An acute disseminated encephalomyelitis-like illness following alcohol withdrawal

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CASE REPORT

A 44-year-old man had a 1-year history of excessive alcohol consumption of three or more bottles of spirits per week. He decided to abruptly abstain from alcohol on holiday and, after approximately 24 hours, developed a generalized tonic clonic seizure. He was admitted to hospital in Greece where he was confused, disorientated, and had further seizures. Visual hallucinations and delusions developed. Investigations showed an elevated creatine kinase (CK) secondary to the seizure, raised gamma glutaryl transferase at 404 u/litre, a macrocytic anaemia with a mean corpuscular volume of 105.2 fl, and a thrombocytopenia with a platelet count of 86 x 10^9/litre. Serum sodium was normal at 139 mmol/litre. A computed tomography (CT) scan of the brain showed an enlargement of the subarachnoid spaces bilaterally in the frontal lobe, but no intracranial haemorrhage was seen. He was treated with benzodiazepines, thiamine, vitamin B compound preparation, and conservative intravenous fluids with 1 litre of dextrose per day. He was then transferred back to the UK after 2 weeks. As examination of the nervous system by a neurologist was normal, and there was no evidence of an active psychosis, he was discharged home.

He was admitted 5 days later with a 2-day history of weakness of the legs, unsteadiness and falls. He was able to give a clear history on admission, was alert and orientated, with no evidence of cognitive or psychiatric disturbance. Examination revealed a marked cerebellar dysarthria and no dysphasia. Optic discs were slightly pale but there was no papilloedema. Eye movements were grossly abnormal with square wave jerks, ocular bobbing in the primary position, jerky pursuit movement and gaze-evoked, almost pendular, nystagmus in the vertical and horizontal planes. Bilateral internuclear ophthalmoplegia was present, which was worse on the left. In the upper limbs he had downward drift of the right arm, grade 4 pyramidal weakness, poor fine finger movements and severe finger–nose ataxia, which was worse on the left. In the lower limbs he had a grade 2 flaccid paraparesis with areflexia, and no plantar response. General examination revealed a palpable bladder as a result of urinary retention. Urea, electrolytes and calcium were normal. Liver function tests were deranged. C-reactive protein was 40 mg/litre and erythrocyte sedimentation rate was 81 mm/hr. Full blood count revealed macrocytosis with a raised platelet count at 732 x 10^9/litre. Serum angiotensin-converting enzyme, CK, rheumatoid factor, anti-nuclear antibodies, anti-neutrophil cytoplasmic antibody, hepatitis B and C serology, toxoplasma serology, varicella zoster and herpes simplex immunoglobulin G were all normal or negative. CSF glucose was 3.7 mmol/litre (serum 7.4 mmol/litre), CSF protein was 1.36 g/litre, less than one polymorph, less than one red blood cell and five lymphocytes x 10^6/litre. No growth of any organisms occurred and polymerase chain reaction for herpes simplex, varicella zoster and enterovirus was negative. Oligoclonal bands were absent. Chest X-ray was normal. CT scan of the brain was normal. A magnetic resonance imaging scan of the brain revealed abnormal high T2 signal in the medulla, pons, left middle cerebral peduncle, mid brain and in the white matter of the right and to a lesser extent the left cerebral hemisphere (*Figure 1*). Moderate prominence of the ventricular and extra-ventricular CSF spaces was also seen. In the spinal cord there was a high T2 lesion in the cervical cord centred at C3/4 with further extensive skip lesions at the thoracic cord (*Figure 2*). Repeat imaging after 2 months showed less extensive brainstem white matter changes. Similarly, in the spinal cord the skip lesions showed modest resolution. The changes were thought to be more compatible with demyelination seen in acute disseminated encephalomyelitis rather than central pontine myelinolysis where symmetrical, central changes are seen.

Visual evoked potentials showed bilateral delay. Electroencephalogram showed background fast activity thought to be related to the benzodiazepines which later returned to normal.

He deteriorated with bulbar failure and aspiration pneumonia requiring intubation and ventilation. He received intravenous methyl prednisolone. He made a gradual recovery over 3 months with complete resolution of the brainstem syndrome. Bladder symptoms and a very mild paraparesis persisted.

