



Navigating Hantavirus Disease Clusters: Insights into Seoul Virus Transmission in Urban Environments

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DESCRIPTION

Hantavirus disease, caused by various Hantaviruses, is a group of infectious diseases primarily transmitted to humans through contact with rodent urine, feces, or saliva. While Hantaviruses are known to cause sporadic cases of disease, clusters of cases can occur in specific geographic regions or occupational settings, posing challenges for public health authorities in outbreak investigation and control. One such example is the Seoul virus, a member of the Hantavirus genus, which has been implicated in disease clusters among humans associated with rodent infestations, particularly in urban environments. The Seoul virus is primarily carried by brown rats, which serve as the primary reservoir host for the virus. Human infections typically occur through inhalation of aerosolized virus particles from contaminated rodent excreta or direct contact with infected rodents. While Seoul virus infections in rodents are usually asymptomatic, human infections can result in a spectrum of clinical manifestations ranging from mild febrile illness to more severe forms of acute respiratory distress syndrome (ARDS) and renal failure, collectively known as hantavirus pulmonary syndrome (HPS) or hemorrhagic fever with renal syndrome (HFRS) depending on the region and viral strain. Clusters of hantavirus disease caused by the Seoul virus have been documented in various parts of the world, with notable outbreaks reported in urban and peri-urban settings characterized by high rodent densities and close proximity between humans and rodents. Occupational groups at increased risk of Seoul virus infection include workers in pest control, sanitation, and waste management, as well as individuals living in impoverished urban areas with inadequate housing and sanitation infrastructure. Furthermore, the global expansion of urbanization and climate change-induced alterations in rodent habitats may contribute to the increased risk of Seoul virus transmission in urban environments. The investigation of Hantavirus disease clusters caused by the

Seoul virus entails a multifaceted approach encompassing epidemiological, clinical, and laboratory methods to identify the source of infection, characterize the transmission dynamics, and implement targeted control measures. Epidemiological investigations typically involve case identification, contact tracing, and retrospective analysis of potential risk factors such as occupational exposure, rodent infestations, and environmental conditions conducive to rodent proliferation. Clinical assessment of affected individuals is essential for early diagnosis and management of Hantavirus disease, particularly in severe cases requiring intensive care support. Laboratory confirmation of Seoul virus infection relies on serological assays such as enzyme-linked immunosorbent assays (ELISA) and molecular methods such as reverse transcription-polymerase chain reaction (RT-PCR) for detecting viral RNA in clinical specimens. Furthermore, viral sequencing and phylogenetic analysis are utilized to characterize viral strains and elucidate their genetic relatedness to other Hantavirus strains circulating in rodent populations. Preventive measures aimed at reducing the risk of Seoul virus transmission include rodent control strategies such as sanitation, rodent-proofing of buildings, and targeted use of rodenticides in high-risk areas. Additionally, public health education initiatives focusing on raising awareness about the risks of Hantavirus infection, proper hygiene practices, and early recognition of symptoms are essential for empowering communities to protect themselves from Seoul virus and other Hantavirus infections.

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CONFLICT OF INTEREST

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