The importance of recognizing whewellite

Nandi J. Reddy¹, Arief A. Suriawinata² and Martin Sedlacek³

¹Department of Pharmacology, ²Department of Pathology and ³Division of Nephrology, Dartmouth Hitchcock Medical Center, Lebanon, NH, USA

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An 81-year-old man was found lying on the ground outside his home. He was comatose and hypothermic. He had a severe metabolic acidosis with elevated anion and osmol gaps, and his plasma ethylene glycol level was 3180 mg/l. The urine sediment showed calcium oxalate monohydrate crystals (Figure 1). Due to prolonged exposure, the patient died despite treatment.

Survival of ethylene glycol intoxication depends on the rapidity of diagnosis and treatment. If recognized, urinary calcium oxalate crystals may provide an important diagnostic clue. They exist in two forms. Best known are the envelope-shaped dihydrate crystals named weddellite after their first discovery in Antarctic Ocean sediment (Figure 2). The rod-shaped monohydrate crystals named after the British scientist William Whewell (1794–1866) are less recognized, and several monographs on urinalysis do not mention their existence [1–4]. In ethylene glycol intoxication urinary calcium oxalate crystals are usually in the latter monohydrated form (Figure 1), the timely recognition of which may be life-saving.

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References

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Correspondence and offprint requests to: Martin Sedlacek, MD, Assistant Professor, Division of Nephrology, Dartmouth Hitchcock

Fig. 1. Monohydrated calcium oxalate urine crystals ‘whewellite’ after ingestion of ethylene glycol.

Fig. 2. For comparison: dihydrated calcium oxalate crystals ‘weddellite’ in urine from a healthy individual.