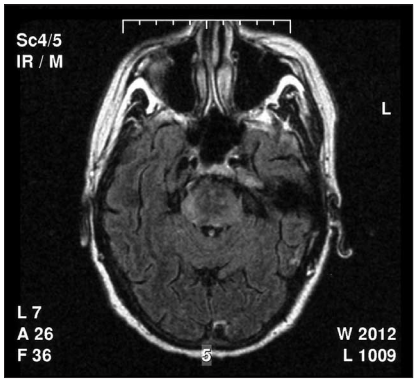
INTRODUCTION

Acute disseminated encephalomyelitis (ADEM) is a monophasic inflammatory demyelinating disorder which is often preceded by an infectious illness or vaccination. This article describes a man who presented with an ADEM-like illness following acute alcohol withdrawal in the absence of preceding infection or vaccination and without the metabolic disturbance or magnetic resonance imaging (MRI) changes seen in central pontine/extra pontine myelinolysis.

DISCUSSION

ADEM is a relatively rare monophasic demyelinating disorder of the CNS affecting both children and adults (Hartung and Grossman, 2001). It is the clinical counterpart to experimental allergic encephalomyelitis in animals and is thought to have an autoimmune basis in humans, typically occurring after infection or vaccination (Stüve

Figure 1. Axial magnetic resonance imaging fluid-attenuated inversion recovery sequence showing high T2 signal in the pons.



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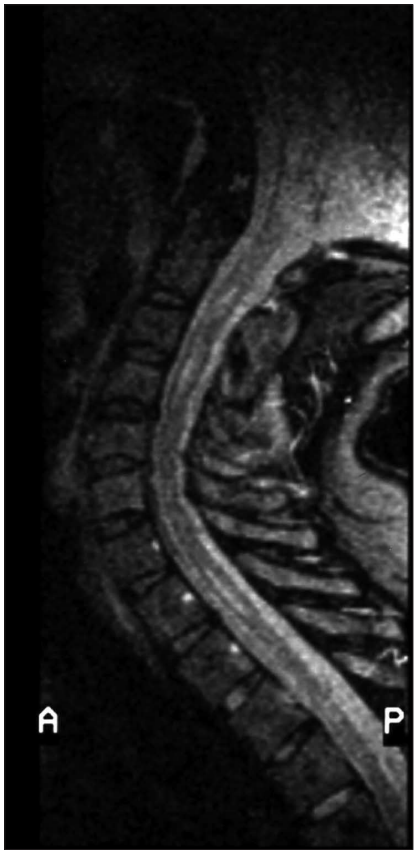
and Zamvil, 1999). It can present with a variety of multifocal neurological symptoms (Hartung and Grossman, 2001), and an adult series by Schwarz et al (2001) found that brainstem syndromes are common, occurring in 62%, with spinal cord syndromes being less common, occurring in 15%. Preceding infection only occurred in 46% of patients, 81% had CSF pleocytosis, and 42% did not have oligoclonal bands.

Figure 2. Sagittal magnetic resonance imaging T2 sequence showing high signal skip lesions in cervical and thoracic cord.



This patient had a monophasic multifocal neurological illness with brainstem and spinal cord features, CSF changes compatible with a non-infective inflammatory process, negative oligoclonal bands, and widespread inflammatory changes throughout the neuraxis compatible with ADEM. He showed a significant clinical response to steroids. There was no evidence of a preceding infection and no recent vaccinations. His illness was preceded by typical symptoms of acute alcohol withdrawal. However, his serum sodium was normal, he did not receive excessive amounts of intravenous fluids, and the MRI changes were asymmetric and did not exclusively involve the central pontine fibres, making the diagnosis of central pontine myelinolysis unlikely (Brown, 2000). Furthermore, the spinal cord lesions on MRI are not reported in extra pontine myelinolysis.

The authors' impression is that he had an ADEM-like illness during recovery from acute alcohol withdrawal, which has not previously been reported in the literature. The most likely scenario is that this association occurred by chance. The second possibility is that there is a link between the preceding episode of alcohol withdrawal and the development of an ADEM-like illness. However, it is hard to imagine that the alcohol withdrawal itself caused an immunological disturbance triggering ADEM. A third and unlikely explanation relates to the thrombocytopenia at initial presentation. It is conceivable that his neurological syndrome could have been caused by a mild episode of thrombotic thrombocytopenic purpura which was not considered at that time. However, in combination with abnormal liver function tests and macrocytosis, the low platelet count is most likely to be a result of the effects of chronic alcohol abuse. Furthermore, he did not have evidence of multiorgan failure and the MRI changes were not typical of thrombocytopenic purpura (Bakshi et al, 1999).

This case illustrates the grey area between ADEM and central pontine myelinolysis and suggests that, in some cases, inflammatory and metabolic factors may both be involved in the aetiology of ADEM. **HM**

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