EPIZOOTIOLOGICAL SURVEYS OF HANTAVIRUS INFECTION AMONG INDIGENOUS RODENTS IN JAPAN

Shima YOSHIZUMI

Department of Veterinary Public Health
Faculty of Veterinary Medicine
Hokkaido University, Sapporo, Japan

Sero-epizootiological surveys of hantavirus infection among indigenous rodents were carried out using the protein G antibody (PGA) assay to elucidate the reservoir rodent species and enzootic areas of hantavirus infection. A total of 1,243 rodent sera were obtained from 5 indigenous rodent species (*Clethrionomys rufocanus, C. rutirus, Apodemus speciosus, A. argenteus and Eothenomys smithi*) captured in 14 areas of Hokkaido, 1 area of Aomori and 5 areas in Shimane prefecture. Seropositive cases were detected in sera from *C. rufocanus* in Hokkaido (39/557; 7.0%), from *A. speciosus* in Okushiri Island (3/16; 18.8%) near southwestern Hokkaido and from *A. spesiosus* in Aomori (1/34; 3.0%) in northern Honshu.

To identify the serotypes of the viruses infecting indigenous rodents, 7 seropositive sera from *C. rufocanus* were subjected to the focus reduction neutralization test (FRNT) with 4 serotypes of hantavirus (Hantaan, Seoul, Puumala and Prospect Hill). All the FRNT titers of the 7 sera positive to Puumala virus were extremely high. The titers to other viruses decreased in the order of Prospect Hill $>$ Hantaan $>$ Seoul. Anti-Puumala virus immune rabbit serum had a similar profile. This indicates that Puumala-related virus is circulating among *C. rufocanus* in Hokkaido.

In 2 seropositive sera of *A. speciosus* in Okushiri, all the FRNT titers to 4 hantavirus serotypes were $< 1:10$. However, the sera reacted with nucleocapsid protein of hantavirus by Western blotting. These results suggest that *A. speciosus* in Okushiri are infected with a hantavirus antigenically distinct from the viruses used in FRNT.

RNA samples from the lung tissues of *C. rufocanus* in Tobetsu, Hokkaido were subjected to reverse transcriptase polymerase chain reaction (RT-PCR) which amplifies the S genome RNA segment of hantavirus. The viral genomes were detected in 8 of 9 samples from seropositive *C. rufocanus*, indicating that the hantavirus was maintained in the lungs of the voles even in the presence of a specific antibody. These results imply the persistent infection of hantavirus in *C. rufocanus*.

To isolate the virus, the homogenates of the lung tissues from seropositive *C. rufocanus* in Tobetsu were inoculated into Vero E6 cells and suckling Syrian hamsters. However, virus isolation was unsuccessful by both methods.