Reviewer’s report

Title: Gout is associated with a higher risk of Chronic Renal Disease in Older Adults: A Retrospective Cohort study of U.S. Medicare population

Version: 0 Date: 09 Aug 2018

Reviewer: Reviewer 2

Reviewer's report:

PEER REVIEWER COMMENTS: To view the full report from the academic peer reviewer, please see the attached file.

REVIEWER COMMENTS FROM REPORT: The study is interesting and important.

Strengths include the large representative sample and the inclusion of sensitivity analyses to provide further insights into the findings.

I do have some concerns, however, about the definitions and description of exposure and outcomes and additional confounding variables, which were not adjusted for.

REQUESTED REVISIONS: More information is required about the definition of chronic kidney disease (CKD) and its prior validation. How do ICD-9 codes map to the National Kidney Foundation stage 1-5 classification that is commonly used for research purposes and in clinical practice? In the National Kidney Foundation classification system, only stages 3-5 are considered to be clinically significant, so it is important to know whether CKD in this study, defined using ICD-9 codes, includes milder (stage 2) CKD, as this has significant implications for the clinical significance of the study findings and for comparing to the existing literature.

Did the confounding medications include angiotension II receptor antagonists, which associate with hyperuricaemia and gout in different ways (losartan being protective, others predisposing)? A further important confounder that is not considered is non-steroidal anti-inflammatory drugs, which are commonly used by people with gout and are an established risk factor for CKD. Confounding medications adjusted for in the analysis (cardiovascular medications, allopurinol, febuxostat) should be added to Table 1.

I find the description of predictor and outcome of interest on pg 4 (methods) confusing. As I understand the design, people who did and did not have gout (the exposure) were followed to compare the incidence of CKD (the outcome) between the exposed and unexposed groups. Yet on page 4, the predictor is said to be CKD and the outcome gout, which implies the opposite, that people with and without CKD were followed to compare the incidence of gout.
Similar confusion is seen in the first paragraph of the results, which makes a statement comparing the characteristics of people with gout versus those without, signposting Table 1, yet Table 1 compares people with and without incident CKD. Table 1 would be informative if it matched the text and compared those with and without gout at baseline (assuming that my understanding of the design outlined in the preceding point is true).

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

No

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

No

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

Not relevant to this manuscript

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable
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