

Communication and ciprofloxacin-associated acute kidney injury

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Case

A 61-year-old man was transferred from a rural hospital for investigation and management of anuric acute kidney injury. His medical history included recurrent unprovoked deep vein thrombosis, hyperlipidaemia, alcohol use (3–4 cans of beer/day) and gastritis. His usual drugs were apixaban, fenofibrate and pantoprazole.

Two weeks before presenting to the rural hospital, the patient was prescribed ciprofloxacin for a urinary tract infection with *Pseudomonas aeruginosa*. At the time of dispensing he was advised to take the ciprofloxacin 'on an empty stomach'. In response to this advice, the patient decreased his overall daily intake to occasional toast and 3–4 cans of beer. At this time the patient also developed twice-daily watery stools, but he adhered to what he understood to be a food and fluid restriction and continued taking his medicines.

The patient presented to the rural hospital following a fall, complaining of abdominal distension and diarrhoea. Initial observations and investigations found that he was haemodynamically stable with acute kidney injury (serum creatinine over 500 micromol/L) and decreased urine output. The anuria persisted despite fluid resuscitation so the patient was transferred to a specialist centre where his renal function slowly recovered.

Comment

The cause of acute kidney injury in this patient may have been multifactorial, including dehydration from decreased oral intake, diarrhoea and ciprofloxacin-induced nephrotoxicity. Case reports of ciprofloxacin-induced acute kidney injury have proposed multiple mechanisms, including interstitial nephritis, rhabdomyolysis or crystallisation within the renal tubules causing intra-renal obstruction.

A US study found that in men aged 40–85 years old current fluoroquinolone use (at the time of admission, or within seven days) had a 2.18-fold (95% confidence interval 1.74–2.73) higher relative risk of acute kidney injury compared with patients prescribed amoxicillin and azithromycin. This risk was not associated with recent use (prescription completed 8–60 days previously) or past use (>60 days previously).¹ However, the absolute increase in acute kidney injury was low with only one additional case per 1529 patients, or per 3287 prescriptions dispensed.

According to the Australian Medicines Handbook ciprofloxacin should be taken either one hour before or two hours after meals and patients should drink plenty of fluids. This is because the drug's absorption is decreased when it is taken with metallic compounds (notably calcium, iron and aluminium),² and due to reports of acute kidney injury from ciprofloxacin-induced crystalluria.

The patient recalled being informed that ciprofloxacin should be taken on an empty stomach, but not about the timing of food intake or the importance of hydration. The decrease in oral intake, coupled with diarrhoea, contributed to volume depletion and the onset of acute kidney injury.

Recommendation

Clear and patient-centred communication reduces misunderstanding and confusion and improves adherence. Patient education is key in this process and may include both verbal and written information. An explanation of why ciprofloxacin is taken separately from food, but not water, may have helped in this case.

Darren Roberts is Chairman of the Editorial Executive Committee of Australian Prescriber.

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