Author's response to reviews

Title: A new 2D-based method for myocardial velocity strain and strain rate quantification in a normal adult and paediatric population: assessment of reference values.

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Author's response to reviews:

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To

The Editor,

Cardiovascular ultrasound

Sub: Revision of the manuscript titled: A new 2-D based method for myocardial velocity strain and strain rate quantification in a normal adult and pediatric population: assessment of reference values. And replies to the Reviewer’s comments.

Please find the revised manuscript.

We thank the reviewers for their interest in the manuscript and their valued comments. We have revised the manuscript as follows:

Reviewer 1:

Thank you for your interest and kind comments.
1. Inter-observer and intra-observer variability has been assessed and described in details in the methods and in the results session. Two references relative to this test (11 and 12) have been added.

2. The manuscript has been thoroughly revised, edited and the discussion particularly shortened and made more focused by an English native speaker. Punctuation etc now more in use.

3. Figures and references are now in chronological order as in the text.

Reviewer 2:

Thank you for your interest and kind comments.

1. We fully agree with the reviewer and have addressed the intrinsic limitation of Speckle Tracking in that we do not know in absolute terms what we are measuring.

2. We have deleted our comparative data with TDI (we only mentioned TDI measurements that we investigated with our technology citing the appropriate literature).

3. We have changed the title as suggested. We added some comments on the explanation of the low feasibility in short axis.

4. Inter-observer and intra-observer variability has been assessed and described in details in the methods and in the results session. Two references relative to this test (11 and 12) have been added.

5. We have re-written, focused and shortened the discussion and also discussed the limitations and advantages of this new technology, now and for the future.

6. Due to the high repeatability of the measurements and the homogeneity of the data obtained in the two normal populations, we believe that it is not necessary (or even redundant) to have a validation by phantom assessment. After all, phantom validation is usually done by engineers and technologists at the first steps of the software development and as far we know, this has already been done by the inventors of the algorithm and software developers.

7. We eliminated figure n°5 that reported TDI comparison and re-numbered the figures, accordingly. We respected the order of appearance both for figures and for the literature, as recommended by the reviewer n°2.

8. Furthermore, a complete validation with MRI has not been done, yet. This system is anyway getting into the clinical practice very rapidly and it will take the
place of TDI technology giving much larger amount of information, (we briefly stated this at page 12 295-2799). The reason why these technologies are not largely used in clinical practice at present is due to the lack of knowledge of cardiologists on one hand and also the fact that the post-processing is long and time consuming on the other. At this time a validation with MRI could be interesting but we do not think that it will change that much the application of 2D Strain that has been already applied to assess changes in strain, strain rate and torsion induced by different treatments. Technical accuracy is satisfactory, and it is easily and non-invasively applicable to large population with heart disease. Apart from MRI validation the results obtained in our study and in other studies are comparable with those obtained by MRI; such comparison is even better than that achievable for ventricular volumes measurements obtained with the two techniques. Regarding MRI validation and even possible limitation of this technique we added a comment in the discussion with new references (21,22). Regarding the future of these technologies, we found very interesting, the recent article published by Citro et al. in Cardiovascular Ultrasound 2008, 6:54. We have therefore added the article in the references as well as a final comment in the conclusions.

9. In the conclusion section we also added a sentence to emphasize the importance of giving normal values in a normal population of children and adults.

Thanks again for having considered our paper for possible publication in the journal; we do hope that with your fruitful and thoughtful comments the manuscript has improved and is now suitable for publication.

If you any further queries, please don’t hesitate to contact us.

Yours truly

Best wishes

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