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ANIMAL HEALTHSPECIAL REPORT

H5N1 in cats

Introduction

At the end of February 2006 highly pathogenic avian influenza (HPAI), caused by the H5N1 virus was detected in a domestic cat found dead on the northern island of Ruegen, Germany. Since mid-February, over 100 birds have died on this island and tests confirmed H5N1 infection. Also in Asia, cats and other felidae are occasionally found to be infected with H5N1 since the start of the poultry epidemic end 2003. Experimental studies have shown that the domestic cat can become infected with the virus and that cat to cat transmission is possible in principle. Serological studies in several Asian countries suggest that dogs may also contract the H5N1 infection. Countries in Europe have advised owners of pets living near H5N1 wild bird foci to keep cats indoors and dogs on a leash when taken for a walk.

These recent events lead to many questions by the public and pet owners to which the veterinary profession has to respond. In addition, there may be exposure of pet owners and veterinarians. For example, when animals infected with H5N1 (eg birds, dogs and cats) are brought to the veterinary clinic. Important are also the contribution veterinary practitioners can make in the surveillance of the disease for the presence of the H5N1 infection.

This section provides information for the general public and professionals about the risk of cats contracting H5N1 virus and the role of cats in the spread of avian influenza H5N1.

Background

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During a H5N1 outbreak in poultry in 1997 in Hong Kong, the first clinical human cases of this sub-type were reported with several fatalities. From the end of 2003 to date (March 2006) 173 people have been confirmed infected with the H5N1 virus of which 93 have died. Except for 1 case, human-to-human transmission has probably not occurred. Although H5N1 is relatively common to wild birds and poultry, humans and other mammals are also at risk of HPAI infection. Highly pathogenic avian influenza in poultry is of growing concern due to the current geographic extent comprising Asia, Africa and Europe showing potential for pandemic spread. The virus is highly contagious and already over 200 million domestic birds have either been culled or died of the disease. Table 1 shows the timeline for avian influenza in cats and other felidae.

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Timeline of (H5N1) avian influenza in cats and other felidae (and civets)	
1970s & 1980s	Research revealed that infection of domestic cats with influenza A subtypes H3N2 from humans, H7N3 from a turkey, and H7N7 from a harbor seal (<i>Phoc vitulina</i>) produces transient virus excretion and a temporary increase in body temperature but did not induce any other clinical signs of disease.
December 2003	Two leopards and two tigers died at a zoo in Thailand after feeding on chicken carcasses. Investigation confirmed H5N1 in tissue samples from all 4 animals. This was the first report of influenza causing disease and death in big cats.
September 2004	Research shows that domestic cats experimentally infected with H5N1 develop severe disease and can spread infection to other cats.
October 2004	A H5N1 outbreak in zoo tigers in Thailand reportedly fed on chicken carcasses. Eventually, 147 out of the population of 441 tigers died or had to be euthanized for animal welfare reasons.
June 2005	Tests on three civets that died late June 2005 in Viet Nam revealed H5N1, marking the first infection of this species with the virus. These endangered Owston's palm civets were raised in captivity; source of infection is still unknown.
October 05 February 06	FAO field veterinarians report unusual high cat mortality in Iraq and Indonesia in the vicinity of H5N1 outbreaks in poultry.
28 February 2006	H5N1 confirmed in a cat on the Baltic Sea island of Ruegen (Germany). Over 100 wild birds had been found dead on the island during previous weeks.

General Information

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Role of cats in virus transmission Research has shown that domestic cats may die from H5N1 virus. Also horizontal transmission has been proven. However, it is unlikely that cats play a role in the natural transmission cycle of H5N1 viruses. Cat infections occasionally occur in association with H5N1 outbreaks in domestic or wild birds, e.g. when cats feed on infected birds. Experimental/infected cats shed the virus via the respiratory and intestinal tract, and may therefore transmit the virus to other cats. Naturally infected cats are thus in theory, able to spread the virus

In areas where H5N1 Infected wild birds are reported it can not be excluded that cats become infected. Although most wild birds infected are waterfowl, not normally the species cats interact with, H5N1 is potentially infectious to numerous other bird species and it can not be ruled out that passerines or pigeons which do interact with cats get infected

In areas where poultry is infected with H5N1 there is a risk that cats become infected with H5N1 through contact with infected poultry or their faeces. Anecdotal reports support the notion that contact with infected poultry (faeces and eating infected carcasses) forms a source of infection for cats. Cats probably have little or no contribution to the spread of the disease because the number of infected poultry is much higher than the number of infected cats; poultry shed much more virus than cats. Nevertheless, cats may play a role in the spread of the virus to other animals. Report to the local veterinary authority any evidence of significant animal mortality both wild and domestic.

Theoretically there is a possibility that cats transmit infection to humans. However, given the risk that cats become infected with HPAI is low, the risk to human infection is therefore limited.

