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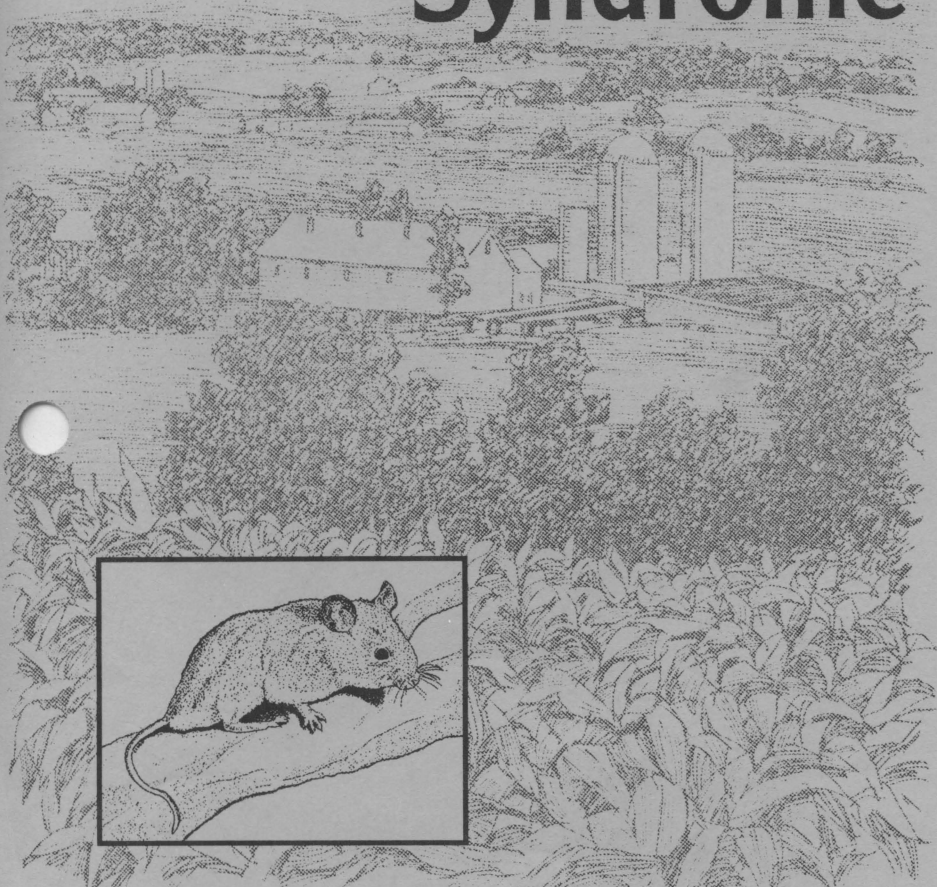
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Hantavirus Pulmonary Syndrome



A14827511702

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HANTAVIRUS PULMONARY SYNDROME

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Hantavirus pulmonary syndrome is a highly fatal human illness that occurs within 45 days (usually 2 to 4 weeks) after exposure to the virus. It is characterized by fever, chills, cough, headache, and muscle aches that last 1 to 4 days, followed by sudden and progressive difficulty in breathing due to fluid build-up in the lungs. Death occurs because of respiratory insufficiency and shock. Recovery from hantavirus disease is protracted and difficult. The Centers for Disease Control and Prevention (CDC) has given the designation "hantavirus pulmonary syndrome" (HPS) to human hantavirus disease in the United States.

BACKGROUND

HPS is caused by a virus that persistently infects rodents. It is now called the Sin Nombre virus (SNV), but other common names are Muerto Canyon virus and Four Corners virus. Other hantaviruses closely related to SNV also cause HPS and reside in rodent reservoirs in the U.S.

Hantaviruses are by no means new, but, before 1993, no confirmed cases of HPS had been reported in the U.S. By March 22, 1995, however, 106 confirmed cases of HPS from 21 states resulted in 55 deaths. Of these cases, 56 percent were male; the age range was 11 to 69; and the median age was 37.

Before the recent emergence of HPS as a new and highly fatal human disease, hemorrhagic fever with renal syndrome (HFRS) in Asia and Europe (which is different from HPS) was the only known rodent-transmitted hantavirus condition affecting human beings. At least three different types of hantavirus cause HFRS.

Other hantaviruses have been identified, but their association with human disease is not clear. Public health officials in the U.S. are very concerned about HPS because the human case fatality rate of 52 percent is many times greater than that of all other known hantaviruses.

VECTORS OF THE DISEASE

Most cases of HPS have been recognized in Southwestern regions of the U.S., but cases have been reported in the Midwest, the mid-Atlantic region, Florida, Louisiana, and Rhode Island.

Rodents that are reservoirs for hantavirus are distributed widely across the U.S.

The deer mouse (*Peromyscus maniculatus*) is the most important reservoir for hantavirus in the U.S., excluding the Southeast. Western harvest mice (*Reithrodontomys megalotis*) have recently been found to be reservoirs in the Four Corners area (Utah, Colorado, Arizona, and New Mexico). The white-footed mouse (*P. leucopus*) may serve as a reservoir in mid-Atlantic states such as North Carolina and Virginia. Ten other rodent species and one rabbit species have been shown to harbor SNV infection.

MODES OF INFECTION

Contact with hantavirus-infected rodents is the primary source of human exposure. Rodents infected with hantavirus are not obviously sick but shed the virus in feces, urine, and salivary excrement for several weeks to a year.

Human beings are exposed through inhaling hantavirus that is aerosolized (made airborne) when contaminated rodent excretions are disturbed. Human infection can also occur after hantavirus-contaminated excretions contact a cut or the linings of the eyelids or after a rodent bite. Exposure may also possibly occur through ingestion of contaminated food or water.

