MAYO CLINIC LABORATORIES

Test Definition: CAVP

California Virus (La Crosse) IgG and IgM, Serum

Overview

Useful For
Aiding the diagnosis of California virus (La Crosse) using serum specimens

Testing Algorithm
For more information see Mosquito-borne Disease Laboratory Testing.

Special Instructions
- Mosquito-borne Disease Laboratory Testing

Method Name
Immunofluorescence Assay (IFA)

NY State Available
Yes

Specimen

Specimen Type
Serum

Ordering Guidance
This assay detects only California virus. For a complete arbovirus panel, order ARBOP / Arbovirus Antibody Panel, IgG and IgM, Serum.

Specimen Required
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL
Collection Instructions: Centrifuge and aliquot serum into plastic vial.

Forms
If not ordering electronically, complete, print, and send Infectious Disease Serology Test Request (T916) with the specimen.

Specimen Minimum Volume
0.15 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	14 days	
	Frozen	14 days	

Clinical & Interpretive

Clinical Information

California virus (La Crosse) is a member of the Bunyaviridae family and is one of the arthropod-borne encephalitides. It is transmitted by various *Aedes* and *Culex* mosquitoes and is found in such intermediate hosts as the rabbit, chipmunk, and field mouse.

California meningoencephalitis is usually mild and occurs in late summer. Ninety percent of infections are seen in children under 15 years of age, usually from rural areas. The incubation period is estimated to be 7 days, and acute illness lasts 10 days or less in most instances. Typically, the first symptoms are nonspecific, lasting 1 to 3 days, and are followed by the appearance of central nervous system signs and symptoms, such as stiff neck, lethargy, and seizures, which usually abate within 1 week. Symptomatic infection is almost never recognized in those over 18 years old. The most important sequela of California virus encephalitis is epilepsy, which occurs in about 10% of children; almost always in patients who have had seizures during the acute illness. A few patients (estimated 2%) have persistent paresis. Learning disabilities or other objective cognitive deficits have been reported in a small proportion (no more than 2%) of patients. Learning performance and behavior of most recovered patients are not distinguishable from comparison groups in these same areas.

Infections with arboviruses can occur at any age. The age distribution depends on the degree of exposure to the particular transmitting arthropod relating to age, sex, and occupational, vocational, and recreational habits of the individuals. Once humans have been infected, the severity of the host response may be influenced by age. Serious California (La Crosse) virus infections primarily involve children, especially boys. Adult males exposed to California viruses have high prevalence rates of antibody but usually show no serious illness. Infection among males is primarily due to working conditions and sports activities taking place where the vector is present.

Reference Values

IgG: <1:10
IgM: <1:10
Reference values apply to all ages.

Interpretation

In patients infected with these or related viruses, IgG antibody is generally detectable within 1 to 3 weeks of onset, peaking within 1 to 2 months and declining slowly thereafter.

IgM class antibody is also reliably detected within 1 to 3 weeks of onset, peaking and rapidly declining within 3 months.

Single serum specimen IgG of 1:10 or greater indicates exposure to the virus.

Results from a single serum specimen can differentiate early (acute) infection from past infection with immunity if IgM is positive (suggests acute infection).

A 4-fold or greater rise in IgG antibody titer in acute and convalescent sera indicates recent infection.

Cautions

All results must be correlated with clinical history and other data available to the attending physician.

Specimens collected within the first 2 weeks after onset are variably negative for IgG antibody and should not be used to exclude the diagnosis of arboviral disease. If arboviral infection is suspected, a second specimen should be collected and tested 10 to 21 days later.

Usually, when an infection with an arbovirus is suspected, it is too late to isolate the virus or collect serum specimens to detect a rise of antibody titer.

Clinical Reference

1. Gonzalez-Scarano F, Nathanson N: Bunyaviruses. In: Fields BN, Knipe DM, eds. Fields Virology. Vol 1. 2nd ed. Raven Press; 1990:1195-1228
2. Donat JF, Rhodes KH, Groover RV, Smith TF: Etiology and outcome in 42 children with acute nonbacterial meningoencephalitis. Mayo Clin Proc. 1980 Mar;55(3):156-160
3. Tsai TF: Arboviruses. In: Murray PR, Baron EJ, Pfaller MA, et al, eds. Manual of Clinical Microbiology. 7th ed. American Society for Microbiology; 1999:1107-1124
4. Calisher CH: Medically important arboviruses of the United States and Canada. Clin Microbiol Rev. 1994 Jan;7(1):89-116
5. Dolin R: California encephalitis, hantavirus pulmonary syndrome, hantavirus hemorrhagic fever with renal syndrome, and bunyavirus hemorrhagic fevers. In: Bennett JE, Dolin R, Blaser MJ, eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Elsevier; 2020:2169-2176

Performance

Method Description

The indirect immunofluorescent antibody (IFA) assay is a 2-stage “sandwich” procedure. In the first stage, the patient serum is diluted in Pretreatment Diluent for IgM and phosphate buffered saline (PBS) for IgG, added to appropriate slide wells in contact with the substrate, and incubated. Following incubation, the slide is washed in PBS which removes unbound serum antibodies. In the second stage, each antigen well is overlaid with fluorescein-labeled antibody to IgM and IgG. The slide is incubated allowing antigen-antibody complexes to react with the fluorescein-labeled anti-IgM and anti-IgG. After the slide is washed, dried, and mounted, it is examined using fluorescence microscopy. Positive reactions appear as cells exhibiting bright apple-green cytoplasmic fluorescence against a background of red negative control cells. Semi-quantitative endpoint titers are obtained by testing serial dilutions of positive specimens.(Package inserts:

Arbovirus IFA IgM and Arbovirus IFA IgG Instructions for Use. Focus Diagnostics; Rev. 02, 05/01/2018)

PDF Report
No

Day(s) Performed
May through October: Monday through Friday
November through April: Monday, Wednesday, Friday

Report Available
Same day/1 to 4 days

Specimen Retention Time
2 weeks

Performing Laboratory Location
Rochester

Fees & Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification
This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information
86651 x 2

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CAVP	Calif Virus (LaCrosse)IgG and IgM,S	96499-9

Result ID	Test Result Name	Result LOINC® Value
8764	Calif (LaCrosse) Encep Ab, IgG, S	In Process
87280	Calif (LaCrosse) Encep Ab, IgM, S	In Process