Reviewer's report

Title: 3D Strain Helps Relating LV Function to LV Structure in Athletes

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Reviewer: Roxy Senior

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The article by Stefani et al evaluates the role of 3D strain (specifically the principal strain analysis) in understanding LV modification with physical exercise. The observational data is confined to a small and selected cohort of patients which has its own limitations and hence cannot be used to generalize across wider populations. The authors have not made it clear why BAV subjects were included? Is it because of higher prevalence of BAV disease in the population? Moreover, there is no data regarding the gradient across the aortic valve in these subjects. Table 1 suggests this group to have highest myocardial mass indexed. Is it due to outflow obstruction (even if mild) or due to aortic regurgitation worsening with exercise, which could be contributing to myocardial hypertrophy? Also there is no data regarding the pattern of hypertrophy in TAV or BAV athletes. Is it concentric or eccentric? This could affect the pattern of PSA in these subjects, as is shown in table 2 (GCS for BAV athletes is highest).

There are not TDI parameters for the population under study. This is important to look at LV filling pressures, as this could modify the strain pattern. If possible, diastolic parameters on exercise could be added to the analysis.

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: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

'I declare that I have no competing interests