Author's response to reviews

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

Authors:

Shih-Yin Chen (shih-yin.chen@unitedbiosource.com)
Concetta Crivera (CCrivera@its.jnj.com)
Michael Stokes (michael.stokes@unitedbiosource.com)
Luke Boulanger (luke.boulanger@unitedbiosource.com)
Jeff Schein (JSchein@its.jnj.com)

Version: 2 Date: 14 November 2013

Author's response to reviews: see over
November 11, 2013

Christopher Morrey, BioMed Central
Executive Editor
BMC Health Services Research

Re: MS: 1824356122949013

Dear Dr. Morrey:

Thank you for your letter of October 15, 2013 regarding our manuscript entitled, “Outcomes Associated with Comorbid Atrial Fibrillation and Heart Failure in Medicare Beneficiaries with Acute Coronary Syndrome.” We were pleased to receive your reviewers’ comments, which we found very helpful. All revisions have been kept in track changes for easy identification. We have addressed the reviewers’ comments in the manuscript and/or as indicated below:

**Reviewer #1:** 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.

- Thank you for this suggestion and this would be an interesting analysis. However, the sample size is not sufficient to present the stratified results. The respective numbers of patients in the four cohorts are: (1) 545, (2) 54, (3) 52, and (4) 144. In addition, we are interested in understanding the average effect of one condition, independent of the other; therefore, we decided not to include interaction term into our models.

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).
• Thank you for the suggestion. We have made the change now presenting cumulative event rates.

(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.

• According to your suggestion, we further examined the claims of those patients to assess the frequency of claims with associated diagnosis. We found a very small proportion of patients (AF: 0.94%, HF: 2.02%) that we only observed one claim. We conducted a sensitivity analysis by eliminating the small number of patients with just one claim, and the regression results were consistent with the main analysis. Therefore, we feel our results are robust given the high specificity using a single claim to identify these comorbidities among the elderly ACS patients.

(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.]

• We chose to include the aggregated CCI score exactly for the reason that you mentioned (sample size).

Minor Essential Revisions

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

• We updated the figures to include a label for the X axes.

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

• We added the list of codes into an appendix.

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.
• We added number of patients at risk into the figures at annual time points.

(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.

• We ran the regression on costs as you suggested and included the results in Table 4.

Reviewer #2:

• Reviewer #2 provided no comments

On behalf of my co-authors, we thank the reviewers for their comments, which helped us to clarify some important points, and we thank you for the opportunity to respond. We hope that you will agree that our paper is now suitable for publication in *BMC Health Services Research*, and we look forward to hearing from you.

Yours sincerely,

Shih-Yin Chen, PhD
Research Scientist
Evidera