

Notes on HANTOVIRUSES for Medical Professionals

Background

The Wellington branch of the Occupational Safety and Health Service, Department of Labour was contacted by the Public Health Service in regard to a ship which had arrived from Asia via Auckland, and which was found to have rats on board. "Were our port workers at risk from hantavirus?" they asked.

Hantaviruses

Hantavirus pulmonary syndrome (HPS) was first recognised in the USA in 1993, but retrospective analysis of tissue indicates that the disease occurred unrecognised as far back as the 1950s. Hantaviruses may also cause a haemorrhagic fever with renal syndrome, or hepatitis. These viruses are distributed all over the world, including New Zealand (personal communication from Dr Lance Jennings) with different serotypes predominating in different places.

The hantaviruses are carried by rodents mainly, although other small mammals may also carry the virus. The many different strains have widely divergent roles in human disease, e.g. the Sin Nombre virus which causes HPS in America has a tenfold higher mortality than its Eurasian counterparts (mortality about 50% with Sin Nombre). The Sin Nombre virus shares genetic similarities with non-pathogenic North American hantaviruses, and new serotypes are emerging that can also cause HPS.

Antibodies to hantavirus may be found in 5% of Swedes, 2 to 11% of Taiwanese, and 6% of Greeks, for example. In Singapore 26% of the rodents tested were positive, and in New York, on average, 12% were tested positive for hantavirus, although one year it was as high as 48% of those sampled. Nevertheless, cases of human disease are few, and they do not tend to cluster in those occupationally exposed to

rodents. A couple of American studies which have looked at utility workers (plumbers, electricians, etc.) or forest and park workers who come into frequent contact with rodents, found none to have hantavirus antibodies.

Human hantavirus infections are rare, although, doubtless, many go unrecognised. A 1997 study in China, for example, showed that 13 out of 83 patients with non-A-E hepatitis had antibodies to Hantaan virus. There were three cases reported to the Ministry of Health here in New Zealand, but further investigation of these cases cast doubt upon the diagnosis. Of interest, they were all farm dwellers and had leptospirosis-like symptoms with negative tests for leptospirosis.

The Communicable Disease Centre (ESR Kenepuru Science Centre) are unaware of any other cases of hantavirus, but it is likely that hantavirus studies are not requested by clinicians who would regard it as a rare disease that only occurs overseas, and the tests are not able to be performed in this country.

The virus is believed to be transmitted by rodent saliva or excreta, especially when inhaled in aerosol form, i.e. when dry or fresh material contaminated by rodent excreta is disturbed, but it is also possible to be infected through broken skin or mucosa, or by being bitten. Human to human transmission is unlikely.

Hazard Control

Although human hantavirus infection is rare, the Center for Disease Control (Atlanta), nevertheless, make a number of recommendations, and these might be regarded as excessive.

The following is a much condensed version of their recommendations which would be appropriate for reducing the (unknown but small) risk of hantavirus, as well as the rather more likely risk of leptospirosis:

- Use traps and rodenticides to eliminate rodents from workplaces. Disinfect traps after use with household bleach.
- Use raised cement foundations in the construction of sheds, barns and out-buildings.
- Elevate woodpiles at least 12 inches off the ground.
- Store grains and animal feed in rodent-proof containers.
- Store hay on pallets, or otherwise elevate above ground or floor level where possible.
- Remove trash, abandoned vehicles, discarded tyres, etc. which may serve as rodent nesting sites.
- Before going into a rodent-infested building, which has been closed for some time, ensure adequate ventilation.
- Wear rubber or plastic gloves when handling dead rodents. Put the carcass in a plastic bag containing enough general-purpose household disinfectant to wet the carcass. Burn or

bury the carcass. Wash gloves in household disinfectant, and then wash the hands in soap and water.

- In rodent-infested areas mop the floors with disinfectant and wipe surfaces with household disinfectant.
- Workers who develop a febrile or respiratory illness or jaundice within 45 days of exposure should seek medical advice and notify the physician of the possibility of hantavirus infection or leptospirosis.

Symptoms

Symptoms of hantavirus infection vary according to the serotype of the virus. In Europe and Asia the haemorrhagic fever with renal syndrome occurs (fever, headache, fatigue, gastrointestinal dysfunction, thrombocytopenia and proteinuria). In Asia the infection may also present as a hepatitis. HPS in America begins with fever, muscular aches, headache and cough, and progresses to a severe pulmonary disease like adult respiratory distress syndrome.