
P11, line 19 and Figure 2:  
The vertical and horizontal scale on Figure 2 could be constant across frames to help visual comparison. Also, the horizontal and vertical axes could be of the same unit scale. 

While the variability between measurements is quoted as small and unbiased, they appeared relatively large compared to the magnitude of the actual changes being measured. This may be acceptable for animal model studies looking at population differences (as proposed), but insufficient for individual, patient-based research (ie, diagnosis). A comment on this distinction / observation would be helpful in the Results and/or Discussion, along with a comparison with previously published results in human studies.

The ICC definitions in the Methods (excellent for ICC >0.74, good for ICC 0.60-0.74, fair for ICC 0.40-0.59, and poor for ICC <0.40) did not seem to be respected throughout the Results and Discussion. For example, I expected "was good inter-observer reproducibility for EccSAX: ICC 0.79..." to be "excellent".

P13, line 4:  "STE" not explicitly defined, but appears in list of abbrev. (unsure if this is part of the future publication, so would include definitions throughout the body of the manuscript also).

**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.

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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