Reviewer’s report

Title: Age and gender specific normal values of left ventricular mass, volume and function for gradient echo magnetic resonance imaging: a cross sectional study

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Reviewer: Oronzo Catalano

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The study was designed to give age and sex specific normal ranges of left ventricle (LV) volumes, mass and function for cardiac magnetic resonance (CMR) exams at 1.5 Tesla (T), using gradient echo (GE) sequences.

The aim of the study is clear, methods are overall appropriate, results well exposed and conclusions adequately supported by data.

However, discussion of the study results and comparison with previous published studies are lacunose.

MAJOR COMPULSATORY REVISIONS

1. The main concern with the study by Cain et al. is methodological but linked to the study rationale too. The authors used GE cine sequences to evaluate left ventricle volumes, mass and function. Nowadays, GE cine sequences are seldom employed for this purpose with 1.5 T scanner. Indeed, balanced steady-state free precession (SSFP) sequences have rapidly become the gold standard for cine cardiac imaging at 1.5 T, as a result of their high SNR performance and excellent blood-myocardium contrast. As properly cited by the authors, in a recent study by Maceira et al. age and gender specific normal ranges of LV parameters with SSFP sequences have been already reported. Moreover, the advocated use of 1.5 T GE normal ranges as references for CMR exams at 3.0 T is not a clear rationale for the study (it should have been best conducted with a 3.0 T scanner).

MINOR ESSENTIAL REVISIONS

1. Abbreviations in the abstract are not always adequately explained.

2. The sentence in the abstract “SV and EF decline rapidly in adolescence and then slowly throughout life” is not adequately supported by data.

3. It is not clear if an equal number of subjects was included in each decade of age (it would seem no). This might be important as a previous study by Bellenger et al. (1), suggested a minimum sample size of 10–15 patients to detect between groups significant differences in the left ventricle parameters.

4. In the 'Tracing of endocardial and epicardial contours' section of methods: what does it mean “...measurements (...) in each image frame were calculated in
the short-axis views to minimize partial volume effects.”?

5. Reproducibility analysis correctly included bias (mean difference of repeated measure) but should also report coefficient of variance (CoV = standard deviation of repeated measures as percent of their mean) or Bland-Altman coefficient of reproducibility, which are better known variability indexes than interclass correlation coefficient.

Moreover, reproducibility data are incomplete lacking mass, ejection fraction and stroke volume results and an intraobserver analysis.

6. R2 is not the same of Pearson’s correlation coefficient

7. At the end of 'Left ventricular stroke volume and ejection fraction’ section of Results: what does it mean “... a curvilinear decline .....from ~0.7 to ~0.6 with age.”?

8. In comparison to the study by Maceira et al., how do the authors explain the opposite trend through life of end-systolic volume and ejection fraction in female sex?

9. The relation between LV parameters and growth hormone/IGF levels is largely presumptive and not supported by data.

10. The paper needs a linguistic revision.


Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests: I have no financial or non-financial competing interests in relation to this paper.