later myoclonic jerking began in her arms; she felt frightened, and had episodes of panic. A nocturnal tonic-clonic seizure followed 48 hours after the last dose. Her family doctor gave her an anticonvulsant and referred her to the neurology outpatient clinic, where clinical examination and an electroencephalogram (EEG) showed no abnormality. The anticonvulsant was stopped gradually, and there have been no seizures in the four months since the single attack. Symptoms of anxiety continued for weeks, but she has not taken any tranquillisers.

Case 2—A 27-year-old woman had an eclamptic seizure after her first delivery seven years earlier. For four years she had been taking lorazepam 7.5 mg daily but it was stopped abruptly so that she might start a new tranquilliser. Twenty-four hours later, before she had taken the new drug, she had a tonic-clonic seizure and was admitted to hospital. Physical examination and an EEG were normal, and she was discharged without drugs. Once home she restarted lorazepam because of feelings of panic. Two months later she stopped the lorazepam, again abruptly, and 24 hours later had another tonic-clonic seizure. She was admitted under the medical firm who had managed her before, and an anticonvulsant was prescribed. It was weeks before she was able to leave her house because of anxiety and tremor. These symptoms settled spontaneously, the anticonvulsant has been withdrawn gradually, and there have been no seizures in the three months since her last attack.

Comment

Both these patients had been taking lorazepam for years but not in excessive doses. In each case abrupt withdrawal produced unpleasant symptoms and a seizure. The possibility that the seizures were due to drug withdrawal was not considered by the doctors who first saw the patients, and anticonvulsants were started.

In a study of abrupt withdrawal of chlorthalidone by placebo substitution all the patients experienced mild symptoms,³ but seizures seem more likely to occur after prolonged use or overdose. Although withdrawal seizures are not common, patients taking benzodiazepines should be warned to withdraw the drugs slowly. The possibility of drug withdrawal should be considered in any patient presenting with a seizure, for if this seems the likely cause prognosis and management will be radically altered.

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¹ Hollister LE, Motzenbecker FP, Degan RO. Withdrawal reactions from chlorthalidone. *Psychopharmacologia* 1961;2:63-8.

² Kendall MJ. Hazards of abrupt withdrawal of drugs. *Prescribers J* 1978;18:25-34.

³ Covi L, Lipman RS, Pattison JH, Derogatis LR, Uhlenhuth E. Length of treatment with anxiolytic sedatives and response to their sudden withdrawal. *Acta Psychiatr Scand* 1973;49:51-64.

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Meningitis caused by *Campylobacter fetus* ssp *jejuni*

Campylobacter fetus, formerly classified as *Vibrio fetus*, are bacteria well known to cause enteritis and, occasionally, systematic infections in man.¹ We report a case of meningitis caused by *Campylobacter fetus* ssp *jejuni*, a species not previously associated with this condition.

Case report

The patient was a 34-year-old American who had been operated on when aged 5 years for a neuroblastoma. He had suffered since from dysarthria and ataxia but his mental development was normal. In July 1979, when visiting Scandinavia, he developed fever and increasing ataxia and dysarthria. On admission to hospital after 24 hours he had signs of dehydration and meningitis. The cerebrospinal fluid (CSF) was clear and yellowish, and contained monocytes $184 \times 10^6/l$ ($184/mm^3$), polymorphonuclear leucocytes $155 \times 10^6/l$ ($155/mm^3$), protein 6.5 g/l, and glucose 0.5 mmol/l (9 mg/100 ml).

Concurrent blood glucose was 7.0 mmol/l (126 mg/100 ml). CSF microscopy was negative, but cultures yielded a spirochete-like organism that was later identified as *Campylobacter fetus* ssp *jejuni*. The organism was resistant to ampicillin but sensitive to chloramphenicol and metronidazole. On suspicion of a cerebellar tumour or abscess a computer-aided brain scan was performed. It showed a catheter running from the fourth ventricle through the ventricular system to the parenchyma of the right frontal lobe, a slight enlargement of the ventricular system, and a postoperative bone defect.

Treatment with chloramphenicol 1 g intravenously thrice daily for 11 days brought rapid recovery and a normal CSF. The patient was discharged and told to seek medical attention in the United States as soon as possible. For various reasons he did not do so until a week later and did not take any antibiotics during that period. He relapsed and was admitted to hospital with increased cerebellar symptoms and signs of meningitis. The CSF findings were almost identical to those described above, but cultures were sterile and microscopy did not show any micro-organisms. He did not respond to chloramphenicol 2 g intravenously twice daily, and his fever remained at about 39°C. The chloramphenicol was increased to 2 g four times a day. The symptoms then subsided and he recovered over the next seven days, after which he was afebrile and his CSF normal. Treatment was maintained for 14 days, and he was then followed up for six weeks without showing any further signs of relapse.

Comment

Campylobacter is well known to cause veterinary diseases and is one of the commonest causes of gastroenteritis in man.¹ A relatively large number of systemic infections caused by it, especially septicaemia, have been reported.¹ Most of these infections have been caused by *Campylobacter fetus* ssp *intestinalis*. The subspecies identified in our patient, *jejuni*, has only rarely been associated with systemic infections but seems to be the organism normally causing enteritis.¹ Our patient was compromised by his previous brain operation and by the resulting catheter in his ventricular system. Importantly, campylobacter systemic infections seem to be most prevalent in the type of patients who are at risk of developing infections caused by *Listeria monocytogenes*—that is, neonates and compromised adults. Since the clinical symptoms can be similar in these two infections, and since ampicillin is normally the drug of choice for treatment of listeriosis but is often inactive against *Campylobacter*,² this organism should be considered in the differential diagnosis in these patients.

We thank Dr M B Skirrow, Worcester Royal Infirmary, Worcester, England, for identifying the causative organism in this case.

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² Butzler JP, Dekeyser P, Detrain M, Dehean F. Related vibrio in stools. *J Pediatr* 1973;82:493-5.

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Differences in serum ampicillin concentrations among patients under constant-rate infusion

Continuous infusion of a drug at a constant rate is supposed to maintain its serum concentration at a constant and predictable level. We investigated the truth of this in patients treated with ampicillin for severe purulent meningitis.