

Eardrop attacks: seizures triggered by ciprofloxacin eardrops

Clinical record

A 65-year-old woman had recurrent generalised tonic-clonic seizures. She was being treated with peritoneal dialysis for chronic renal failure caused by a combination of agenesis of the left kidney and focal sclerosing glomerulonephritis. Other medical problems included mixed connective tissue disease, ischaemic heart disease, Raynaud's phenomenon, anaemia of chronic disease, asthma, hypertension and chronic bilateral serous otitis media (treated with tympanostomy tubes). Her regular medications included atorvastatin, alendronate, perindopril, aspirin, allopurinol, ranitidine, doxepin, controlled release morphine sulfate, ferrous sulfate, calcium carbonate, frusemide, prednisolone, and diltiazem. Intermittently she had been given erythropoietin (a seizure precipitant)¹ for her anaemia. She developed a rash when taking cephalosporins, and had a sister who had primary generalised epilepsy.

The seizures continued despite cessation of the erythropoietin therapy and administration of sodium valproate. Magnetic resonance imaging of the brain and electroencephalography gave normal results.

Meticulous medication review eventually revealed the coincidence of seizures with the intermittent prescription of ciprofloxacin eardrops. Eight of the nine seizures occurred while taking Ciproxin HC Ear Drops (ciprofloxacin 2mg, hydrocortisone 10mg; Alcon Laboratories, Sydney) for otitis media (Box). The ciprofloxacin eardrops were neither recorded on admission nor listed by the patient on direct questioning about medications she was taking. She has had a seizure-free period of 9 months after cessation of the eardrops, despite tapering of the dose of sodium valproate. The ciprofloxacin eardrops are considered the probable cause of the seizures in this case, according to the Naranjo algorithm for estimating causality of an adverse drug reaction (score, 8).²

Lessons from practice

- Topical medications can produce systemic effects.
- Fluoroquinolones may trigger seizures by any route of administration.
- A thorough drug history is necessary in assessing patients with complex medical problems.
- Eardrops are a frequent omission from medication histories.

ance of less than 30 mL/min.⁵ There are reports of seizures after enteral and intravenous administration of ciprofloxacin,⁶ but, to our knowledge, this is the first report of seizures with ciprofloxacin eardrops. The recurrent seizures were believed to be due to the combination of an epileptogenic predisposition, renal failure, and intermittent ciprofloxacin use, with absorption facilitated by the bilateral tympanostomy tubes. Topical medications can produce systemic effects and this should be considered, particularly when other factors favour systemic absorption. A thorough drug history is necessary in assessing patients with complex medical problems taking multiple medications.

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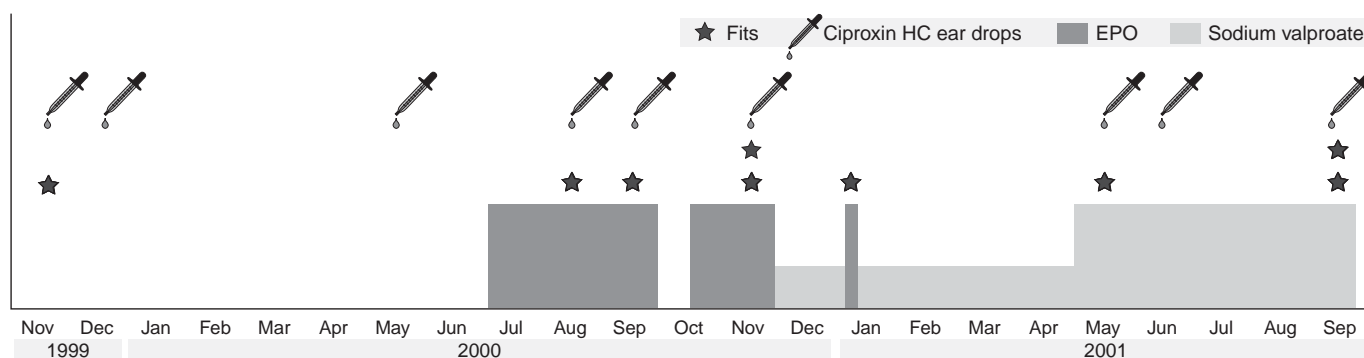
Competing interests: None identified

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POLYPHARMACY in complex medical patients frequently causes adverse effects.³ Up to 26% of prescription drugs are not recorded at the time of hospital admission,⁴ and eardrops are a common omission from medication lists. Ciprofloxacin is a fluoroquinolone antibiotic that inhibits bacterial replication. It is thought to lower seizure threshold by reducing γ -aminobutyric acid (GABA) transmission. Ciprofloxacin is excreted renally and has a half-life of 2.9–4.3 hours, which doubles in end-stage renal failure. Dose reduction is advised when patients not receiving dialysis have a creatinine clear-

Chronological sequence of seizures and medication



The period during which the patient had seizures (★) related to receiving ciprofloxacin eardrops (dropper), erythropoietin (EPO) for anaemia in chronic renal failure, and increasing doses of sodium valproate. (We thank Heidi Cartwright for preparing the diagram.)