

# **West Virginia Department of Health and Human Resources Information for Physicians – La Crosse Encephalitis**

## **What are the symptoms of La Crosse infection?**

Clinical illness can range in severity from mild aseptic meningitis to severe disease mimicking herpes encephalitis. Lethargy, behavioral changes, disorientation, incoordination, focal motor abnormalities, and/or coma occur with severe disease. Seizures occur in 46% of children hospitalized with La Crosse encephalitis.

Laboratory findings may include peripheral leukocytosis (average 15,700 WBC/mm<sup>3</sup>) with a left shift, and CSF pleocytosis (average 130 / mm<sup>3</sup>). CSF glucose is usually normal, and protein is rarely elevated. Serological tests for arbovirus may be negative early in the course of illness.

## **How common is La Crosse encephalitis?**

West Virginia reports an average of 50 cases per year of La Crosse encephalitis. Most cases have been reported from the south central portion of our state; however, the disease is underreported and underdiagnosed. Most illness occurs in children less than 16 years of age; however, disease can occur at any age. The peak season for La Crosse is June through October.

## **How can I make the diagnosis?**

Diagnosis is confirmed only by the presence of clinical illness and:

- a four-fold rise in serum antibody, OR
- virus-specific immunoglobulin M (IgM) in CSF by antibody-capture enzyme immunoassay (EIA), OR
- virus-specific IgM in serum by antibody-capture EIA, and demonstration of virus-specific serum immunoglobulin G (IgG) antibodies in the same or a later specimen by another serologic assay (e.g. neutralization or hemagglutination inhibition), OR
- isolation of virus or detection of viral antigen in blood, CSF, or brain tissue.

Confirmed cases should be reported to the local health department so that an environmental investigation can be performed.

## **Where can I get laboratory testing for my patients?**

Testing of serum or CSF by the antibody capture enzyme-linked immunosorbent assay is available free of charge through the Office of Laboratory Services (OLS) at WVDHHR. Call 304-558-3530 to arrange.

OLS will routinely perform titers for La Crosse, eastern equine encephalitis, St. Louis encephalitis (SLE) and West Nile (WNV).

Practitioners should insist that their laboratory perform a quantitative serologic test (by IFA, hemagglutination-inhibition, neutralization assay, or EIA), and that serum is also screened for eastern equine encephalitis, St. Louis encephalitis, and West Nile virus.

### **What is the prognosis for patients infected with La Crosse encephalitis?**

Mortality is less than 1%. In most cases, neurologic and behavioral sequelae resolve within a few months; however, there are significant long-term neurologic, cognitive, and behavioral deficits in some children.

### **What other diagnoses should be considered?**

While a full listing is not possible here, the major differential considerations include:

- Herpes Simplex encephalitis (HSE),
- enterovirus infection, and
- partially treated meningitis.

HSE should be considered in children presenting with focal neurologic or EEG findings because early therapy with acyclovir improves prognosis.

### **What therapy is recommended for La Crosse encephalitis?**

In mild cases, treatment is supportive. Children with focal findings should be considered for treatment with acyclovir for presumed Herpes Simplex encephalitis (HSE) until the diagnosis is ruled out. Practitioners caring for a child who has seizures, hyponatremia, or disorientation should strongly consider transfer to a Pediatric Intensive Care Unit (PICU) for close monitoring. Whether on the pediatric floor or in PICU, the child's mental status should be monitored using Glasgow Coma Scale. Children with seizures, hyponatremia, or deterioration in mental status should be managed in consultation with an expert. Even children with very severe disease can improve markedly with aggressive management.

Ribavirin is being used experimentally in the treatment of La Crosse encephalitis, but no data is yet available on efficacy.

Confirmed cases should be reported to the local health department. Your local health department will do an environmental investigation and educate the parents about preventing the disease.

For more information:

1. Mc Junkin, J. E., et.al., 'California La Crosse encephalitis' *Infect Dis Clin North Am*, 1998; 12:83-93.
2. Rust, R. S., et.al, 'La Crosse and other forms of California encephalitis' *J Child Neurol*, 1999; 14:1-14.
3. Balkhy, H H., and Schreiber, J. R., 'Severe La Crosse encephalitis with significant neurologic sequelae' *Pediatr Infect Dis J*, 2000; 19:77-80.
4. McJunkin, J. E., et.al. 'Treatment of severe La Crosse encephalitis with intravenous ribavirin following diagnosis by brain biopsy.' *Pediatrics*, 1997; 99:261-7.
5. McJunkin, et.al., 'La Crosse encephalitis in children,' *N Engl J Med*, 2001; 344:801-7.