3.4 Hantavirus Pulmonary Syndrome

Case Definition

Confirmed Case

Clinical illness[2] with laboratory confirmation of infection:

- Detection of IgM antibodies to hantavirus

OR

- Detection of a significant (e.g., fourfold or greater) increase in hantavirus-specific IgG antibody titres

OR

- Detection of hantavirus RNA in an appropriate clinical specimen

OR

- Detection of hantavirus antigen by immunohistochemistry

Clinical Presentation

Infection with hantavirus is called Hantavirus Pulmonary Syndrome (HPS). Individuals usually experience fever, chills, occasional headaches, and sometimes gastrointestinal symptoms. Five days after the onset of initial symptoms, cough and shortness of breath typically develop and over the next 24 hours pulmonary edema and deterioration of cardiopulmonary function occur rapidly. Infection without symptoms is very rare. Patients presenting with severe illness due to HPS have a poor prognosis despite ICU care.

Diagnosis

Clinical signs and symptoms must be confirmed by laboratory findings.

Epidemiology

Occurrence

Hantavirus infection was first recognized in North America in 1993. Since then sporadic cases have been identified in the United States and in Canada. Since 1994 when active surveillance for HPS was initiated in Canada, the number of cases per year has fluctuated from a high of eight in 1994 to two cases in 1999. To date about 61 cases

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[2] Clinical illness is characterized by:

- a febrile illness {temperature > 38.3°C (101°F) oral} requiring supplemental oxygen

AND

- bilateral diffuse infiltrates (may resemble acute respiratory distress syndrome (ARDS))

AND

- develops within 72 hours of hospitalization in a previously healthy person
  OR
- An unexplained illness resulting in death with an autopsy examination demonstrating non-cardiogenic pulmonary edema without an identifiable specific cause of death

have been reported in Canada with at least 20 deaths. No human cases have been reported in Newfoundland and Labrador (NL).

Reservoir

The primary reservoir is the deer mouse. Antibodies have been found in other rodents such as in chipmunks and pack rats

Transmission

Human infection occurs most commonly through the inhalation of infectious, aerosolized saliva or excreta from rodents. Persons visiting laboratories where infected rodents were housed have been infected after only a few minutes of exposure to animal holding areas.

Transmission can occur when dried materials contaminated by rodent excreta are disturbed and inhaled, directly introduced into broken skin or conjunctivae, or possibly, when ingested in contaminated food or water. Persons have also acquired HPS after being bitten by rodents. High risk of exposure has been associated with entering or cleaning rodent-infested structures.

Incubation Period

The incubation period is thought to be approximately two weeks with a range of a few days to six weeks.

Communicability

There is no evidence of person to person transmission in North America.

Control Measures

Management of Case

There is no specific treatment or cure for hantavirus infection. Treatment of patients with HPS remains supportive. If there is a high degree of suspicion of HPS, patients should be immediately transferred to an emergency department or intensive care unit (ICU) for close monitoring and care.

Management of Contacts

Investigate contacts to determine if they have had the same exposure to HPS as the case. Provide education on the signs and symptoms of HPS and advise exposed contacts to seek medical care if symptoms develop.

Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

Education and Preventive Measures

The best approach for disease prevention and control is through environmental hygiene practices that discourage rodents from colonizing the home and work environment and that minimize aerosolisation and contact with HPS in salvia and excreta. Measures include:

- Preventing rodent exposure
  - Eliminate food sources available to rodents in structures used by humans
  - Limit possible nesting sites for rodents
  - Seal entrances for rodents in the home or cabin

- Safely cleaning up rodent infested areas
  - Ventilate enclosed areas before cleaning for 30 minutes or more
  - Wear an appropriate, well fitting NIOSH approved N 95 respirator, rubber gloves and goggles
  - Disturb the droppings and nesting materials as little as possible. Do *not* sweep before wetting the area and do not use a vacuum cleaner to remove them
  - Thoroughly and carefully wet contaminated areas with detergent to deactivate the virus. Wetting the area will prevent virus particles from being released into the air when material is disturbed during clean-up (do not use a sprayer)
    - Most general purpose disinfectants and household detergents are effective
    - Diluted bleach (one part bleach to 10 parts water) can be used
    - Wipe up droppings, nesting materials and other debris with a paper towel and place in a sealed plastic garbage bag
    - Double bag the contents and dispose as appropriate to local bylaws
    - Clean surfaces that were in contact with mice or their droppings with a solution of water and disinfectant
    - Wash rubber gloves with disinfectant *before removing them*
    - Wash your hands with soap and water after removing gloves
- Providing a fact sheet available at http://www.nr.gov.nl.ca/nr/agrifoods/animal/animal_health/pdf/ds_04_003_hantavirus_in_deer_mice.pdf

Reporting Requirements and Procedures

- Physicians, laboratories and communicable disease control nurses (CDCNs), and infection control practitioners (ICPs) must immediately report suspect or confirmed cases to the Regional Medical Officer of Health (RMOH)
- RMOH office will notify local physicians, nurse practitioners, environmental health officers, community health nurses, CDCNs, and ICPs, in the particular region as required for follow-up and case investigation
- RMOH reports to provincial office as per list B
- CDCN enters the case into the electronic reporting system and completes an outbreak report form if indicated
- Provincial Disease Control
  - Reports the aggregate case data to other health regions
  - Reports the identified case to Public Health Agency of Canada