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Monosodium Urate Stones Are Rare, and Urine pH Is Not Low in Cystinuria

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To the Editor

In the February 2013 Quiz Page “Rapidly Recurrent Nephrolithiasis,” Table 1 lists “3 Major Uric Acid–Related Radiolucent Stones”: ammonium urate, monosodium urate, and uric acid.¹ Monosodium urate is almost never an important component of kidney stones and is rare even as a minor component. To demonstrate this point, we collated results of some of the major series reporting kidney stone composition (Table 1). It is evident that stones composed of monosodium urate are exceedingly rare; it is infrequent even as a minor component. We also reviewed kidney stone composition from the Department of Urology at the University of Wisconsin. Of 1,642 kidney stone analyses, there were 2 that included monosodium urate, which constituted 85% of one and 3% of the other.

It also is worth noting that monosodium urate is not an important contributor to the formation of calcium oxalate stones. Uric acid, not monosodium urate, reduces the solubility of calcium oxalate,¹⁴ which explains the ability of urate-lowering therapy with allopurinol to reduce the recurrence of calcium oxalate stones.¹⁵

In discussing cystine stone formation, the authors state that cystine crystals form in acidic urine, and that the urine pH of the patient they presented, 6–6.5, made cystine stones unlikely. Although cystine solubility is pH dependent, significant increases in solubility do not occur until urine pH reaches 7.0.¹⁶ Because cystine stone formers tend to have higher urine pH than healthy individuals,¹⁷ most patients with cystinuria have urine pH around 6.5 when forming stones.

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Table 1
Monosodium Urate Stones in the Literature

	No. of Stones			Method
	Analyzed	With >50% NaHU	With <50% NaHU	
Largerren ²	600	0	1 ^a	X-ray diffraction
Ansari et al ³	1,500	0	0	X-ray diffraction
Nordin & Hodgkinson ⁴	269	0	0	Not reported
Sutor et al ⁵	856	0	3	X-ray diffraction
Leusmann et al ⁶	5,035	1	4	X-ray diffraction
Minon Cifuentes & Pourmand ⁷	103	0	1 ^b	Infrared spectroscopy
Pak et al ⁸	1,392	0	0	Various (done by various clinical laboratories)
Daudon et al ⁹	10,617	11	66	Optical microscopy + infrared spectroscopy
Koide et al ¹⁰	2,724	0	0	Infrared spectroscopy
Mandel & Mandel ¹¹	10,163	8	2	X-ray diffraction
Prien ¹²	1,000	0	0	Optical microscopy + x-ray diffraction
Herring ¹³	10,000	4	33	Optical microscopy ± x-ray diffraction
Unpublished ^c	1,707	1	1	Not reported
Total	45,956	25 (0.05%)	115 (0.2%)	

Abbreviation: NaHU, monosodium urate.

^a Bladder stone.

^b Minor component in “ectopic ossification” in the kidney.

^c Data from the University of Wisconsin Department of Urology.