Reviewer’s report

Title: Impact of a Training Program Incorporating Cardiac Magnetic Resonance Imaging on the Accuracy and Reproducibility of Two-dimensional Echocardiographic Measurements of Left Ventricular Volumes and Ejection Fraction

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Reviewer: Roberta Esposito

Reviewer's report:

Comments to the Author
Nabeshima et al. present the improvement of the accuracy of two-dimensional echocardiographic (2DE) left ventricular (LV) measurements after a specific training program using cardiac magnetic resonance (CMR).

They also argue that since the degree of improvement is individual, we would need to individualize training programs for each institution to reduce inter-institutional variability.

The use of coverage probability (CP) as a quality control parameter in this paper is original and potentially innovative.

The paper is very well-written and statistical analyses are appropriate and well-conducted, giving a comprehensive good quality to the manuscript.

However, there are some issues that must be addressed before the paper can be accepted.

Major:

1. The lack of standardization of practice period after training intervention and the lack of objective evaluation of that period make unfair conclusions about that issue.

2. Assuming the known LV volumes underestimation with 2DE in comparison with CMR, how do the authors explain that 2DE-LV end-systolic volume (LVESV) was higher underestimated than 2DE-LV end-diastolic volume (LVEDV), resulting in LV ejection fraction (LVEF) overestimation?
Minor:

1. The possibility to choose one from three consecutive cardiac cycles for 2DE examination could introduce a possible confounder, please detailed how you can minimize possible differences between consecutive cardiac cycle (i.e. requiring patient breath-holding).

2. Since the acquisition of 2DE images impacts on the reliability of 2DE measurements, it is important to know if 2DE datasets were acquired by one or more different sonographers.

3. It was not specified if CMR manual LV endocardial border traces was made by the same operator as the expert that visited each hospital for training intervention.

4. It seems that lines list does not perfectly fit with actual paper line-spacing, please correct and consider it for right positioning of the following issues.

5. Page 4 Line 44: please correct to "LV volumes" in line with the other parts of the article.

6. Page 12 Lines 13 and 15: it is the first time that appears "EDV" and "ESV" acronyms in the paper, so please provide spelling or change to LVEDV and LVESV, as in the other parts of the paper.

7. Page 14 Lines 15 to 20: the sentence "Another possible explanation is that the number of echocardiographic examinations performed per one sonographer per year could negatively affect the impact of improvement" is not very clear and not supported by data, please try to better explain or rephrased it.
Level of interest
Please indicate how interesting you found the manuscript:

An article whose findings are important to those with closely related research interests

Quality of written English
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Acceptable

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