Reviewer's report

**Title:** High Serum Bicarbonate Level within the Normal Range Prevents the Progression of Chronic Kidney Disease in Elderly Chronic Kidney Disease Patients

**Version:** 1  **Date:** 26 August 2012

**Reviewer:** Julia Scialla

**Reviewer's report:**

**Major Compulsory Revisions:**

1. The use of causal language is too strong throughout the manuscript given the observational nature of the data. I recommend revising the statements that high serum bicarbonate "decreased" or "prevents" CKD progression.

2. I would like more information on the creation of the study population. The authors indicate that all participants had at least 2 years of follow-up (i.e. no deaths or other losses to follow-up in this period). This is unusual in clinical studies when losses to follow-up inevitably occur. Was 2 years of follow-up compulsory for inclusion in the study population? If so, this should be clearly discussed in the methods section and may be source of bias. A flow diagram may be helpful.

3. Differential rates of follow up in the two groups reported in Table 1, and "+" marks in Figure 2, suggest that censoring was present after 2 years and was much more common in the control group. The authors should discuss the reasons for these censoring events. Were deaths more common in the control group?

4. Due to the presence of censoring (Comment 3), Cox models are the most appropriate method of analysis and logistic regression models are problematic. I would favor eliminating logistic models and Figure 1 and focus on the survival analysis which is more appropriate to the data type.

**Minor Essential Revisions:**

5. The discussion mentions many other large studies with similar results. Can the authors discuss what this study adds to the others besides consistency?

6. The authors indicate that no side effects of serum bicarbonate were noted. How did the authors assess for side effects and what side effects were specifically ascertained? Given the retrospective nature of this study, I suspect that detailed ascertainment of side effects could not be performed and I would recommend removing this statement.

7. In Table 1, it would help to indicate mean +/- SD to differentiate from n(%)
8. In Table 2, it is preferable to label the column with a more descriptive term, such as "difference in serum bicarbonate", as opposed to beta.

9. In Figure 2, it is preferable to add a risk table below the Kaplan Meier graph to show the sample size in each group over follow-up.

Discretionary Revisions:

10. The analysis using propensity score does not seem to add much to the multivariable models. The propensity score involves only 3 variables and does not include many that probably are important in serum bicarbonate level but not significant due to sample size. The propensity model still involves substantial multivariable adjustment. I would consider removing this section.

11. The study population includes a mix of participants on sodium bicarbonate supplementation (approximately 20%) versus not. These two groups address a slightly different question and it may be useful to stratify by this factor or restrict to a purely untreated group.

12. The discussion of references 20 and 21 may be somewhat incorrect and should be reviewed. For reference 20, I believe this study indicates that for a given net acid excretion, urine pH must be lower in older adults suggesting inefficiency in acid excretion but not necessarily that net acid excretion is out of pace with intake. I am unsure of the meaning of the statement regarding ref 21 given that metabolic acidosis and retention of hydrogen ions are essentially synonymous.

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests.