Case Report

Reversible posterior leukoencephalopathy in a patient with systemic sclerosis/systemic lupus erythematosus overlap syndrome

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Introduction

Reversible posterior leukoencephalopathy is a recently recognized neurological syndrome, first characterized 7 years ago [1]. In this article, we present such a case with images typical of the syndrome. This is followed by discussion of the typical presentation, its associations, hypothetical aetiology and treatment modalities.

Case

A 39-year-old woman with systemic sclerosis/systemic lupus erythematosus overlap syndrome was admitted with fever. This followed a second course of pulsed intravenous cyclophosphamide for relapse of lupus nephritis WHO class IV with crescents. Her past history included Raynaud’s phenomenon, pulmonary fibrosis, oesophageal dysmotility and membranous glomerulonephritis causing nephrotic syndrome 8 years previously. She had also had seizures in pregnancy associated with pre-eclamptic toxaemia.

During the admission, her blood pressure rose to 170/100 mmHg. She developed cortical blindness followed by status epilepticus. A head computed tomography (CT) scan showed bilateral subcortical white matter changes in the posterior lobes, suggestive of posterior leukoencephalopathy. A magnetic resonance imaging (MRI) scan showed high T2 signal in the left cerebellar white matter and both occipital poles involving grey and white matter (Figure 1). A magnetic resonance venogram (MRV) was normal (Figure 2). Her blood pressure was controlled with intravenous nitrates and prostacyclin. Her symptoms resolved rapidly. A repeat MRI scan 2 weeks later showed resolution of some of the changes (Figure 3). A repeat renal biopsy showed crescent formation in two glomeruli with no evidence of malignant hypertension.

Three weeks later, her blood pressure rose once again to a maximum of 150/90 mmHg. She re-developed the cortical blindness, generalized hypertonicity and grand mal seizures. A third MRI scan showed that the findings of posterior leukoencephalopathy had mostly resolved, but there were now new bright subcortical white matter changes in the right pre- and postcentral gyri, both middle frontal gyri and the left superior frontal gyrus, suggesting the possibility of an acute vasculitis (Figure 4). Once again the MRV was normal.

Aggressive blood pressure control and immunosuppression with mycophenolate mofetil led to a resolution of all neurological symptoms and signs, and recovery of renal function over the ensuing 8 weeks. She remains well with immaculate blood pressure control and maintenance mycophenolate mofetil as immunosuppression.

Discussion

The syndrome of reversible posterior leukoencephalopathy was first described by Hinchey et al. in 1996 [1]. They noted a variety of disorders with neuroimaging changes suggestive of white matter oedema predominantly in the posterior regions of the brain. This was associated with a cluster of clinical findings including headache, altered consciousness, seizures and visual symptoms, including cortical blindness.

Conditions commonly associated with posterior leukoencephalopathy include hypertensive encephalopathy, pre-eclamptic toxaemia, renal failure and immunosuppressive or cytotoxic drugs [2,3], as in this case. Other reported associations include connective tissue diseases, thrombotic thrombocytopenic
purpura, porphyria and following organ transplantation.

Although the exact aetiology of the syndrome is not known, it is postulated that a rapid rise in blood pressure overcomes cerebral autoregulatory mechanisms causing dilatation of cerebral arterioles, opening of endothelial tight junctions and cerebral oedema. However, the syndrome can occur with fairly modest elevation of blood pressure and even in normotensive patients, as seen in some of the patients in the original series described by Hinchey. The effect of immunosuppressive drugs in the aetiology is even less certain: Garg [4] on reviewing the literature suggests that immunosuppressive or cytotoxic agents could cause the syndrome via a toxic effect on vascular endothelium or endothelin-mediated vasospasm, or by a direct effect causing axonal swelling.

We postulate that in this patient, the combination of a rapid rise in blood pressure associated with her connective tissue disease and renal failure were the principal reasons for the development of leukencephalopathy.

Although the leukencephalopathy is best demonstrated with MRI, CT scanning may be adequate.

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Fig. 1. MRI scan showing T2 high signal abnormalities in both occipital poles.

Fig. 2. Normal MRV.

Fig. 3. Repeat MRI scan showing resolution of some of the changes.

Fig. 4. MRI scan showing bright subcortical white matter changes suggesting acute vasculitis.
Typically, on imaging there is oedema predominantly affecting the white matter of the parieto-occipital regions of the brain. The distribution is usually, though not always, symmetrical. Involvement of grey matter and other regions of the brain including brainstem, cerebellum, basal ganglia and frontal lobes has been reported.

Although most of the cases described in the literature have resolved with treatment, in some there has been irreversible cerebral damage [5].

Treatment consists of meticulous blood pressure control and discontinuation or reduction of immunosuppressants/cytotoxics.

Conflict of interest statement. None declared.

References