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Author Reply

Noah E. Canvasser

Marcelino Rivera

Seth K. Bechis

Johann Ingimarsson

John Knoedler

See next page for additional authors

Authors

Noah E. Canvasser, Marcelino Rivera, Seth K. Bechis, Johann Ingimarsson, John Knoedler, Karen Stern, Christa L. Stoughton, Daniel Wollin, Michael Borofsky, Naeem Bhojani, Marawan El Tayeb, Guido Kamphuis, David Leavitt, Ryan S. Hsi, and Kymora B. Scotland

Over all, this study is well done; however, a strong conclusion will not be drawn given the lack of rigid dietary control and a small number of studied subjects. Due to the latter circumstances, the lack of significant increase in urinary citrate despite a significant rise in urinary pH, and a significant fall in urinary ammonium with LithoLyte, and conversely, the effect of KSPtabs in a significant rise in urinary citrate and urinary pH without a significant fall in urinary ammonium could not be fully explained.

The heterogeneous biochemical response with these 2 alkali preparations to a major extent is due to different amount of alkali delivered by 2 products. The alkali delivered by the 2 preparations differed by 9.5 mEq/day. Therefore, this difference in addition to lack of dietary control and a small sample size, have greatly affected the result and requires to be fully investigated in the future. Moreover, urinary potassium with both LithoLyte and KSPtabs, did not change significantly suggestive of either lack of compliance to the drug or due to diarrhea loss of potassium.

With regard to the side effects, both these preparations as well as previous studies in recurrent calcium oxalate stone formers by Ettinger et al. [2] and by Barcelo, et al in hypocitraturic calcium stone former, [3] showed similar minor gastrointestinal side effects including mild nausea, epigastric pain or abdominal distension. Although the dosage of alkali used in Ettinger and Barcelo studies was higher than this study [1] using 63 mEq/day of potassium magnesium citrate and 45 mEq/day potassium citrate, respectively. Thereby, no definitive conclusion can be made with the present study that LithoLyte and KSPtabs supplements would offer a more protective role with the gastrointestinal adverse effects.

It must be acknowledged that this is the first step toward the development of over-the-counter alkali therapy for the kidney stone formation concerning side effects, tolerability, and cost.

However, due to the deficiency in the design comprehensive studies under metabolic regimen using these alternative over-the-counter alkali supplements, must be performed in kidney stone forming population to overcome the limitation of this study. I feel until that time the AUA guidelines [4] recommended potassium citrate as the primary alkali therapy for kidney stone formers must be followed by urologists and nephrologists involved in management and care of this population.

Sakhaee Khashayar, Charles and Jane Pak Center of Mineral Metabolism and Clinical Research Department of Internal Medicine, University of Texas Southwestern Medical Center Dallas, Texas

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Reply by authors:

We appreciate the thoughtful critique of this manuscript by the author of the editorial. The purpose of this study was not to show that these over-the-counter alternatives are as effective as potassium citrate; we did not have a control group on potassium citrate. Rather, we tested whether these commonly used alkali supplements actually change urine parameters in healthy subjects.

Online shopping has empowered patients to look for alternative therapies due to potassium citrate cost, side effects, pill size, and/or desire for a "natural" approach. While dozens of options exist, the endourology community needs to study these therapies so that patients are able to choose effective options based on science, not star ratings and online reviews.

Studying alkali alternatives in a small sample size is not novel. Twelve patients were given 2L of lemonade with significant improvements in urine citrate,[1] which continues to be 1 of the most common adjunctive therapies used. Thirteen subjects on a metabolic diet were studied to show that orange juice is a superior alkali compared to lemonade.[2] And 8 patients demonstrated the benefit of coconut water consumption due to the alkali effect of high malate intake.[3] Certainly, our 10-subject study with varied alkali loads between supplements on self-controlled diets is a limitation. While we were not directly comparing 1 supplement to the other, we chose to maintain a similar dosing frequency for consistency despite the alkali loads. In addition, given the lower potassium citrate content of these preparations compared to pure potassium citrate, we might not see a robust urinary potassium response. Any patient started on alkali therapy should be monitored with 24 hour urine studies to ensure efficacy. We will further study 24 hour urine parameters in an at-risk study population.

We are indebted to Dr. Sakhaee et al. at the Charles and Jane Pak Center for Mineral Metabolism and Clinical Research at UT Southwestern, whose work on nephrolithiasis pathophysiology and prevention is the foundation for much of what we do. Products continue to be developed for kidney stone prevention, many within our own community. As stewards of preventative therapy, we need to study and be critical of these options in order to better guide our patients.

Noah E. Canvasser, Marcelino Rivera, Seth K. Bechis, Johann Ingimarsson, John Knoedler, Karen Stern, Christa L. Stoughton, Daniel Wollin, Michael Borofsky, Naeem Bhojani, Marawan El Tayeb, Guido Kamphuis, David Leavitt, Ryan S. Hsi, Kymora B. Scotland, for the Collaborative for Research in Endourology (CoRE).
Department of Urology, University of California Davis, Sacramento, CA; Indiana University, Indianapolis, IN; University of California San Diego, San Diego, CA; Maine Medical Center, South Portland, ME; Penn State University, Hershey, PA; Mayo Clinic, Phoenix, AZ; Brigham and Women's Hospital, Boston, MA; University of Minnesota, Minneapolis, MN; University of Montreal, Montreal, QC, Canada; Baylor Scott and White Health, Temple, TX; Amsterdam University Medical Center, Amsterdam,

Netherlands; Henry Ford Health System, Detroit, MI; Vanderbilt University Medical Center, Nashville, TN; University of California Los Angeles, Los Angeles, CA

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