

Hantavirus Pulmonary Syndrome

What is Hantavirus Pulmonary Syndrome

Hantavirus Pulmonary Syndrome (HPS) is a severe, sometimes fatal, respiratory disease in humans caused by infection with a hantavirus.

How is it Spread?

Hantaviruses are transmitted to people primarily through the aerosolization of tiny viruses shed from infected rodents' droppings, urine or saliva. Aerosolization occurs when a virus is kicked up into the air, making it easy to inhale. For example, a broom used to clean up mouse droppings in an attic may nudge into the air tiny particles of feces containing hantaviruses, which can then be easily inhaled.

After hantaviruses are inhaled, they reach the lungs and begin to invade tiny blood vessels called capillaries, eventually causing them to leak. The lungs then flood with fluid, which can trigger any of the respiratory problems associated with hantavirus pulmonary syndrome.

Rodents in the US That Carry Hantavirus



Deer Mouse - The Deer Mouse is a deceptively cute animal, with big eyes and ears. Its head and body measure approximately 2-3 inches in length, and the tail adds another 2 - 3 inches. In color, the deer mouse ranges from grey to reddish brown, depending on age. The underbelly is always white and the tail has clearly defined white sides. The hantavirus strain present in deer mice is Sin Nombre(SNV). The deer mouse is found throughout North America, preferring woodlands, but also appearing in desert areas.



Cotton Rat - The Cotton Rat found in the southeastern US and down into Central and South America, has a bigger body than the deer mouse. The head and body measure approximately 5 - 7 inches with another 3 - 4 inches for the tail. The fur is longer and coarser, grayish-brown, even grayish-black, in color. The hantavirus strain present in the cotton rat is Black Creek Canal virus (BCCV). The cotton rat inhabits overgrown areas with shrubs and tall grasses.



Rice Rat - The Rice Rat is slightly smaller than the cotton rat, with a 5 - 6 inch (7.5cm - 15cm) head and a very long 4 - 7 inch (10cm - 18cm) tail. It has short, soft, grayish-brown fur on top, and gray or tawny underbellies. Their feet are whitish. The rice rat prefers marshy areas and is semi-aquatic. The hantavirus strain present in the rice rat is Bayou virus (BAYV). It is found in the southeastern US and Central America.



White Footed Mouse - The White-footed mouse closely resembles the deer mouse. The head and body together measure approximately four inches. The tail is normally shorter than the body, typically 2 - 4 inches. Its top fur ranges from pale to reddish brown, while its underside and feet are white. The virus strain present in the white-footed mouse is New York virus (NYV). The white-footed mouse is found throughout southern New England and the Mid-Atlantic and southern states, the midwestern and western states, and Mexico. It prefers wooded and brushy areas, although it will sometime inhabit more open ground.

Signs and Symptoms

Early symptoms include fatigue, fever and muscle aches, especially in the large muscle groups such as thighs, hips, back, and sometimes shoulders. These symptoms are universal.

There may also be headaches, dizziness, chills, and abdominal problems, such as nausea, vomiting, diarrhea, and abdominal pain. About half of all HPS patients experience these symptoms.

Four to 10 days after the initial phase of illness, the late symptoms of HPS appear. These include coughing and shortness of breath, with the sensation of suffocation as the lungs fill with fluid.

Diagnosis and Treatment



Diagnosing HPS in an individual who has only been infected a few days is difficult, because early symptoms such as fever, muscle aches, and fatigue are easily confused with other influenza-like diseases. However, if the individual is experiencing fever and fatigue and has a history of potential rural rodent exposure, together with shortness of breath, would be strongly suggestive of HPS. If the individual is experiencing these symptoms they should see their physician immediately and mention their potential rodent exposure.

No virus-killing drug is effective against HPS. Mechanical ventilation or use of a respirator is the main treatment. Most patients need to be hospitalized in intensive care. The sooner an infected person gets medical treatment, the better the chance of recovery.

People at Risk

Unlike many illnesses that mainly strike people with weakened immune systems, HPS has hit mostly strong, healthy persons. Those who work, play, or live in closed spaces with active rodent infestation are at risk, although the chances of infection are low.

People who should take special precautions against HPS are:

- People who often handle or are exposed to rodents, such as wild life biologists and pest control workers.
- People who clean or work in attics or crawl spaces where rodents might be living and active.
- People who clean or renovate buildings that might be actively infested with rodents.

For these groups, CDC recommends wearing either a half-mask air purifying (or negative pressure) respirator or a powered air purifying respirator (PAPR) with N-100 filters.

Prevention

The Best way to prevent HPS is to avoid contact with rodents and to avoid inhaling dust that might be contaminated with rodent saliva, urine, or droppings. Rodent-proof the house by sealing cracks and clearing brush from around foundations. Eliminate possible nesting sites. Elevate hay, woodpiles and garbage cans, and place them away from the house. Keep campsites clean and food tightly sealed. Open up and air out outbuildings and rural or wilderness cabins before entering or cleaning.

Farmers and homeowners should use some basic precautions when cleaning indoor or outdoor areas that are heavily infested and may be contaminated with rodent saliva, urine, or droppings. Do not stir up and breathe dust. Before cleaning, wet down potentially contaminated areas with a household disinfectant (such as bleach or alcohol). While cleaning, wear rubber gloves, and disinfect them after use. Use of dust masks that cover the nose and mouth may be prudent. However, the CDC recommends that cleanup of heavily infested areas associated with known cases of HPS should be left to trained professionals.



For more sources of information on this topic visit:

ST. CLAIR COUNTY HEALTH DEPARTMENT www.scchealth.co

MICHIGAN DEPARTMENT OF HEALTH AND HUMAN SERVICES www.michigan.gov/mdhhs

CENTERS FOR DISEASE CONTROL AND PREVENTION www.cdc.gov