Hantavirus in England

A sero-surveillance study undertaken by Public Health England, Porton Down

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Rare & Imported Pathogens Laboratory

• **Public Health England**
  • 3000 staff in 18 locations

• **Porton Down**
  • Research facility
  • RIPL – Diagnostic Service
    • Biological warfare agents e.g. Anthrax
    • Rare endemic pathogens e.g. Lyme disease
    • Imported pathogens e.g. VHF, Dengue
What are Hantaviruses?

Group of viruses found worldwide
- Old world (Europe and Asia) – HFRS
- New world (N and S America) – HCPS

Disease first identified in UN troops in Korea in 1951
- Virus not isolated until 1976

Hantaviruses are naturally carried by rodents
- Asymptomatic
- Shed virus++ in their urine, faeces, and saliva

Humans become infected
- Direct contact by handling rodents/biting
- Indirectly via inhalation of virus in aerosolised excreta
Old world (Europe & Asia) rodents & viruses

*Clethrionomys glareolus*
Bank vole
Puumula virus
Tula virus

*Rattus norvegicus*
Brown rat
Seoul virus

*Apodemus peninsulæ*
Korean field mouse
Amur virus

*Apodemus flavidollis*
Yellow necked field mouse
Dobrava-Belgrade virus

*Apodemus agrarius*
Striped field mouse
Hantaan virus
Saaremaa virus
Clinical disease

Incubation period

1 – 6 weeks

flu-like illness

3 – 10 days

Hantavirus
Cardio- Pulmonary Syndrome
Pneumonia

Haemorrhagic Fever with Renal Syndrome
Renal disease
Diagnosis
UK Hantavirus in wild rats

January 2012

• 48 year old Yorkshire farmer
  • Fever and acute kidney injury
  • Tx for Leptospirosis
  • IgG +ve Seoul Hantavirus (1:10,000)

• Farm infested with rats (recent increase)
  • 2/4 rats were PCR +ve (1/2 virus isolated)
  • No +ve from wood mice or bank voles

• Variant of Seoul virus named Humber
UK Hantavirus in pet rats

• January 2013
  • 28 year old male (diabetic)
  • 4/7 hx of flu-like illness
  • Admitted with haemorrhagic fever & AKI → ITU
  • Ventilated for 38/7 & renal support for 21/7
  • IgG +ve for Seoul Hantavirus (1:10,000)

• Girlfriend kept two pet rats
  • Girlfriend was seronegative
  • Rats – both PCR positive in blood & urine → PTS → PCR +ve lung tissue
  • Varient of Seoul Hantavirus named Cherwell

• Rat breeder
  • IgG +ve for Seoul Hantavirus (1:100)
  • Breeders husband IgG +ve for Seoul Hantavirus (1:10,000)
PHE study

Aim

• Investigate sero-prevalence in high risk groups
• Inform future risk assessments, and allow public health guidelines to be established

Design

Asked to give a blood sample for testing for Hantavirus antibodies, and to fill in a questionnaire.

• (1) Control group – random donors (purchased from National Blood Transfusion Service)
• (2) Pet rat owners
• (3) Occupational exposure to pet rats – Veterinary personnel
• (4) Occupational exposure to wild rats – Farmers, pest control workers, sewage workers
## Results

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<th>Seroprevalence (%)</th>
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Outcomes & further work

• Existing leaflet gives sufficient advice

• 450 rat urine collection kits handed out (80 returned), currently being tested at AHVLA

• More work needed with pet rat owners to establish prevalence i.e. fancy rat breeding / showing, and single pets
Acknowledgements

Dr Jackie Duggan
Dr Christopher Logue
Lisa Jameson
All of the people who took part in the study
NHS Fife