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Usutu Virus Infections

Susceptible species

The main hosts of Usutu Virus (USUV) are wild birds which as a rule do not develop disease. However there also are bird species, e.g. blackbirds and owls, which are highly susceptible to infection.

Humans and horses are dead-end hosts of this disease, human infections are very rare. So far, human disease with clinical symptoms (fever, headache, skin rash, encephalitis) has been detected in two elderly immunosuppressed patients in Italy and in one patient in Croatia. In Germany, antibodies against the virus have been detected in one healthy blood donor in Southern Germany.

Distribution area

USUV has its origin in Africa (named after a river in Swaziland) and was for a long time considered to be of importance in Africa only; an associated bird die-off was not observed. Retrospective studies from Italy however have shown that the virus very likely first occurred in Europe in 1996 or earlier. For Central Europe there have been five well documented USUV outbreaks so far (Austria 2001-2003, Hungary 2005-2006, Switzerland 2006-2009, Italy 2006-2008, Germany since 2011), which caused regionally and temporarily limited bird die-offs, mainly in wild songbirds and owls kept in captivity. Meanwhile the virus is able to survive in mosquitos even in cold winters and has established permanently in Central Europe.

Causative agent

The USUV (enveloped, single-stranded RNA virus) is closely related to two other viruses within the *Flaviviridae* family: the West-Nile Virus (WNV), which has been present in Southern and Southeastern Europe for some time, and the Japan Encephalitis Virus, which is endemic in Asia. Within the genus *Flavivirus* USUV as well as West-Nile and Japan Encephalitis Virus belong to a group of pathogens called the Japan Encephalitis Serocomplex which cause human cases of encephalitis.

Transmission

USUV is transmitted by mosquito species specialized on birds (ornithophilic mosquitos) with *Culex* mosquitos as main vectors. A multitude of wild birds serve as natural hosts and the virus is kept alive through a bird-mosquito-cycle.

Clinical Picture (animal)

In most birds USUV infection is asymptomatic; in highly susceptible bird species however, such as blackbirds or great grey owls, often distinctive clinical symptoms and death may occur. Initially, the animals show ruffled feathers at the head and neck and discoloration which may progress to partial or complete baldness of the head, followed by apathy and central nervous disorders such as tumbling or twisting of the head.

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In horses in Croatia, Italy and Serbia, only USUV-specific antibodies have been detected so far; no clinical symptoms in horses have been observed in Europe.

Diagnostics

Specific diagnostics consist of virus genome detection in the blood, which however is only possible during the first days after infection. Furthermore, USUV specific antibodies can be determined in the blood.

Similar clinical pictures

In neurological human disease in areas with a high wild bird mortality, patients should be investigated for USUV, WNV and other causative agents of encephalitis.

Birds showing central nervous symptoms also should be investigated for WNV infection or avian Bornavirus infections.

Control

Usutu Virus infections are neither notifiable nor reportable so far.

General methods for protection from insect bites, such as appropriate clothing, repellants and mosquito nets are recommended.

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