

Avian influenza H₅N₁

ABCD recommendations on the practical approach of infected and suspected cats

The background information and practical guidelines were compiled by Etienne Thiry (Liege/B), with the assistance of Diane Addie (Glasgow/UK), Herman Egberink (Utrecht/NL), Katrin Hartmann (Munich/D), Hans Lutz (Zurich/CH) and Hervé Poulet (Lyon/F), members of the ABCD task force on avian influenza.

ABCD is an independent Board set up to compile guidelines for the prevention and management of major feline infectious disease in Europe. Animal health care company Merial helped set up and financially supports the ABCD.

The recently created Advisory Board on Cat Diseases (ABCD) set up a task force early March to collect information draw up guidelines for veterinary practitioners when confronted with a suspect case of H₅N₁ in cats.

Infection of cats

Felids can be naturally and experimentally infected with H₅N₁ virus. The first experimental evidence for the pathogenicity of the virus for the domestic cat was found in 2004¹. In February 2004, infection of household cats was reported from Thailand². In the same country, two outbreaks of fatal disease in tigers and leopards have also been published³.

In late February / early March of this year, three cats were found dead on the island of Rügen, Germany and infection with H₅N₁ virus was established by laboratory tests. Also in March, three cats were found infected but alive in an animal shelter in Graz, Austria.

Cats, but also ferrets, rats and rabbits...

The H₅N₁ subtype of Avian Influenza Virus type A, a member of the Orthomyxoviridae family, occurs primarily in birds. Transmission to mammals happens sporadically, and the infection then may cause disease with a high morbidity and a high number of deaths among ill animals. Humans, primates, rodents, lagomorphs, mustelids and felids, including the domestic cat may be infected and may succumb to the disease⁴.

... and humans?

A statement from the WHO (dated 28th February 2006) reads: *“There is no present evidence that domestic cats play a role in the transmission cycle of H₅N₁ viruses. To date, no human case has been linked to exposure to a diseased cat. No outbreaks in domestic cats have been reported. Unlike the case in domestic and wild birds, there*

¹ Kuiken et al. Avian H5N1 influenza in cats. *Science*, 2004, 306, 241.

² WHO, Avian influenza A (H5N1) – update 28: reports of infection in domestic cats, 20 February 2004

³ Keawcharoen et al., Avian influenza H5N1 in tigers and leopards. *Emerg. Infect. Dis.*, 2004, 10, 2189-2191 ; and Thanawongnuwech et al., Probable tiger-to-tiger transmission of avian influenza H5N1. *Emerg. Infect. Dis.*, 2005, 11, 699-701.

⁴ A listing of susceptible species is given at :

http://www.nwhc.usgs.gov/disease_information/avian_influenza/affected_species_chart.jsp

is no evidence that domestic cats are a reservoir of the virus. All available evidence indicates that cat infections occur in association with H₅N₁ outbreaks in domestic or wild birds.”

What do we know?

The following data have been obtained from experimental infections⁵. They reflect the current state of knowledge and will have to be revised and expanded, as additional information becomes available:

- cats can be infected via the intratracheal and oral routes, and by feeding on infected chickens;
- infection can occur through contact with infected birds;
- infected cats can transmit the virus to in-contact cats;
- moderate amounts of virus are sufficient to infect a cat;
- the virus is shed with nasal secretions and in faeces; nasal excretion starts 3 days after infection and continues for 4 days or more;
- the incubation period in experimental infections is about 2 days;
- clinical signs are fever, lethargy/depression, dyspnoea, and conjunctivitis; when clinical signs occur, the outcome of the disease is mostly fatal within one week. Icterus has also been observed.
- at necropsy, multifocal lung lesions and petechial haemorrhages in the tonsils, mandibular and retropharyngeal lymph nodes, and the liver are seen;
- at histology, inflammatory and necrotic lesions are found in the lungs, heart, brain, kidneys, liver and adrenal glands. Lesions in the small intestine are observed in cats that had been fed infected chickens.

Risk considerations – questions and answers

1. How can cats become infected?

Precondition is that the cat lives in a region where one or more H₅N₁ -virus infected birds have been identified by laboratory tests; if this condition applies, the following risk factors must be considered:

- the cat lives in an environment where waterfowl are present;
- the cat has access to outdoors;
- the cat has contact with free-range or indoor poultry;
- the cat has been fed uncooked poultry meat.
- the cat has been in close contact with an H₅N₁ –infected cat.

