



2013-03-20-005 Seoul virus - United Kingdom: (England) 1st detection
To: (06) Virology, general;

SEOUL VIRUS - UNITED KINGDOM: (ENGLAND) FIRST DETECTION

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<<http://www.hpa.org.uk/hpr/archives/2013/news0113.htm#hntseov>>

Hantavirus in England: detection of a UK strain of Seoul virus in wild brown rats (*Rattus norvegicus*)

Hantaviruses (genus *Hantavirus*, family *Bunyaviridae*) are a group of rodent-borne viruses with a wide global distribution. There are more than 40 recognised species of hantavirus and each species appears to be specific to a different host, and therefore limited to the host distribution [1]. At least 21 hantaviruses are confirmed to be human pathogens, 4 of which are known to occur in Europe (table 1) [2].

Human infection most often occurs when breathing in dried aerosolised excreta from infected rodents however the direct introduction into broken skin or conjunctiva is also a possible route of transmission. Disease in humans was 1st recognised in Korea in the early 1950's, although the virus was not identified until 1976 [3]. 2 clinical syndromes are associated with severe disease [2]: haemorrhagic fever with renal syndrome (HFRS) in Europe and Asia caused predominantly by infection with Hantaan virus (HTNV), Dobrava virus (DOBV), Saaremaa virus (SAAV), Seoul virus (SEOV) and Puumala virus (PUUV); and, hantavirus cardiopulmonary syndrome (HCPS) in the Americas caused predominantly by infection with serotypes Sin Nombre virus (SNV) and Andes virus (ANDV). The majority of hantavirus infections in humans are likely to be asymptomatic or present with mild and non-specific symptoms including fever, headache, blurred vision, gastrointestinal symptoms and back pain.

Known types of hantavirus associated with disease in Europe [4]

Virus / Disease / Distribution / Host species DOBV / Severe / Eastern Europe / *Apodemus flavicollis* / PUUV / Mild / Europe / *Myodes glareolus* / SAAV / Moderate / Europe / *Apodemus agrarius* / SEOV / Moderate / Worldwide / *Rattus norvegicus*

Hantavirus is notifiable in England and Wales. Laboratory confirmation of acute cases is provided by the Rare and Imported Pathogens Laboratory (RIPL), HPA Microbiology Services Porton. Between 2009 and 2010 there were 2 confirmed cases with no travel history recorded: one from London and one from the Yorkshire and the Humber region. In January 2012, a 2nd confirmed autochthonous case from Yorkshire and the Humber was reported with high titres (>10 000) and symptoms consistent with hantavirus infection (RIPL data).

Following the detection of a 2nd case in the Yorkshire and the Humber region, in collaboration with North Yorkshire and the Humber Health Protection Unit and the HPA's Rare and Imported Pathogens Laboratory (RIPL), an investigation led by Virology and Pathogenesis, HPA Microbiology Services Porton was undertaken. Trapping and testing of rodents from the patient's home led to the detection of the 1st UK strain of hantavirus in wild *Rattus norvegicus* (brown rat) [5].

Further collaboration with the National Collection of Pathogenic Viruses (NCPV), Microbiology Services Porton, led to the culture and isolation of the virus now designated strain 'Humber.' Complete sequencing and genetic analysis confirmed the virus was a Seoul hantavirus.

Due to the high levels of cross-reactivity between hantavirus species and the lack of viral detection in any published UK study, it has previously been impossible to confirm and identify the presence of a hantavirus in the United Kingdom. Cases are likely to be under-reported due to mild cases presenting with non-specific symptoms and a lack of awareness of hantavirus as a potential diagnosis in the absence of travel. Given that *R. norvegicus* are ubiquitous in the UK, research is ongoing to determine the extent of human exposure to this virus.



Further information on hantaviruses can be found on the HPA website [6]. This article is a contribution from Microbiology Research Services, HPA Porton.

References

1. Dearing MD, and Dizney L (2010). Ecology of hantavirus in a changing world. *Annals NY Acad Sci* 1195, 99-112.
2. Jonsson CB, Figueiredo LTM, Vapalahati O (2010). A global perspective on hantavirus ecology epidemiology and disease. *Clin Micro Rev* 23, 412-41.
3. Lee HW, Lee PW, Johnson KM (1978). Isolation of the etiologic agent of Korean Hemorrhagic fever. *J Infect Dis* 137, 298.
4. Vaheri A, Henttonen H, Voutilainen L, Mustonen J, Sironen T, Vapalahti O (2012). Hantavirus infections in Europe and their impact on public health. *Rev Med Virol* doi: 10.1002/rmv.1722.
5. Jameson LJ, Logue CH, Atkinson B, Baker N, Galbraith SE, Carroll MW, et al (2013). The continued emergence of hantaviruses: isolation of a UK Seoul virus implicated in human disease, United Kingdom, October 2012. *Euro Surveill.* 18(3).
6. HPA. Hantaviruses. HPA website: <<http://www.hpa.org.uk/>>

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[Although hantaviruses are globally distributed, this is the 1st detection of a hantavirus in the United Kingdom. The majority of hantavirus infections in humans are likely to be asymptomatic or present with mild and non-specific symptoms including fever, headache, blurred vision, gastrointestinal symptoms and back pain. The 1st 2 confirmed case of hantavirus infection in the United Kingdom had no travel histories and were located in London and the Humber region of Yorkshire, places where the indigenous brown rats might contact international trade routes. It is likely the introduced Seoul virus will gradually spread throughout the rest of the United Kingdom.

A map showing the location of the Humber region of England can be accessed at:
<<http://www.ons.gov.uk/ons/rel/regional-trends/region-and-country-profiles/key-statistics-and-profiles--august-2012/key-statistics---yorkshire-and-the-humber.html>>.
Mod.CP]

[The appearance of Seoul virus in England is not surprising, given its wide distribution around the world and the propensity of brown rats to move along routes of international commerce, most often by cargo ships, which accounts for the presence of Seoul virus in brown rats in port cities. Further movement around the UK can be expected. - Mod.TY]

[see also:
2012

Hantavirus update 2012 - Europe: Germany, Slovenia 20120525.1144830
2011

Hemorrhagic fever w/renal syndrome - Russia: (BN) 20110423.1274 2010

Hemorrhagic fever w/renal syndrome - Russia (06): Moscow oblast
20100926.3491

Hantavirus update 2010 - Europe (05): Germany 20100809.2719]