The role of stray cats

Due to their greater mobility, stray cats could spread the disease into new areas. If infected, stray cats may become a source of contamination to poultry and mammals, including humans.

The role of other mammals

The ability of catching the H5N1 virus is not restricted to cats. Reports show infection in tigers, leopards and civets. Also dogs and pigs may become infected with the virus. Given the broad host spectrum of the H5N1 virus, the possibility that also other wild or domesticated mammals including seals, mustelidae or furbearing animals, become infected by contacting infected animals is present. All carnivores could become infected through eating infected poultry or infected wild birds.

Recommendations

Areas where H5N1 HPAI has been diagnosed or is suspected in poultry or wild birds:

- Report to the local veterinary authority any evidence of significant bird mortality both wild and domestic

- Be especially vigilant for any dead or sick cats and report such findings to the local vet

- Make sure contact between cats and wild birds or poultry (or their faeces) is avoided and/or keep cats inside

- If cats bring a sick or dead bird inside the house, put on plastic gloves and dispense of the bird in plastic bags for collection by local veterinary animal handlers

- Keep stray cats outside the house and avoid contact with them

- If cats show breathing problems or nasal discharge, a veterinarian should be consulted

- Do not touch or handle any sick-looking or dead cat (or other animal) and report to the authorities

Wash hands with water and soap regularly and especially after handling animals and cleaning their litter boxes or coming in contact with faeces or saliva
Dogs can only be taken outside the premises if kept restraint
Do not feed any water birds
Disinfect (e.g. with bleach 2-3 %) cages or other hardware with which sick animals have been transported or been in contact with.
Wash animal blankets with soap or any other commercial detergent

Information for veterinarians

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Avian influenza in other animal species

Hosts: Wildbird hosts for H5N1 in order of importance are probably Anatidae (ducks, geese, swans), Charadriiform (gulls and shorebirds) and Passeriform (sparrows and starling). Lately swans have been found infected with H5N1 in a number of European countries (e.g. Austria, Germany, France and Romania, etc.). In poultry, both aquatic and terrestrial species become infected but the virus is particularly aggressive in chicken.

Carnivores: can become infected, after consuming infected poultry that succumbed to the disease. To date no H5N1 clinical cases of dogs have been reported but in an unpublished study carried out in 2005 by the National Institute of Animal Health in Bangkok, researchers tested 629 village dogs and 111 cats in the Suphan Buri district of central Thailand. Out of these, 160 dogs and 8 cats had antibodies to H5N1, indicating that they were infected with the virus or had been infected in the past. An equine virus has recently shown up in dogs. This inter-species re-assortment is not uncommon for type A influenza viruses.

Pigs are known „mixing vessels“ for different influenza virus subtypes and therefore present a risk for avian influenza virus re-asserting with a human influenza virus into a strain more apt to infect humans. Regarding the present H5N1 subtype, studies conducted in pigs in Vietnam yielded 8 animals out of the 3000 investigated pigs seropositive. None of the animals had any clinical signs and it was not possible to isolate any virus

Ruminants appear at lower risk. So far no cattle have been identified as carrying any influenza type A virus. Horses are susceptible to Influenza viruses but so far mainly H3N8 have been identified. Regular vaccination is carried out. Experimentally mice can be infected but their role in natural transmission has not been established.

Public health implications

Humans and other mammals need to come in contact with large amounts of virus to become infected. In case of an infection with H5N1, mammals and humans apparently only shed small amounts of virus, contributing to reduced risk of spread among themselves. Recent data from experimentally infected cats' evidenced extra-respiratory replication of the H5N1 and excretion of virus in faeces of cats need to be taken into consideration. Hygienic practices need to be reinforced, frequent washing of hands with water and soap especially after handling animals, cleaning cat litter boxes as well as before and after the preparation of food.

Occupational health and safety

Veterinarians and their staff are specifically at risk of coming into contact with infected cats, in

case the disease becomes more widespread among this species. Normally, veterinarians and their staff engage in frequent hand washing and disinfect examination tables and instruments to reduce the general risk of disease transmission among their patients and to protect the persons present in the consultation room from eventual exposure.

Advice for veterinarians

The following is advised for veterinarians:

Advice to pet owners (see above)

Be ware of possibility to receive (sick) cats infected with H5N1

Take hygienic measures when handling sick cats (gloves and surgical masks)

Take deep oro-pharyngeal swabs of suspected animals (e.g. animals with respiratory problems) and sent them to the laboratory clearly indicating the type of examination requested Support cases to be reported to veterinary authorities

Inform owners of suspected animals and provide them with clear and practical information, avoiding creating any panic among cat owners or the general public.

Provide veterinarians are advised to contact the Veterinary Authorities in their respective countries for specific instructions

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Comments: AGA-Webmaster