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Radiological Case of the Month

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A 4-YEAR-OLD boy was lethargic and grinding his teeth. He had an upper respiratory tract infection 2 weeks earlier. His medical history was unremarkable. On physical examination, his temperature was 36.6°C; heart rate, 120 beats per minute; respiratory rate, 18 beats per minute; and blood pressure, 94/59 mm Hg. Findings from neurological examination showed his pupils dilated but equally reactive (6-4 mm). He was irritable and lethargic with normal findings from sensory examination and deep tendon reflexes. Results of a lumber puncture included clear colorless fluid under normal pressure with no red blood cell count; total white blood cell count, 10.0×10^9/L (10% neutrophils, 90% lymphocytes) (manual differential on white blood cell count in cerebrospinal fluid); glucose concentration, 3.8 mmol/L (68 mg/dL); protein level, 290 mg/L, and negative findings from Gram stain. Magnetic resonance imaging showed multiple focal areas of signal hyperintensity within the periventricular white matter, corpus callosum, internal capsule, basal ganglia, midbrain, and pons (**Figures 1**, **2**, and **3**). He showed positive findings from a titer for Herpes simplex virus type I (IgM). Testing for visual-evoked response and brainstem auditory–evoked response showed abnormality bilaterally and delay on the left, respectively.

From the Northridge Hospital Medical Center Pediatric Intensive Care Unit, Northridge, Calif.

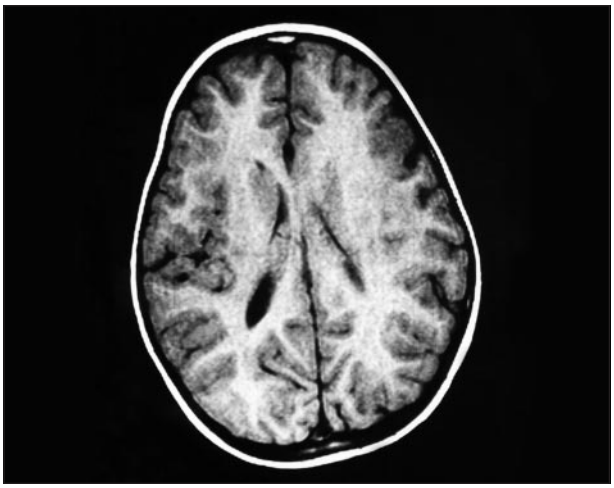

Figure 1.

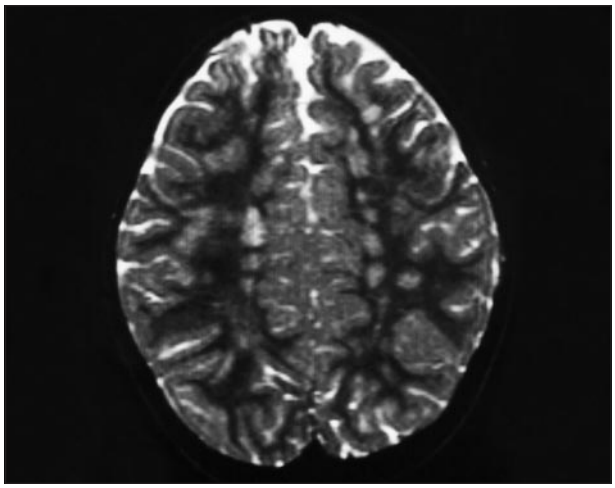

Figure 2.

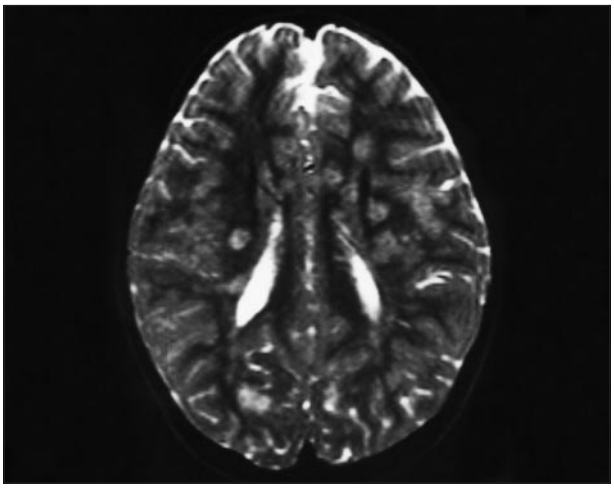

Figure 3.

