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Interim Guidance for Minimizing Risk for Human Lymphocytic Choriomeningitis Virus Infection Associated with Rodents

In May 2005, CDC received reports of four organ-transplant recipients with unknown illness. All were discovered to have been infected with lymphocytic choriomeningitis virus (LCMV) via a common organ donor (1). Epidemiologic investigation traced the source of the virus to a pet hamster purchased by the donor from a local pet store. LCMV testing of other rodents at the pet store revealed three other LCMV-infected rodents (two hamsters and a guinea pig), supplied by a single distributor (distributor A). Preliminary laboratory testing of hamsters from distributor A has identified an infection rate of approximately 3% among the animals sampled. The facility of distributor A is under quarantine until it can be documented as free of LCMV infection. This report provides background information on LCMV and interim guidance* for the public on reducing risk for LCMV infection from pet rodents.

Background Information

LCMV is a rodent-borne arenavirus endemic in house mouse (*Mus musculus*) populations worldwide (3–5). Pet rodents (e.g., hamsters and guinea pigs) can become infected with LCMV after contact with wild rodents at a breeding facility, pet store, or home. The prevalence of LCMV in pet rodents is not known. Although other animals could possibly become infected with the virus, documented infections in humans have occurred only after exposure to infected mice, guinea pigs, and hamsters (6,7).

LCMV infection in humans with normal immune systems usually causes either asymptomatic or mild, self-limited illness, characterized by any or all of the following symptoms: fever, malaise, lack of appetite, muscle aches, headache, nau-

sea, and vomiting. Aseptic meningitis also can occur in some patients, but the infection is rarely fatal (6). LCMV infection during the first or second trimester of pregnancy can cause severe illness or developmental defects in the fetus, including hydrocephalus, psychomotor retardation, and blindness (8); the proportion of developmental defects caused by LCMV is not known. Serologic studies of previous infection in humans in urban areas of the United States have demonstrated a prevalence of previous LCMV in those populations of approximately 5% (3).

Person-to-person transmission has not been associated with LCMV, except for transmission from mother to fetus or through organ transplantation (1). Human infection occurs most commonly through exposure (by direct contact or aerosol) to secretions or excretions of infected animals (9). LCMV infection is a well-known occupational risk for laboratory workers who work with LCMV-infected laboratory rodents (9).

An outbreak associated with pet hamsters sold by a single distributor was reported in 1974, when 181 symptomatic cases in persons with hamster contact were identified in 12 states; no deaths occurred (10). The outbreak was brought under control by voluntary cessation of sale and destruction of the infected breeding stock.

Control of Wild Rodents

Environmental modifications and hygiene practices that deter rodents from colonizing the home and work environment are the best means of reducing risk for exposure to infectious rodents. In addition, if rodents are found in work or living areas, safe practices for cleaning rodent waste and nesting materials are recommended. Preventing wild rodent entry also reduces opportunity for infection of pet rodents.

Detailed instructions on rodent-proofing, safe cleaning practices, and trapping wild rodents are available at <http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/lcmv.htm>.

*These recommendations were assembled by a CDC working group to provide interim guidelines for protection of public health. Guidelines for care of laboratory animals have been published previously (2). In addition, the National Association of State Public Health Veterinarians, in conjunction with partners, is developing a set of comprehensive veterinary infection-control guidelines.

General Recommendations for Preventing LCMV Infection from Pet Rodents

Hamsters and other rodents are common pets, and the number of documented human LCMV infections from pet hamsters and other rodents is low. Basic precautions can reduce the risk for acquiring LCMV and other infections from pet rodents. Because rodents might not always exhibit signs of ill health resulting from LCMV infection, CDC recommends taking appropriate precautions with any rodent:

- The public should be apprised of the risk for LCMV infection from rodents purchased from *any* pet store.
- Destruction or return of recently purchased pet rodents is not recommended. The probability of any one animal harboring LCMV infection is low. All pets are potential carriers of infectious diseases and should always be handled by using appropriate precautions.
- Pet rodents must not be released into the wild to prevent introduction of nonnative species to North America.
- Persons with specific concerns regarding the health of their pets should seek guidance from a veterinarian.

Purchasing a Healthy Pet

Information on purchasing a healthy pet and general steps to prevent pet rodents from bringing diseases into the home is available at http://www.cdc.gov/healthypets/lcmv_rodents.htm.

Care of Pet Rodents

Anyone handling or keeping pet rodents should take the following precautions to reduce the risk for LCMV infection:

- Wash hands with soap and water (or alcohol-based hand sanitizers when soap is unavailable and hands are not visibly soiled) after handling pet rodents or cleaning up pet droppings, cages, or areas where pets have been.
- Keep rodent cages clean and free of soiled bedding.
- Clean cages outdoors or in a well-ventilated area.
- Closely supervise young children when cleaning cages or handling rodents and supervise or assist children in washing their hands immediately after handling rodents and rodent cages or bedding.
- Never kiss or hold pet rodents close to the face.
- Never allow pet rodents to come into contact with wild rodents or their droppings or nests. Cover pet rodent cages and food supplies and always supervise pet rodents when they are not in their cages.

Precautions for Pregnant Women

Although the risk for LCMV infection from pet rodents is low, pregnant women or women who think they might become pregnant should be aware of the risks associated with LCMV infection during pregnancy. The following precautions can be taken to reduce the risk for acquiring LCMV infection during pregnancy:

- Avoid contact with wild rodents. Pregnant women who reside in a household with a wild rodent infestation should have the infestation addressed promptly by a professional pest control company or another member of the household.
- Keep pet rodents in a separate part of the home. Pregnant women should ask another family member or friend to clean the cage and care for the pet or arrange for temporary adoption of the pet by a responsible person. Pregnant women should avoid prolonged stays in any room where a rodent resides.

Precautions for Persons with Weakened Immune Systems

For the organ recipients described in this report, transplantation of LCMV-infected organs into persons with medically induced immunosuppression likely increased disease severity. Persons with impaired immune-system function should avoid contact with all rodents.

Testing for LCMV in Pet Rodents

CDC does not recommend testing pet rodents. Serologic testing on rodents can be inaccurate and misleading. All pet animals should be assumed capable of transmitting certain infectious diseases.

Testing for LCMV in Humans

Testing for LCMV infection in asymptomatic persons is not necessary. Similarly, testing persons with previous history of LCMV-compatible illness generally is not useful. Persons with active disease suggestive of LCMV should seek medical care and report any exposures to wild or pet rodents. A physician should determine whether testing for LCMV is indicated. Physicians should work closely with their respective state health departments to discuss forwarding of samples to state laboratories or CDC for testing.

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