Reviewer's report

Title: Outcomes Associated with Comorbid Atrial Fibrillation and Heart Failure in Medicare Beneficiaries with Acute Coronary Syndrome

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Reviewer: Bradley G Hammill

Reviewer's report:

The authors used data from the Medicare Current Beneficiary Survey to examine the association of heart failure and atrial fibrillation with clinical events and costs in elderly patients who had a hospitalization for acute coronary syndrome. The found that heart failure was associated with substantially higher mortality and readmission in this population and that atrial fibrillation was associated with higher readmission, but not mortality. Unadjusted costs associated with HF and AF, compared to patients without the conditions, were also markedly higher.

Discretionary Revisions

(1) Because HF and AF are, themselves, highly linked comorbid conditions, it might be worthwhile and interesting in the analysis to separate out the patients having both conditions, if sample sizes permit. For example, Tables 1 and 2 could have 4 groups: (1) No AF or HF, (2) Both AF and HF, (3) AF only, (4) HF only; and the models could additionally include an AF-by-HF interaction term. This would enable the authors to report the effect of having both, without having to rely on only main effects.

(2) In Figures 1 & 2, if it is easier to talk about event (mortality, readmission) rates than survival (and event-free survival) rates, feel free to flip these curves around (1 – Survival).

(3) Did you do any sensitivity analyses to check the robustness of the HF and AF diagnoses? Given the importance of these conditions to the conclusions of the analysis, you may want to see if the results hold when you (a) require 2+ AF or HF diagnoses in the prior 6 months before you consider the patient to have the condition, or (b) require the AF or HF diagnosis to be on the index ACS hospitalization claim.

(4) Using the individual components of the CCI in regression models is typically preferable to including simply the CCI itself. I realize you may not have the sample size to do this, however, given that you include so many other socioeconomic variables (which is a real strength of this analysis, by the way). [Just a comment, really. No reply needed.]

Minor Essential Revisions

(5) In Figures 1 & 2, please label the X axes. I assume this is days following
index hospitalization.

(6) Please indicate in the methods how the cardiovascular-related hospitalization outcome was determined. What codes were used?

Major Compulsory Revisions

(7) In Figures 1 & 2, please report the number of patients in each group still at risk at various time points (e.g. given the current axis labels, every 200 days). It looks like there are very few patients left in the analysis past 1 year, yet having data out further than 1 year is one of the primary reasons given as a rationale for this study.

(8) You present the risk-adjusted associations of HF and AF with mortality and readmission, but why not present risk-adjusted associations with total overall costs as well? You have the data available and the correct model (log link, gamma errors) specified. Those adjusted cost ratios would be welcome information to have and would strengthen the manuscript.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**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