漢他病毒腎症侯群與鼠類

Hantavirus hemorrhagic fever with renal syndrome and rodents

黃玉成

林口長庚醫院兒童感染科

Hantaviruses are enveloped tri-segmented negative-sense single-stranded RNA viruses that infect many species of rodents, shrews, moles and bats. Infection in these reservoir hosts is almost asymptomatic. Several rodent-borne hantaviruses cause two diseases that share many features in humans, hemorrhagic fever with renal syndrome (HFRS) in Eurasia or hantavirus cardiopulmonary syndrome in the Americas. Currently it is estimated that 150,000 to 200,000 cases of hantavirus disease occur each year, the majority being reported in Asia. It is thought that the immune response plays a significant contributory role in these diseases. However, in reservoir hosts that have been closely examined, little or no pathology occurs and infection is persistent despite evidence of adaptive immune responses. Hantavirus disease is characterized by vascular leakage due to increased capillary permeability.

Humans acquired infection primarily through the inhalation of aerosolized excreta from infected rodents and insectivores. Risk factors for infection include involvement in outdoor activities, such as rural- and forest-related activities, peridomestic rodent presence, exposure to potentially infected dust and outdoor military training; prolonged, intimate contact with infected individuals promotes transmission of Andes virus, the only Hantavirus known to be transmitted from human-to-human. Knowledge of the geographical distribution, regional incidence and associated risk factors of the disease are crucial for clinicians to suspect and diagnose infected individuals early on.

HFRS has pronounced renal dysfunction and less prominent respiratory involvement, with thrombocytopenia and hemorrhagic findings. Common symptomatology is due to underlying pathophysiology, mainly increased vascular permeability and immune activation. Laboratory and imaging markers predicting disease severity are under research. Diagnosis is presumptive, based on typical clinical findings and patient history of likely rodent exposure. Confirmation of diagnosis is by serological testing and/or RT-PCR. Treatment is mainly comprised of cardiovascular, respiratory, and renal function support, with fluid and electrolyte homeostasis being crucial components of care. Sequelae of HFRS, such as hemorrhage, acute renal failure, retroperitoneal edema, pancreatitis, pulmonary edema, and neurologic symptoms, can be detected by different imaging modalities. Medical

providers caring for HFRS patients must be aware of its radiologic features, which may help to confirm its clinical diagnosis.

Despite the high morbidity and case-fatality rates of HFRS and HCPS, respectively, no vaccine or drug is currently proven to be preventive or therapeutic. Climatic, ecological and environmental changes are related to fluctuations in rodent populations, and subsequently to human epidemics. Thus, prevention may be enhanced by host-reservoir control and human exposure prophylaxis interventions.