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First detection of human hantavirus infection transmitted by a pet rat

For the first time, Seoul virus could be identified as the cause of hantavirus disease in a German patient. The joint study of the National Consiliary Laboratory for Hantaviruses (human medicine) of the Charité – Universitätsmedizin Berlin, together with clinicians and laboratory physicians, local and regional health authorities and the National Reference Laboratory for Hantaviruses (veterinary medicine) at the Friedrich-Loeffler-Institut (FLI) has now been published in the journal Emerging Infectious Diseases.

The young woman needed intensive medical care and showed symptoms of acute kidney failure, which indicated hantavirus disease. Serological examinations confirmed this suspicion, but did not allow the identification of the causative virus. Molecular analysis subsequently carried out by the Consiliary Laboratory for Hantaviruses led to the first description of an autochthonous Seoul virus infection in Germany.

Within the framework of the network “Rat-borne pathogens” supported by the German Center for Infection Research (DZIF), the FLI group examined a pet rat that the patient from Lower Saxony had purchased about two to three weeks before the onset of her disease. Molecular biological investigations led to the detection of Seoul virus RNA, whose sequence was identical to the sequence of the Seoul virus detected in the patient. “This result thus provided clear molecular epidemiological evidence that the patient’s infection had been caused by a pet rat”, said Prof. Ulrich, head of the National Reference Laboratory for Hantaviruses at FLI.

The results of this study demonstrate the value of the One Health approach in the elucidation of the occurrence of (seemingly) novel pathogens. Follow-up examinations will be carried out to identify the exact origin of the pet rat as well as that of the detected pathogen. For this purpose, further investigations of pet and wild rats are planned. A few years ago, a series of cases of disease occurred which had been caused by cowpox virus transmitted by pet rats. “The detection of another zoonotic agent in pet rats underlines once again the necessity to monitor pet rats for the presence of zoonotic pathogens”, emphasizes Prof. Ulrich.

Hantaviruses have been known in Germany for many years and cause a notifiable human disease, which in severe cases can lead to kidney failure. The majority of human cases of disease, which in certain years occur in increased numbers, are caused by Puumala virus, with the bank vole as reservoir host. Furthermore, human infections with Dobrava-Belgrade virus have been described in Germany. While Puumala virus occurs exclusively in the western part of Germany, the spread of Dobrava-Belgrade virus is limited to the eastern part due to the occurrence of the striped field mouse as reservoir host. So far, molecular detection of Seoul virus in Germany has not been successful, although the pathogen has been detected in wild and pet rats in various European countries and some cases of human disease have been described in Europe.

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