

J. Clin. Chem. Clin. Biochem.  
Vol. 26, 1988, pp. 653–654  
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Berlin · New York

## Letter to the Editor

### Calcium Oxalate Crystalluria, a Curiosity or a Diagnostical Aid?

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(Received June 13, 1988)

Sir,

In clinical chemistry laboratories the routine examination of the urinary sediment is frequently performed. The examination of the urinary sediment however is time-consuming and not very reliable (1, 2). An alternative was found in a multiple reagent test strip, which, by incorporating a leukocyte esterase and a nitrite pad, provided a basis for a screening protocol for pathological urinary sediments (3–6).

Despite all benefits, these test strips are unable to detect urinary crystals, in contrast with the examination of urinary sediment.

Several authors consider crystalluria (prevalence = 17%) as an invalid finding, while others point out its relevance for the diagnosis of renal stone disease or the follow-up of its treatment (7–9).

Stone-forming crystals, predominantly calcium oxalate, could be considered as the only crystals worth looking for in routine sediment examination. Other types of crystals are either diagnostically unimportant or extremely rare.

In order to determine the diagnostic value of calcium oxalate crystalluria we examined the urinary sediments of 148 known renal stone formers and 144 controls (without anamnestic predisposing factors for renal stone disease) for the presence of urinary crystals.

In our study, in order to create a normal situation, renal stone formers were asked to interrupt their (preventive) increased fluid intake during 24 hours before voiding for examination. All controls were advised to avoid food containing large amounts of oxalate e. g. spinach and rhubarb.

#### *The urinary sediment examination:*

All sediments were investigated in the morning within one hour after voiding, in order to decrease the in vitro formation of crystals.

Homogeneous urine (10 ml) was centrifuged at 580 g for 10 min, and the supernate decanted. The remaining specimen was shaken and homogenised again. A single drop was applied to a slide and covered. At

magnification 400 x, 20 fields of each sediment were examined. If crystals were present, the crystal type and number were registered. In addition, the creatinine concentration in the urine was measured in order to estimate the urine dilution.

Urinary crystals were seen in 48 out of 292 sediments (16.4%). Calcium oxalate was the predominant crystal. The occurrence of calcium oxalate crystals is shown in the table. There was no significant difference between patients and controls (*Fisher's* exact test:  $p = 0.46$ ). The diagnostic value was low: the sensitivity was 11.5%, the specificity was 89.6% and the likelihood ratio was 1.1.

Frequencies of calcium oxalate crystals in urinary sediments for patients and controls.

	Patients	Controls	
Crystals present	17	15	32
Crystals not present	131	129	260
	148	144	N = 292

The mean creatinine concentration in the urine of the patients and the controls was 15.5 mmol/l (SEM = 7.3) and 17.0 mmol/l (SEM = 7.4), respectively. The difference in concentration of the urine between both groups was not significant (*Student's* t test:  $p = 0.15$ ).

Considering the results of our study, the following should be noted: Our patients were predominantly men and of higher age than the controls. The incidence of renal stone disease increases with age and is higher in males than in females (10). Hence a significantly higher number of crystal-containing sediments could be expected in our patients.

However, we found no significant difference. Moreover, stratification showed that age as well as sex-ratio had no influence on our results (*Fisher's* exact test:  $p$  varied between 0.11 and 0.61).

Based on these results, it is our opinion that calcium oxalate crystals in the routine urinary sediment are clinically unimportant. The diagnostic value of their presence is too small to select stone formers from the open population.

In view of these results, it is not necessary to discontinue the use of multiple reagent test strips as a screening procedure.

In our opinion the examination for urinary crystals keeps its value in specific examinations e. g. the diagnosis of cystinuria. In most instances, however, crystalluria is nothing more than a curiosity.

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