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Letter to the Editor

Limbic encephalitis with autoantibodies against the glutamate receptor epsilon 2 mimicking temporal lobe epilepsy

The N-methyl-D-aspartate-type glutamate receptor epsilon 2 (GluR ε2) channels have been implicated in synaptic plasticity associated with neural development and learning. Recently, autoantibodies against GluR ε2 were found in some patients with Rasmussen's encephalitis[1] and non-herpetic limbic encephalitis.[2] This is a first case report of non-herpetic limbic encephalitis with autoantibodies against GluR ε2 showing neither MRI signal alterations nor abnormal cerebrospinal fluid (CSF) findings.

The patient was a 20-year-old woman with no prior history of neuropsychiatric disorders. She had insomnia, palpitations, anorexia, and general fatigue for 2 months prior to admission; these symptoms worsened gradually. Five days before admission, she developed rapidly recurring complex partial seizures (CPS) characterized by a motionless stare and unresponsiveness. EEG revealed ictal discharges beginning from the left temporal area.

Her body temperature was 37.9°C. Neurological examination was normal except for potentiation of her deep tendon reflexes in four limbs. Peripheral blood leukocyte count was 9400/μL. Biochemical blood studies were normal. Routine CSF studies showed no abnormalities; protein was 23 mg/dL and cell count was 2/μL. Polymerase chain reaction did not detect herpes simplex virus-1 or -2, human herpes virus-6 or -7, cytomegalovirus, or Epstein-Barr virus in CSF. MRI at 1.5 tesla did not reveal any signal alterations in her brain. CPS was controlled by the intravenous administration of diazepam. Surprisingly, Tc-99m SPECT on day 12 showed hyperperfusion in the left temporal lobe although the epileptic seizures had already disappeared. She recovered completely around day 50 following diverse neuropsychiatric symptoms such as transient aphasia, visual hallucinations, and emotional instability. SPECT showed disappearance of hyperperfusion in the left temporal lobe. Later, IgG autoantibodies against GluR ε2 were detected in CSF. During a follow-up period of 2 years, she has not developed any epileptic seizures. IgG autoantibodies against GluR ε2 disappeared in collection of CSF 2 years after her discharge.

We initially diagnosed her as having temporal lobe epilepsy since neither MRI nor CSF studies suggested encephalitis. However, SPECT showed hyperperfusion in her left temporal lobe although she was free from epileptic seizures. Moreover, she suffered from diverse neuropsychiatric symptoms following CPS for 50 days that could not be explained solely by postictal confusion. However, a limbic encephalitis could not be diagnosed definitely because no clear evidence of encephalitis was obtained until autoantibodies against GluR ε2 were detected.

Although the patient's encephalitis may have been caused by an undetected infectious agent, we propose a different explanation. A cell-mediated immune response may have caused tissue damage during an infectious episode before admission, resulting in the production of autoantibodies against GluR ε2. Alternatively, antibodies developing in response to an infectious agent may later have acted as autoantibodies against GluR ε2 because of molecular homology.

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