2. How can a cat be infected by another cat?

Close contact with an H₅N₁ -infected, sick cat is required at least during the first seven days of infection; although inapparent infection might occur for a limited period, persistent H₅N₁ -virus infections have not been reported.

3. How may a cat transmit the infection to a person?

To date (May 2006), no virus transmission from a cat to a person has been reported.

However, it should be remembered that:

⁵ Kuiken et al. *Avian H5N1 influenza in cats. Science, 2004, 306, 241 ; and Rimmelzwaan et al. Influenza A virus (H5N1) infection in cats causes systemic disease with potential novel routes of virus spread within and between hosts. Am. J. Pathol., 2006, 168, 176-183.*

- a H₅N₁ -virus which has infected a cat is already adapted to a mammalian species; viruses isolated from humans exhibited increased virulence for mammals⁶;
- the virus is excreted by the respiratory route and in the faeces;
- the level of excretion is high enough to allow in-contact cats to become infected;
- in view of the habitual close contacts between cats and their owners, an infected cat can probably infect a human;
- the risk of infection and disease for humans can presently not be estimated.

4. When should a veterinary practitioner suspect an ill cat to be infected with H₅N₁ virus?

Before expressing a suspicion, the potential risk must be evaluated according to the case history and circumstances (see under point 1.);

- if a risk is assumed, a clinical assessment should be carried out and the following signs should be expected: fever, lethargy/depression, dyspnoea, conjunctivitis, rapid death; neurological signs have also been reported;
- The differential diagnosis should exclude other infections leading to similar systemic and respiratory signs, as caused by feline herpesvirus and calicivirus and by bacteria (*Bordetella bronchiseptica*, *Chlamydomphila felis*, also *mycoplasma*);
- clinical signs can only result in a probability diagnosis, which should be confirmed by laboratory testing.

5. How should samples for laboratory diagnosis be handled?

The authorities should be notified according to the national regulations and the diagnostic laboratory is contacted for detailed instructions. However, some general rules apply. To take oropharyngeal, nasal, and rectal swabs or faecal samples, follow the steps below:

- Label plastic sample tubes using an alcohol-proof ink marker;
 - Transfer the samples to the tubes, close tightly;
 - Swab the outside of the tubes with alcohol to reduce the risk of infection for the laboratory staff;
 - Ship the sample tube safely enclosed in plastic bags to the national reference laboratory according to procedures defined by the authorities;
- Post mortem samples of lung and mediastinal lymph nodes should be kept and shipped in 10% formol saline.

It is not recommended to perform an in-house influenza detection test.

6. Which measures should the veterinary practitioner take if a case of H₅N₁-virus infection in a cat is suspected?

For his/her personal protection:

- Minimise all physical contact with the cat, avoid scratching and biting;
- Wear gloves, a mask and protective eyewear when handling the cat;
- sedation of the cat is recommended before taking samples;
- Use a standard medical disinfectant for surface decontamination.

⁶ Maines et al. Avian influenza (H5N1) viruses isolated from humans in Asia in 2004 exhibit increased virulence in mammals. *J. Virol.*, 2005, 79, 11788-11800.

For the protection of practice staff and other animals:

- the suspected cat should be kept in isolation in a cage at the veterinary clinic.

For the protection of the owners and their family:

- at the owner's house, the cat should be confined to a separate room (before bringing it in);
- physical contact with the cat must be minimized, scratching and biting avoided;
- litter trays, bowls, baskets and other potentially contaminated objects should be disinfected using a hypochlorite solution (household bleach);
- rooms to which the cat had access before the visit to the veterinarian should be thoroughly cleaned using a household detergent.

7. What can owners do to minimize the risk of an H₅N₁ avian influenza virus infection?

- Closely follow the development of the epidemic in the national and local media;
- Do not feed uncooked poultry meat to cats;
- If many deaths occur amongst wild birds, cats should be kept indoors until further information about the cause is available.

Relevant web sites

World Health Organisation: <http://www.who.int/en/>

World Organisation for Animal Health: <http://www.oie.int>

European Commission, Animal Health and Welfare:

<http://europa.eu.int/comm/food/animal/>