Reviewer’s report

Title: Area of the pressure-strain loop during ejection as non-invasive index of left ventricular performance: a population study

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Reviewer: Karolina Kupczynska

Reviewer's report:

I admire the authors' effort. The problem of precise evaluation of the impact of afterload on the heart function has an incremental clinical value. The way the paper is written is not clear for me in the methodology section.

- It is not clear even in the supplementary material: "The software was validated in 50 subjects using intermediate and final quality checkpoints and is available upon request from the corresponding author". Does it mean that there was no validation on the invasively checked pressure loops or invasive blood pressure measurements? It was only checked by the use of software on the already obtained data?

- It is not clear for me why only 54.4% patients with hypertension was treated (do you have access to the medical records of those patients, how was defined the definition of hypertension)

- Furthermore, adjusted EWD was significantly greater in both treated and untreated subjects with hypertension as compared to normotensive subjects. Could you explain it in discussion section - it is not clear for me.

- In my opinion you should performed detailed analysis for the correlation with antihypertensive drugs, ACE-I have different influence than diuretics, especially aldosterone antagonists

- The crucial thing in my opinion is the correlation of stiffness of the myocardium and the arteries. According to the new diastolic guidelines I have not seen the values of TRPG.

- Interesting may be a comparison of those parameters like EWD in patients according to the diastolic function (with regard to the guidelines of EACVI). Especially LAVi was three times bigger in women (in Parameter estimates)

- "EWD decreased independently with LV wall thickness in men, yet increased with higher LAVi and LV filling pressure (E/e' ratio) in women only" - could you explain why? The
increased thickness and LV filling pressure should increase the stiffness and fibrosis of the myocardium. Why there are opposite sex results? Influence of treatment, concomitant diseases?

- Could you explain why there is such big difference in adjusted EWD (Pa).

I recommend the paper for publication after major revision.

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