HANTAVIRUS

Animal Group(s) Affected	Transmission	Clinical Signs	Severity	Treatment	Prevention and Control	Zoonotic
Humans, rodents	Infection in rodents occurs horizontally, often associated with fighting. Humans are infected via inhalation of the virus in aerosolized urine, feces, or saliva; by direct contact with these materials; or by the bite of an infected rodent.	Early signs include fatigue, fever, myalgia, nausea, vomiting, and abdominal pain. Later signs include coughing, shortness of breath and tachycardia. Illness can progress rapidly to severe cardiorespiratory failure and shock.	It can be fatal - US mortality rate is 38%.	No cure exists.	Avoid contact with wild and peridomestic rats and mice; rodent control; use appropriate personal protective equipment – especially respiratory - when infestations are severe.	Yes

Fact Sheet compiled by: Gerardo Suzán and A. Alonso Aguirre

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Fact Sheet Reviewed by: James N. Mills; Ricardo Morales

Susceptible animal groups: Humans. Other mammal species may be infected through contact with rodents, but they are not known to have clinical signs or to transmit the virus to other animals or humans.

Causative organism: Hantaviruses in the Americas cause a pulmonary syndrome while Old World hantaviruses in Eastern Asia cause hemorrhagic fever with renal syndrome.

Zoonotic potential: Yes, directly from rodents or their contaminated products.

Distribution: Hantavirus pulmonary syndrome is distributed in the Americas in rural areas in peridomestic settings (barns, outbuildings, and sheds). Old World hantaviruses that produce hemorrhagic fever with renal syndrome are reported in both rural and urban areas.

Incubation period: 1 to 5 weeks.

Clinical signs: Early signs include fatigue, fever, myalgia (thighs, hips, back, and shoulders), nausea, vomiting, and abdominal pain. Later, up to 10 days post-infection, signs include coughing and shortness of breath, and tachycardia. Illness can progress rapidly to severe cardio-respiratory failure and shock.

Post mortem, gross, or histologic findings: Hantavirus pulmonary syndrome is characterized by a unique constellation of pulmonary, hematological, and reticuloendothelial pathological findings.
Findings may include pleural effusions, alveolar edema and fibrin, and an interstitial mononuclear cell infiltrate. Immunoblast type cells in the lungs, blood, bone marrow, lymph nodes, liver, and spleen.

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Hematological findings include left-shifted neutrophilic leukocytosis, thrombocytopenia, hemoconcentration in severe cases, and circulating immunoblasts.

Diagnosis: Detection of hantavirus-specific IgM antibodies or a 4-fold or greater increase in hantavirus-specific IgG antibody titer and detection of hantavirus antigen by immunohistochemistry in serum. Other tissues including lung, spleen, kidney, liver and heart can be used for Immunohistochemistry (IHC) and reverse transcriptase-PCR (RT-PCR) as post-mortem options.

Material required for laboratory analysis: Nobuto blood filter strips (Advantec Nobuto Blood Filter Strip, Cole-Palmer) is used with whole blood.

Relevant diagnostic laboratories:
Centers for Disease Control and Prevention, Viral Special Pathogens Branch
1600 Clifton Rd
Atlanta, GA 30333
Hotline (877) 232-3322
(404) 639-1510

Treatment: While no primary cure for hantavirus pulmonary syndrome, supportive treatment should include respiratory intensive care management and oxygen therapy. Ribavirin in treating hantavirus pulmonary syndrome has little effect.

Prevention and control: Avoid contact with wild and peridomestc rats and mice. Rodent control in and around houses, specially, if heavy rodent infestation is present. Ventilation helps to remove aerosolized virus inside structures prior to cleanup. While cleaning infested structures, use rubber boots or disposable shoe covers; rubber or latex gloves; protective goggles. Use appropriate respiratory protection when infestations are severe.

Suggested disinfectant for housing facilities: Two types of disinfecting solutions are recommended to clean up rodent materials.

1. General-Purpose Household Disinfectant --- Prepare according to the label, if not prediluted. Almost any agent commercially available in US is sufficient as long as the label states that it is a disinfectant. Effective agents include those based on phenols, quaternary ammonium compounds, and hypochlorite.

2. Hypochlorite Solution (1:10 bleach solution) can be used in place of a commercial disinfectant. When using chlorine solution, avoid spilling the mixture on clothing or other items that might be damaged by bleach. Wear rubber, latex, vinyl, or nitrile gloves when preparing and using chlorine solutions. Chlorine solutions should be prepared fresh daily.

Notification: Request immediate notification of test results from the laboratory to the regional public health authority.

Measures required under the Animal Disease Surveillance Plan: Field researchers directly involved in disease ecology studies should follow the CDC guidelines for sampling small mammals for virologic testing (Mills et al., 1995).

Measures required for introducing animals to infected animal: Do not introduce infected animals to other places.

Conditions for restoring disease-free status after an outbreak: Thorough clean-up and disinfection and rodent control should be performed. Minimize contact of humans with rodents. Antibody surveillance in rodents and disease surveillance in humans.

Experts who may be consulted:
Centers for Disease Control and Prevention

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Viral Special Pathogens Branch
1600 Clifton Rd
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