

Animal Surveillance Case Definition

Lymphocytic choriomeningitis virus (LCMV)

Clinical description

A communicable disease of rodents, sporadically transmitted to people, that is caused by an *Arenavirus*. The reservoir is the house mouse (*Mus musculus*). Naturally infected rodents do not usually develop clinical signs. Mice shed the virus through body secretions, and transmission of the virus is both vertical (transovarial) and horizontal. Vertical infection becomes chronic in rodent populations, and as a result, their environment is constantly contaminated through their excreta. Transmission of the virus via arthropod vectors has been demonstrated in the laboratory, but it is unknown how significant this mode of transmission is in nature. Mice can transmit the virus to other animal species, notably pet hamsters and guinea pigs, which in turn can infect man. Human infection appears to occur through a variety of routes including rodent bites, handling dead mice and via food contaminated with mouse feces or urine. Person to person transmission is infrequent, occurring congenitally, during an autopsy procedure and via organ transplantation.

The disease in man ranges from clinically inapparent to, in a few very rare cases, fatal. The incubation period ranges from 7 to 14 days. Although the clinical picture is usually mild and self-limiting, severe illness can occur, including meningoencephalitis resulting in neurologic damage and death, particularly in immunocompromised persons and fetuses born to infected pregnant women. Along with the growth in popularity of hamsters as pets, LCMV cases associated with these animals have increased. Cases of LCMV have also been associated with rodent-infested homes and laboratory contact with contaminated cell cultures.

In 2005, three of four organ transplant recipients in Rhode Island and Massachusetts died of LCMV. Epidemiologic investigation traced the source of the virus to a pet hamster owned by the organ donor that originated from a large distributor. Testing identified an infection rate of approximately 3% among hamsters sampled at this distributor. Biosecurity at the facility was poor, allowing wild rodents to intermingle with hamsters and guinea pigs raised for the retail pet trade.

Case classification

LCMV testing is not available commercially and must be done at the CDC laboratory, only after approval by NJDHSS. Testing is usually only conducted in rodents epidemiologically linked to a human LCMV case. Laboratory diagnostic methods for humans include isolation of virus from blood or CSF, elevation of IgM using ELISA or IFA, and immunohistochemistry staining of tissues. Serologic testing of pet rodent species for antibodies against LCMV has not been reliable; the tests have not detected antibodies in animals with active infections demonstrated by other tests (i.e., immunohistochemistry staining of tissues and virus isolation). The unreliability of serologic testing is of concern because certain species of pet rodents infected with LCMV can shed virus for up to 8 months without signs of illness, thus presenting an unidentifiable source of infection for humans.