

Hantaviruses

(Hantaan, Prospect hill, Puumala, Dobrava, Seoul, Sin Nombre, etc.)

Classification

RNA virus, enveloped

Family

Bunyaviridae

Affected species

Wild and laboratory rodents. These viruses are zoonotic.

Frequency

Rare in laboratory rodents, common in wild rodents in some areas.

Transmission

The virus is shed persistently in the feces, urine, and saliva of infected animals. Transmission is by direct contact or contact with the urine or feces of infected animals.

Clinical Signs and Lesions

There are generally no clinical signs in infected rats or mice. Hamsters and gerbils are susceptible to these agents and are used as models of human hantavirus infection. If human infection is suspected, see a physician immediately. In humans, hantaviruses may cause severe illness affecting either the kidneys and vascular system or the respiratory system.

Diagnosis

Diagnosis is through serology (ELISA, IFA, MFIA®). PCR is also available.

Interference with Research

The main interference with research is the zoonotic potential of this virus.

Prevention and Treatment

All rodents entering a research facility should be shown by testing to be free of hantaviruses. Wild and feral

rodents should be excluded from the facility. All murine products should be tested for the presence of viral contaminants before being used in mouse facilities. All biological products and transplantable tumors should also be tested before being introduced into the laboratory. PCR or antibody production testing are both efficacious means of testing biologic materials. Experimental animals containing tumor transplants, cell line, or murine-derived product injections should be housed away from breeding animals. Testing for antibodies to hantaviruses should be part of regular health monitoring of any laboratory rodent colony.

If infection with a hantavirus is diagnosed, all animals in the colony must be euthanized. If the source of infection is suspected to be a cell line or transplantable tumor, it must also be destroyed. The animal house must be cleaned and disinfected with gaseous formalin or some other sterilant such as vaporized hydrogen peroxide. All other animal house materials should be discarded as hazardous waste (incinerated) or autoclaved. Hantaviruses do not seem to be transmitted vertically. Hysterectomy rederivation is effective as is embryo transfer, if a valuable strain must be rescued. Extreme care must be taken in order to avoid infection of personnel with these viruses.

References

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