Reviewer's report

Title: Urine alkalization facilitates uric acid excretion.

Version: 1 Date: 2 June 2010

Reviewer: Scott E Liebman

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Urine alkalization facilitates uric acid excretion.
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My comments are as follows:

Major Compulsory Revisions

1. Reporting uric acid excretion as mg/g of creatinine may be misleading. The authors’ assertion that creatinine concentration in the serum remains the same may be misleading. Protein loading may increase the GFR, which would lead to an increase in creatinine excretion until a new steady state is achieved. Reporting the total uric acid excreted would eliminate this problem. If not, this possibility should be acknowledged, unless the investigators can provide clear data that creatinine steady state will be reached by the day when measurements were made (which I assume is after day 5, but should be clarified.)

2. There is no mention of uric acid concentration in the blood. The authors start the paper by discussing the adverse consequences of hyperuricemia, but no mention of the uric acid concentration in the serum. If possible, the authors should include these data, or at least an estimate of what magnitude of uric acid decrease can be expected from the increased excretion.

3. The last sentence in the manuscript states that “it is quite reasonable to speculate that gout is due to inevitable maladaptation of the renal function to the change in the contemporary diet”. It is not clear to me what this means. This seems like a sweeping statement which needs some further explanation. Why is gout due to the “maladaptation of the renal function”, and not the change in diet per se. This needs to be clarified.

Minor Essential Revisions

1. It needs to be made clear up front that this is a crossover study. This is not immediately obvious.

2. In the introduction, the authors assert that pharmacologic approaches to gout are always accompanied by side effects. Clinically, these medications seem to be relatively well tolerated, and while there may be side effects associated with their use, this is hardly universal. The point that alternative ways to improve uric acid excretion would be helpful is valid, but I do not think the clinical experience backs up such a strong assertion.

3. The urine pH is certainly key to whether or not uric acid stones precipitate. It is
not clear why the authors mention uric acid urolithiasis. It is known that diets high in acid lead to more uric acid stones; however this paper was not designed to assess that. The authors should either further expound on the protective effect of an alkali diet on uric acid stones, or eliminate any discussion on this topic.

4. Figure two needs a key as to what the shapes mean (as was done in figure 3).

5. In the discussion is stated that uric acid excretion increases exponentially with increasing pH. The equation, however, is linear, not exponential.

6. There are some colloquial phases, i.e. “As a matter of fact” “By the same token”. These should be avoided.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**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