Nephroquiz (Section Editor: M. G. Zeier)

Apricot urine in autumn

Nephrologists in medieval times had a pretty good time of it. They examined their patients’ urine by placing the liquid in a matula (glass receptacle). They then held the matula up to the light. The urine was judged in terms of its colour and turbidity. Subsequently, nephrologists have fallen onto harder times. The specialty today is held in less high esteem, although we can now actually do something for the patients. Nephrologists no longer rely on the matula. However, since the times of Thomas Addis and other pioneers, no physical examination is said to be complete without the doctor looking at the patient’s urine, grossly and under the microscope [1]. Our patient’s urine was revealing in that regard, even without the microscope.

Case

A 69-year-old woman was referred to our service because of vertigo. The attack was sudden and was accompanied by nausea and vomiting. She had never experienced such symptoms before. She was diagnosed as hypertensive 12 years earlier and had an elevated cholesterol level. Her gall bladder had been removed because of cholecystitis. She had also undergone several gynaecological and orthopaedic operations. Her renal function had always been normal. Specifically, she had never had stone disease or arthritis.

Her physical examination was unremarkable. Her blood pressure was well controlled, her cardiovascular and pulmonary examinations were normal, she had no abdominal findings, no signs of joint disease, no nodules or tophi, and no peripheral oedema. Her blood counts, electrolytes, enzymes, and a host of other laboratory tests were either unremarkable or consistent with her known conditions. The urine pH was 5.0, the protein, glucose, and ketones were negative. Her creatinine concentration was 70 μmol/l, the urea concentration was 6.9 mmol/l, and the uric acid level was 383 μmol/l. The latter value is at the upper limits of normal for a lady her age.

After completing her neurological examination and examining her gait and station, we made the diagnosis of probable positional vertigo. The appropriate manoeuvres were applied and her symptoms promptly resolved. Thereafter, we got to the part that Addis designated as absolutely essential, examining her urine. We placed 10 ml into a test tube and centrifuged the turbid, but otherwise unremarkable urine at 3000 r.p.m. for 10 min. To our surprise, the tube showed an apricot coloured precipitate as shown below (Figure 1).

Question

Can you make the diagnosis by merely a glance, as a medieval nephrologist would surely have done?

Fig. 1. Apricot coloured resuspension of the urinary sediment after centrifugation at 3000 r.p.m. for 10 min.
Answer to the question on the preceding page

The urinary sediment was revealing (Figure 2). In the photomicrograph under phase contrast, we observed beautiful rhomboid crystals consistent with uric acid [2]. Subsequently, we added a few drops of potassium hydroxide to the precipitate in the test tube and the apricot-coloured material disappeared immediately. Merely shifting the pH from 5 to 6 increases the solubility of uric acid in urine 1000-fold, allowing the material to go back into solution.

Uric acid is the end product of purine metabolism and is freely filtered by the glomerulus. Uric acid is reabsorbed in the proximal tubule. The urate clearance is ~10% of the creatinine clearance. The long suspected urate transporter in human kidney has recently been cloned [3]. Men and women excrete 500–800 mg of uric acid per day. Precipitation of uric acid in concentrated acid urine is nothing unusual and is not of pathological significance. Our patient, after all, was entirely asymptomatic. However, the ‘pink precipitate’ phenomenon is important and clinicians need to be aware of it. For instance, apricot coloured or ‘pink urine’ in morbidly obese patients following gastric partitioning has been described [4]. On the day following gastric partitioning, clinicians caring for the patients observed that their urine was commonly pink and that a pink precipitate formed on their post-operative urinary drainage tubes. Microscopy showed the same crystals we describe here. A prospective evaluation was then performed on 187 obese patients undergoing gastric partitioning. Postoperative ‘pink’ urine was observed in 32% and in none of a thin control collective operated upon for other reasons. The obese patients had serum uric acid levels in the high-normal range. However, their urate clearance was relatively high and their urine was acid. The finding was of no clinical consequence. The phenomenon is also known in infants and children, who have a higher uric acid clearance and a higher uric acid excretion than adults, when expressed as mg per kg body weight [5]. Needless to say, pink urine can be of great concern to young mothers.

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References


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