Acute Disseminated Encephalomyelitis Associated With Hepatitis C Virus Infection

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Background: Acute disseminated encephalomyelitis (ADEM) is an autoimmune demyelinating disease of the central nervous system that is frequently preceded by an acute viral infection. This is the first reported case of ADEM associated with hepatitis C virus (HCV) infection.

Case Description: A 46-year-old woman underwent a surgical procedure and received multiple blood transfusions, at which time serologic testing for HCV was negative. Fifty days later, she suddenly developed seizures, alteration of consciousness, right hemiparesis, hemianopsia, and urinary retention. Magnetic resonance imaging revealed symmetric multifocal changes on T2-weighted images in the cerebral gray and white matter and in the cerebellar white matter with some lesion enhancement after gadolinium administration. Blood testing showed a recent HCV infection with high titer of IgM early antigens and a strongly positive reaction for HCV RNA. All other microbiological and virological test results were negative both in serum and in cerebrospinal fluid. Treatment with high-dose dexamethasone was followed by a dramatic improvement of the clinical and magnetic resonance picture. Within a few months the patient recovered completely and there were no relapses during 2 years of follow-up.

Conclusions: Infection with HCV is associated with several autoimmune neurological manifestations. It is recommended the patients with ADEM be screened for HCV.

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Routine blood screening was normal. Findings of electrocardiographic and chest x-ray film examinations were normal. Levels of anticardiolipin antibodies, antinuclear antibody, antineutrophil cytoplasmic antibody, cryoglobulins, neoplastic markers (α-fetoprotein, carcinoembryonic antigen, cancer antigen (CA) 125, CA 19.9, CA 15.5, and neuron-specific enolase) were also normal. The CSF examination showed mild pleocytosis and increased total protein (65 mg/dL [reference range, 15-45 mg/dL]). Isoelectrofocusing of paired CSF and serum samples showed a “mirror pattern” with numerous IgG oligoclonal bands in both CSF and serum.

Bacterial, mycobacterial, and fungal cultures from blood and CSF were negative. Results of serologic testing and CSF–polymerase chain reaction analysis for Borrelia burgdorferi, human immunodeficiency virus, adenovirus, Enterovirus, HSV types 1 and 2, cytomegalovirus, Epstein-Barr virus, human herpesvirus 6, polyomavirus JC, and hepatitis B virus were also negative.

Anti-HCV IgG, tested by second-generation enzyme-linked immunosorbent assay, was mildly positive; serum IgM antibodies to structural antigens (c33, c22, NS5) were strongly positive; and HCV RNA, detected by reverse transcription–polymerase chain reaction, was highly positive (2.800 MEq/mL), indicating recent HCV infection.8

An electroencephalogram showed severe diffuse theta-delta activity, predominantly on the right hemisphere. Magnetic resonance imaging (MRI) of the brain revealed symmetrical multifocal changes on T2-weighted images that involved gray and white matter in parieto-occipital regions involving gray and white matter more prominently on the left; symmetric multifocal changes in frontal and periventricular white matter. C and D, Complete recovery of abnormal signal foci.

T2-weighted magnetic resonance images obtained on admission (A, B) and at follow-up 5 months later (C, D). A and B, Large confluent areas of high-intensity signal in parieto-occipital regions involving gray and white matter more prominently on the left; symmetric multifocal changes in frontal and periventricular white matter. C and D, Complete recovery of abnormal signal foci.
occipital regions, hemispheric white matter in frontal and periventricular regions, and the cerebellar white matter. Some lesions presented enhancement after gadolinium administration. (Figure, A-B).

Treatment with intravenous dexamethasone, 0.6 mg/kg (30 mg) daily for 15 days was instituted. In the following days, the seizures ceased, her alertness increased, and both hemiparesis and hemianopsia improved. On the seventh day after admission, the foci of abnormal signal on brain MRI were remarkably reduced in number and size.

At discharge, 24 days after admission, neurological examination and brain MRI (Figure, C-D) had improved further. The intravenous dexamethasone regimen was tapered to a regimen of oral prednisone, 25 mg for 2 weeks, and then to 12.5 mg for 2 months.

Five months later, the patient showed complete resolution of clinical and neuroradiological signs. During the next 2 years, there were no relapses and the patient led a usual life.

In conclusion, we emphasize the importance of HCV screening in patients with ADEM because acute CNS demyelination might be the first manifestation of HCV infection.

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