Reviewer’s report

Title: Global peak left atrial longitudinal strain assessed by transthoracic echocardiography is a good predictor of left atrial appendage thrombus in patients in sinus rhythm with heart failure and very low ejection fraction - an observational study

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Reviewer: Iwona Swiatkiewicz

Reviewer's report:

Kurzawski et al performed this study to examine if global peak left atrial longitudinal strain assessed by transthoracic echocardiography (TTE) is predictive of left atrial appendage thrombus in transesophageal echocardiography (TEE) in patients with heart failure with reduced ejection fraction (HFrEF) and sinus rhythm. The authors provided an analysis of baseline echocardiographic data (TTE and TEE) and also prospectively collected long-term clinical data of 67 patients with HFrEF and sinus rhythm, and without history of atrial fibrillation or any established indication for anticoagulation. They demonstrate the predictive value of decreased global peak left atrial longitudinal strain assessed by TTE for left atrial appendage thrombus. Also, they observed no significant association between the presence of left atrial appendage thrombus in baseline TEE and the composite clinical endpoint of death or non-fatal stroke in the long-term follow-up with median observation period of 29.5 months.

Although this study covers an interesting issue and the rationale and scientific content are valuable, there are several important concerns that deserve special attention during revision. Specifically, all sections may need some rearrangements or improvements especially in terms of logical flow.

Major concerns:

1. The scientific writing requires further attention and some improvements because some statements can be made clearer (for example the sentence in lines 94-97 can be splitted in two sentences). Please try to write the text in more organized fashion and with better logical flow. It is difficult to read this manuscript which at times makes it also difficult to understand specific message or content. Also, please rectify the problem with inconsistent use of abbreviations (for example, the abbreviations "A4C" and "A2C" are used in line 131 without explanation).
2. In Abstract, the "Background" is too long while "Methods" and "Results" do not provide sufficient information on the methodology that was applied and the main results that were found.

3. The Background section of the manuscript is too long; it should be focused on the main topic of this manuscript. It also contains repetitive information in a few places. The missing references need to be provided (line 67, line 68, line 72, etc).

4. The Methods section needs improvement. The description of methods is insufficient and poorly organized. For example, the information about long-term follow-up is provided before the inclusion and exclusion criteria (line 111-112). I suggest to consider introducing primary (left atrial appendage thrombus) and secondary (composite clinical endpoint of death or non-fatal stroke) endpoints into the manuscript. There is no precise definition of long-term clinical endpoint in the current version of manuscript. There is different "definition" in the Methods (line 111-112: "all-cause mortality and hospitalizations due to ischemic stroke") compared with the Results section (line 202: "the composite endpoint of death or non-fatal stroke"). The echocardiographic methods that were applied in this study are relatively clear; however, because TTE and TEE were the primary modalities to evaluate global peak left atrial longitudinal strain and left atrial appendage thrombus, respectively, the process of echocardiography examinations would be very important. How many echo experts evaluated echocardiography examinations? Only one echo expert or more independent experts? How did they evaluate echocardiographic examinations: real-time or after stored in a digital format? Were TTE and TEE performed on the same day? If they assessed TTE exams offline, were they blinded to TEE findings?

I also suggest describing the methods in a few subsections (for example: study design, TTE with left atrial strain analysis, TEE etc.).

5. The investigators should provide the detailed and better organized description of the results including appropriate comments about the most important findings. To provide more logical flow, I suggest describing the results (including the comparisons between subgroups) in a few subsections. The data on univariate analysis and multivariable analysis need to be presented separately for both study endpoints, and also separately in tables.

There is no information about study flow. How many patients were screened and how many were excluded from this study? What were the indications for the hospitalization? Also, the investigators did not provide data on treatment (including antithrombotic treatment) that was applied in patients of both subgroups during the study period.
There are missing units in the tables. The title and content of the Table 2 are inconclusive in terms of the results of univariate analysis or multivariable analysis.

Figure 2 needs labeling.

6. The Discussion section also needs to be improved, for example it requires supplementing the references and the improvements with regard to scientific writing.

**Level of interest**

Please indicate how interesting you found the manuscript:

- An article of importance in its field

**Quality of written English**

Please indicate the quality of language in the manuscript:

- Needs some language corrections before being published

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