Denouement and Discussion

Acute Disseminated Encephalomyelitis

Figures 1, 2, and 3. *Demonstration of high-density lesions in the periventricular white matter, corpus callosum, internal capsule, basal ganglia, midbrain, and pons.*

The diagnosis made was disseminated encephalomyelitis. His hospital stay was long and complex and included treatment with erythromycin ethylsuccinate for 10 days and acyclovir sodium for 21 days and high-dose steroids. Following treatment with acyclovir, the patient's balance, gait, and strength improved. Although his verbal level is still less than that of most 4 year olds, it has improved, and residual deficiencies are high-frequency hearing deficit in the left ear, impairment with problem solving, and short attention span.

Acute disseminated encephalomyelitis may develop late in the course of a viral illness, after a vaccination or bacterial infection such as mycoplasma. It is a monophasic, self-limiting disease similar to Guillian-Barré syndrome. Presenting symptoms include multifocal signs of central nervous system disease and are secondary to demyelinating lesions similar to those found in multiple sclerosis.[1] Studies by Rabinowitz et al[2] showed that there is sharing of antigenic determinants between the herpes virus and myelin basic protein, which results in cross-reaction in a host immune response. A temporary related central nervous system manifests as postinfections disseminated encephalomyelitis. Early detection and treatment is of paramount importance to restore neurologic function.[3] Herpes simplex virus may be diagnosed and detected in cerebrospinal fluid via polymerase chain reaction and magnetic resonance imaging. These tests are rapid, specific, and highly sensitive.[4] A combination of antiviral (acyclovir) and corticosteroid therapy given to 5 cases of "relapse" following herpes simplex encephalitis resulted in full recovery of 5 patients.[5] The experience of Rudd et al[6] indicates that long-term acyclovir therapy might prevent recurrent herpes simplex disease.

The diagnosis of acute disseminated encephalomyelitis may present a clinical dilemma to the medical practitioner. Early treatment is necessary if one is to prevent the devastating course of the illness. Our experience shows the importance of an early diagnosis of acute disseminated encephalomyelitis via polymerase chain reaction and magnetic resonance imaging. Early initiation of combination therapy of acyclovir and steroids has proven to be of immeasurable value regarding outcome.

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REFERENCES

1. Kesselring J, Miller DH, Robb SA, et al. Acute disseminated encephalomyelitis: MRI findings and distinction from multiple sclerosis. *Brain.* 1990;113:291-302.
2. Rabinowitz SG, Day ED, Paterson PY, Koenig H. Endogenous myelin basic protein serum factors (MBP) and anti-MBP antibodies in a patient with post-herpes simplex virus acute disseminated encephalomyelitis. *J Neurol Sci.* 1983;60:393-400.
3. Utley TF, Ogden JA, Gibb A, McGrath N, Anderson NE. The long term neurophysiological outcome of herpes simplex encephalitis in a series of unselected survivors. *Neuropsychiatry Neuropsychol Behav Neurol.* 1997;10:180-189.
4. Dominiques RB, Fink MC, Tsanaclis AM, et al. Diagnosis of herpes simplex encephalitis by magnetic resonance imaging and polymerase chain reaction assay of cerebrospinal fluid. *J Neurol Sci.* 1998;157:148-153.
5. Dennet G, Klapper PE, Cleator GM. Polymerase chain reaction in the investigation of "relapse" following herpes simplex encephalitis. *J Med Virol.* 1996;48:129-132.
6. Rudd G, Rivadeneira E, Gutman LT. Dosing consideration per oral acyclovir following neonatal herpes disease. *Acta Paediatr.* 1994;83:1237-1243.

Submissions

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