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Pathogen**

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Lymphocytic Choriomeningitis Virus: Reemerging Central Nervous System Pathogen

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ABSTRACT. Lymphocytic choriomeningitis virus (LCMV), a human zoonosis caused by a rodent-borne arenavirus, has been associated with both postnatal and intrauterine human disease. Infection in man is acquired after inhalation, ingestion, or direct contact with virus found in the urine, feces, and saliva of infected mice, hamsters, and guinea pigs. Congenital LCMV infection is a significant, often unrecognized cause of chorioretinitis, hydrocephalus, microcephaly or macrocephaly, and mental retardation. Acquired LCMV infection, asymptomatic in approximately one third of individuals, is productive of central nervous system manifestations in one half of the remaining cases. Aseptic meningitis or meningoencephalitis are the predominant syndromes, although transverse myelitis, a Guillain-Barré-type syndrome, as well as transient and permanent acquired hydrocephalus have also been reported. Fatalities are rare. We report a patient with meningoencephalitis attributable to LCMV and discuss the spectrum of central nervous system disease, newer diagnostic modalities, and preventive strategies. *Pediatrics* 2000;105(3). URL: <http://www.pediatrics.org/cgi/content/full/105/3/e35>; *lymphocytic choriomeningitis virus, aseptic meningitis, meningoencephalitis,*

transient and permanent acquired hydrocephalus and deafness.^{1,8} Neuropathologic studies of human and animal LCMV infection have demonstrated mononuclear cell infiltrates in meninges, choroid plexus, and ependyma.^{1,9,10} These observations may explain the obstructive hydrocephalus observed in both congenital and acquired LCMV infections with central nervous system involvement.

We suggest that LCMV infection of the central nervous system is underdiagnosed. Between 1941 and 1958 in a study of hospitalized patients with aseptic meningitis, nearly 10% were attributable to LCMV, and it was the most common cause during the winter months, presumably attributable to movement of mice indoors.¹¹ There are no pathognomonic signs, symptoms, or laboratory abnormalities in this infection. Fever, headache, nausea, vomiting, and occasional photophobia are prominent symptoms. As in our patient, significant CSF pleocytocytosis may occur, which is unusual in other viral infections. CSF white blood cell counts have ranged from <30 to >3000, generally predominantly mononuclear cells.¹² Normal to slightly decreased CSF glucose and slightly to moderately increased protein concentrations have been noted. CSF eosinophilia has been reported in 1 infected child.¹³

This case also illustrates the importance of using appropriate and sensitive diagnostic serologic tests. The complement fixation test for LCMV, although widely available, is insensitive^{14,15} and proved negative in our patient. Because of the strong suspicion of LCMV infection, repeat testing using the more sensitive IFA test was performed and revealed late acute or early convalescent LCMV infection with both measurable IgM and IgG antibody in the first serum specimen and only IgG antibody in the second (convalescent) specimen. A sensitive, enzyme-linked immunosorbent assay, which measures LCMV IgM and IgG is also available and performed at the Centers for Disease Control and Prevention.²

LCMV infections may be prevented by public education of the need to avoid contact with potentially infected rodents and their excreta. After diagnosis of LCMV meningoencephalitis in our patient, Health Department and school personnel were notified. Mousetraps were placed in and around the high

school and resulted in rapid abatement of the rodent infestation problem.

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