Transmission of hantavirus from rodents to people via arthropod vectors (such as fleas) is thought to be of minimal importance. Hantavirus transmission from an infected person to another person has not been documented to date. There is no evidence that dogs and cats are affected by the virus, but pet owners should be aware that their dogs or cats could accidentally expose them to hantaviruses through infected rodents that they capture.

RISK FACTORS

Activities associated with a high risk of exposure to hantavirus are:

- Outdoor agricultural work (especially planting or harvesting field crops).
- Inhabiting previously vacant buildings.
- Cleaning outdoor structures such as barns.
- Disturbing rodent-infested locations while camping or hiking.

- Residing in normally occupied buildings with known indoor rodent populations.
- Short- or long-term exposure to rodent-dense areas.

PREVENTION

Human exposure to hantavirus is prevented by avoiding contact with rodents and rodent-infested areas, by controlling rodent populations, and by proper sanitation. To reduce exposure to hantavirus:

- Avoid rodent burrows. Do not disrupt soil around these areas.
- Exclude rodents from your home. Seal all openings inch or larger.
- Air out closed buildings that may have rodents for at least 30 minutes before entering.
- Avoid sweeping or vacuuming rodent fecal material. Use the disinfection method described below when cleaning up this material.
- Clean counter tops, floors, cupboards, etc., contaminated by rodents with a **fresh** bleach or Lysol solution (described below).
- Steam-clean contaminated carpets with a Lysol solution (described below) rather than sweeping or vacuuming.
- Trap deer mice with a snap trap baited with chunky-style peanut butter. Dispose of dead rodents using the method described on page 4.
- Keep food in mouse-proof containers and maintain good sanitary practices.
- Institute a rodent control program around barns, grain bins, and shops.

Disinfection Method for Cleaning Up Fecal Material. Thoroughly wet the fecal material with a fresh bleach ($1/2$ cup to 5 cups water) or Lysol® (according to label instructions) solution. Allow 10 to 15 minutes for the disinfectant to work. Spray the surrounding area with additional disinfectant before starting clean-up to keep dust to a minimum. **Always wear rubber gloves and a NIOSH-approved High Efficiency Particulate Air (HEPA) respirator.**

Wipe up the damp fecal material and dispose of it in a plastic bag. Burn or bury the bag.

Note that bleach contains sodium hypochlorite, which is a skin and eye irritant. Inhaling the fumes can be irritating to mucous membranes. Do not get the solution on your clothing. Read and follow all label precautions and get prompt medical attention if a problem arises.

Disposing of Dead Rodents. Wear rubber gloves and a HEPA-model mask when handling dead mice. Spray the mouse and the surrounding area with a contact insecticide that says on the label that it kills fleas. Follow all label directions. There is no evidence that fleas transmit hantavirus, but in some areas of the Southwest, murine typhus and plague (flea-borne) are a concern.

Wet down the rodent with a disinfectant solution (like that described previously) before removing it from the trap. Dispose of the rodent by the inverted plastic bag method. Put your hand (with the glove on) on the bottom of a plastic bag and push up through the bag opening, so that the bag is inverted over your hand. Grasp the dead mouse through the bag and, using the other hand (also with the glove on), turn the bag right-side-out so that the rodent is inside. Seal the bag securely. Then burn or bury the bag. Disinfect the trap by submerging it in a fresh bleach or Lysol solution.

Wash the gloves with a disinfectant solution while you are still wearing them. Discard the gloves and wash your hands and arms with a disinfectant soap.

For More Information. The CDC has published detailed guidelines on how low- and high-risk groups may prevent or minimize exposure to hantavirus. Copies of this document, "Hantavirus Infection—Southwestern United States: Interim Recommendations for Risk Reduction," may be purchased from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402-9325
Telephone: (202) 512-1800.

Since guidelines may change as new information on HPS becomes available, the CDC advises that high-risk workers responsible for environmental sanitation in hantavirus-affected areas contact the appropriate local and state health departments for specific guidelines on these procedures. For further informa-

tion concerning rodent control in hantavirus-infected areas, contact:

General Sanitation Division
Texas Department of Health
1100 West 49th Street
Austin, Texas 78756
Telephone: (512) 834-6635.

TREATMENT

Prompt recognition and examination for possible HPS at a medical facility is important to successful treatment. A physician should call the local health department or the Texas Department of Health (1-800-252-8239) for advice about testing and treatment. The physician or other health professional should also notify the proper state health agency to prevent further human exposure to hantaviruses. No effective vaccine is currently available to prevent HPS.

REVIEW

In summary, hantavirus pulmonary syndrome cases have been confirmed in Texas. The virus is carried by rodents, primarily the deer mouse. The disease is highly fatal. Every person should understand how to reduce the risk factors for exposure to hantavirus. If you develop HPS symptoms, especially if you are a rural resident and have had significant exposure to similar risk factors, contact a doctor immediately. Tell the doctor that you may have encountered risk factors suggestive of exposure to SNV.

REFERENCES

The information in this publication was adapted from these sources:

Weigler, B. J. "Zoonotic Hantaviruses: New Concerns for the United States." *Journal American Veterinary Medical Association* 1995; 206:979-986.

Personal Communication. Centers for Disease Control and Prevention, Division of Viral and Rickettsial Diseases, Atlanta, Georgia 30333. April 1995.

Personal Communication. Texas Department of Health, Zoonosis Division, Austin, Texas 78756. April 1995.

Personal Communication. Bill Kvasnicka, Extension Veterinarian, University of Nevada, Reno, Nevada 89557. April 1995.

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Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Zerte L. Carpenter, Director, Texas Agricultural Extension Service, The Texas A&M University System.