

# Hantavirus syndromes

Talebi-Taher M, MD  
Professor of Infectious Diseases  
IUMS  
15 Jun 2026



# Introduction:

---

- Infection with hantaviruses can cause a range of illnesses, including severe disease and death.
- The diseases vary by type of virus and geographical location.
- In the Americas, infection has been known to lead to hantavirus cardiopulmonary syndrome (HCPS), a rapidly progressive condition affecting the lungs and heart, while in Europe and Asia hantaviruses have been known to cause haemorrhagic fever with renal syndrome (HFRS), which primarily affects the kidneys and blood vessels.

# Transmission:

---

- Transmission of hantaviruses to humans occurs from contact with contaminated urine, droppings or saliva of infected rodents.
- Rodent bites.
- Activities that involve contact with rodents such as cleaning enclosed or poorly ventilated spaces, farming, forestry work and sleeping in rodent-infested dwellings increase exposure risk.

# Transmission:

---

- To date, human-to-human transmission has been documented only for *Andes* virus in the Americas and remains uncommon.
- Close and prolonged contact (household members or intimate partners).
- Most likely during the early phase of illness, when the virus is more transmissible.

# HPS should be suspected:

---

- Healthy adult with epidemiological risk factors or who lives in an endemic region develops unexplained pulmonary edema or ARDS without cause.



# Symptoms and clinical presentation:

---

- **Hantavirus pulmonary syndrome (HPS):**
- HPS is a severe and potentially deadly disease that affects the lungs.
- Symptoms of HPS usually start to show **1 to 8 weeks** after contact with an infected rodent.
- Prodromal stage: fever of sudden onset and generalized myalgia.

# Cont'

---

- Fatigue, Fever
- Muscle aches, especially in the large muscle groups like the thighs, hips, back, and sometimes shoulders.
- About half of all HPS patients also experience:
- Headaches, Dizziness, Chills
- Abdominal problems, like nausea, vomiting, diarrhea, and abdominal pain.

# Cont'

---

- **Four to 10 days(4-5 days) after the initial phase** of illness, the late symptoms of HPS appear.
- These symptoms include coughing and shortness of breath.
- Patients might experience tightness in the chest, as the lungs fill with fluid.
- HPS can be deadly.
- Thirty-eight percent of people who develop respiratory symptoms may die from the disease.

# Cont'

---

- Cardiopulmonary stage: fevere, tachycardia, tachypnea, and mild hypotension.
- Elevated HCT, leukocytosis, atypical lymphocytosis, decreased PLT.
- Increased Cr, proteinuria.

## cont'

---

- Respiratory involvement: mild hypoxia, pulmonary edema, and shock.
- Pulmonary vascular permeability.
- Vascular leak reverses in a few days and recovery is virtually complete.

# Cont'

---

- HPS pathology:
- Interstitial infiltrates of T lymphocyte and alveolar pulmonary edema without marked necrosis or PMN leukocyte involvement.



# Hemorrhagic fever with renal syndrome (HFRS)

---

- HFRS is a severe and sometimes deadly disease that affects the kidneys.
- Symptoms of HFRS usually develop within 1 to 2 weeks after exposure.
- In rare cases, they may take up to 8 weeks to develop(5-42days).
- Acute interstitial nephritis.

## Toxic stage:

---

- Intense headaches
- Back and abdominal pain
- Fever/chills
- Nausea
- Blurred vision
- Flushing of the face, inflammation or redness of the eyes, or a rash (petechiae).

# Cont'

---

- Leukocytosis: 20 000
- Decreased PLT
- Febrile stage 4-7 days
- shock, decreased BP
- RENAL failure
- Mucosal bleeding, pulmonary edema

# Cont'

---

- After 3-10 days :polyuric stage
- Mortality: 5 %
- 30%: during shock
- 70% :during renal stage

# Mild HFRS:

---

- ABDOMINAL pain and renal dysfunction.
- Pathogenesis: endothelial cells, capillary leak syndrome

# Cont'

---

- The severity of the disease varies depending on the virus causing the infection.
- Hantaan and Dobrava virus infections usually cause severe symptoms where 5-15% of cases are fatal.
- In contrast, Seoul, Saaremaa, and Puumala virus infections are usually more moderate with less than 1% dying from the disease.
- Complete recovery can take several weeks to months.

# Treatment:

---

- There is no specific treatment for hantavirus infection.
- Patients should receive supportive care, including rest, hydration, and treatment of symptoms.
- HPS can cause breathing difficulties, and patients may need breathing support, such as intubation.

# Cont'

---

- HFRS can disrupt kidney function.
- Patients with HFRS may need dialysis to remove toxins from the blood and maintain the right balance of fluids in the body when the kidneys aren't working well.

# Prevention and control:

---

- keeping homes and workplaces clean
- sealing openings that allow rodents to enter buildings
- storing food securely
- using safe cleaning practices in areas contaminated by rodents
- avoiding dry sweeping or vacuuming rodent droppings
- dampening of contaminated areas before cleaning
- strengthening hand hygiene practices.

# Cont'

---

- During outbreaks or when cases are suspected, early identification and isolation of cases, monitoring of close contacts, and application of standard infection prevention measures are important to limit further spread.

# Infection prevention and control in health-care settings

---

- Available evidence indicates that the risk of health-care associated transmission of hantavirus, including *Andes* virus, **is very low** when appropriate infection prevention and control measures are applied.
- In health-care environments, **standard precautions** should be applied for all patients, including hand hygiene, environmental cleaning and safe handling of blood and body fluids.

# Cont'

---

- For suspected or confirmed hantavirus infection, use of **standard precautions combined with transmission-based precautions** during provision of care is advised.
- For aerosol-generating procedures, **airborne** precautions should be used. Early recognition of suspected cases, prompt isolation, and consistent adherence to recommended infection prevention and control measures remain essential to protect health-care personnel.

# Key points:

---

- Hantaviruses are a family of viruses which can cause serious illnesses and death.
- These viruses cause diseases like hantavirus pulmonary syndrome (HPS) and hemorrhagic fever with renal syndrome (HFRS).
- They are spread mainly by rodents.
- The Andes virus is the only type of hantavirus that is known to spread person-to-person.
- This spread is usually limited to people who have close contact with the ill person.

