Reviewer's report

Title: Low urine pH and acid excretion do not predict bone fractures or the loss of bone mineral density: a prospective cohort study

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Reviewer: Jane Kerstetter

Reviewer's report:

The study reports the relationship, or the lack of, between ph of fasting urine and calculated acid excretion and change in BMD and fragility fractures in a large group of Canadian adults over the age of 25 y. The research question addressed by this study is important and timely from a public health perspective.

Major concerns

1. One always worries about a type 2 error when there are negative results such as in this study. This worry has lead us, as scientists, to publish an over representation of papers with a positive bias. Nonetheless, it remains a worry. Can the authors work in a positive control or some way of validating their measurements. For example, was there any dietary data collected on the subjects, so that dietary protein may be related to an indicator of acid generation.

2. Is the measurement of urinary pH accurate given the samples were not collected under mineral oil? This problem may be worsened by the fact that these were only 2 h urines after an overnight fast, and not 24 h. (Oster, J. R., Lopez, R., Perez, G. O., et al. 1988. The stability of pH, PCO2, and calculated [HCO3] of urine samples collected under oil. Nephron 50: 320-4.) The authors attempt to address this on page 9, para 2. I'm not clear on what the authors call 'misclassification errors' since ph was used as a continuous variable.

Minor

Table 2. Reporting urine values per unit of volume (L) makes little sense because it is so dependent on hydration status.

Discretionary

Abstract

Background: The 2 sentences should be more focused/scientific and less general.

Background

Para 2. All the references to the lay, internet books, sites is not particularly helpful and not commonly done in research manuscripts, since there will be lay literature that claims almost anything. Perhaps that info is better suited for the "Discussion" section.

Para 3. If the 24 h urine is collected under mineral oil the loss of the volitiles are
significantly reduced.

Methods

Page 5, para 2. It should be made clear that the 'estimated acid excretion' was calculated from the 2 h urines by measuring actual components of that 2 h urine. . . sulfate, chloride, phosphate etc. Is the 'estimated acid excretion' ([sulfate + chloride + 1.8 x phosphate + estimated organic acids (36)] – [potassium + sodium + 2x calcium + 2x magnesium] in mmol/L) equal to the indirect measurement of NAE?

Discussion

Page 8, Para 1. Many of the references sited that support the acid ash hypothesis involved the pharmaceutical manipulation of pH, which should be considered as very different from altering dietary components. It is also not necessary to criticize reference 13’s study design.

Table 1. Does "Vitamin D Status" refer to serum vitamin D?

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.