STONE DISEASE

Climate-related increase in the prevalence of urolithiasis in the United States

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An unanticipated result of global warming is the likely northward expansion of the present-day southeastern U.S. kidney stone "belt." The fraction of the U.S. population living in high-risk zones for nephrolithiasis will grow from 40% in 2000 to 56% by 2050, and to 70% by 2095. Predictions based on a climate model of intermediate severity warming (SRESa1b) indicate a climate-related increase of 1.6-2.2 million lifetime cases of nephrolithiasis by 2050, representing up to a 30% increase in some climate divisions. Nationwide, the cost increase associated with this rise in nephrolithiasis would be $0.9-1.3 billion annually (year-2000 dollars), representing a 25% increase over current expenditures. The impact of these changes will be geographically concentrated, depending on the precise relationship between temperature and stone risk. Stone risk may abruptly increase at a threshold temperature (nonlinear model) or increase steadily with temperature change (linear model) or some combination thereof. The linear model predicts increases by 2050 that are concentrated in California, Texas, Florida, and the Eastern Seaboard; the nonlinear model predicts concentration in a geographic band stretching from Kansas to Kentucky and Northern California, immediately south of the threshold isotherm.

Editorial Comment

This novel study raises important concerns and provokes many unique avenues for future investigation. It is ironic that as the polar ice melts, and water levels rise, we may need this water to prevent kidney stone disease!

In developed countries, we live in climate-control; ambient temperature set at 65 or 70 degrees F, irrespective of time of season. The health risk posed by rises in mean annual temperature (MAT) and heat index will be felt heaviest by those with occupations that demand a significant time outdoors (agriculture, construction etc.) The risks of global warming on stone formation will be more acutely felt by those living in areas not fortunate to have air-conditioning.

The authors note that heat stress and heat index may have a closer link to the distribution of the stone belt than MAT. As scientists debate the "positive water vapor feedback" that links humidity with global warming, it will be important to consider this for stone risk projections. In addition, the interplay between vitamin-D metabolism, stone risk and atmospheric changes deserves further study.

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Accuracy of urinary dipstick testing for pH manipulation therapy

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Purpose: To determine the accuracy of urinary dipstick testing for pH manipulation therapy.
Materials and Methods: Three commercial brands of dipstick paper were used to measure the pH of 100 fresh urine specimens from patients with urologic diseases. These were all read by an experienced medical technician. The pH of these specimens was also measured with an electrochemical pH meter ("gold standard") performed by another experienced technician. Both were blinded to each other's results. The influence of urinary microscopic findings was also assessed. Student t test and analysis of variance were used to analyze the data.
Results: The accuracies of the dipsticks for determining pH were as follows: 54.8% to 92.8% for less than 6, 45% to 97.5% for 6 to 7, 72.2% to 83.3% for greater than 7. One of the dipsticks assessed had the lowest accuracy for all three ranges. There was a statistically significant difference between the performances of the other two as compared with the least accurate one. There were no statistically significant differences between the two more accurate dipsticks. Urinary microscopic findings and other dipstick results did not influence results.
Conclusion: The targeted pH range for urinary pH manipulation therapy is 6 to 7. These results indicate that dipstick testing may be applicable to monitor patients on pH manipulation therapy and modify treatment when necessary. The accuracy of the device used for this purpose, however, must be determined before use.

Editorial Comment

The authors conducted a well-designed and elegant evaluation of an important question that impacts clinical practice. This study evaluated trained medical technicians - it would be critical to evaluate the ability of the patient to correctly read the urine pH using a dipstick, as this strategy is best suited for home-monitoring. Monitoring pH levels over 7 is of particular importance to avoid increasing the risk of calcium phosphate crystallization, and as such, the litmus paper proved superior in this regard. Similarly, the litmus paper was most accurate at providing "positive feedback" in the face of a therapeutic pH of 6-7. The authors plan to evaluate a handheld pH meter accurate to within 0.1 pH units for home therapy that costs less than $100. The authors recommend checking the urinary pH three times a day during initial titration of therapy.

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ENDOUROLOGY & LAPAROSCOPY

Risk score and metastasectomy independently impact prognosis of patients with recurrent renal cell carcinoma

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Purpose: We evaluated the prognostic roles of metastasectomy and an established risk stratification system in patients with disease recurrence following nephrectomy for nonmetastatic renal cell carcinoma.
Materials and Methods: A retrospective analysis was performed in 129 patients with localized renal cell carcinoma treated with partial or radical nephrectomy and subsequently diagnosed with disease recurrence. At