



AVIAN INFLUENZA IN HUMANS

No. 11, 2006

Type H5N1 avian influenza has been circulating among Asian birds since 1996. Recently, the virus has also been found in birds in several European countries, including Denmark.

In 1997, the first 18 cases of transmission to humans were registered in Hong Kong, where six patients died, EPI NEWS 19/98.

2003 saw two additional cases of human infection in Hong Kong; one patient died. Another Hong Kong patient is presumed to have died from the infection, but the diagnosis was never confirmed.

By January 2004 the first cases of human infection with avian influenza virus A H5N1 were confirmed in Vietnam and Thailand.

In February 2005, the first case of infection was reported from Cambodia; by July Indonesia followed and November 2005 brought the first Chinese cases.

In January 2006, transmission to humans was observed in Turkey and Iraq while recently unconfirmed cases have been reported in Azerbaijan.

The number of confirmed human cases of A H5N1 avian influenza and related human deaths since 2003 are shown in [Table 1](#).

Comments

Human and veterinary preparedness services, including the capacity to diagnose, are geared to respond to avian influenza A H5N1 in Denmark. Furthermore, the Danish National Board of Health has issued guidelines on prophylactic measures in humans in the event of avian influenza, EPI NEWS 10/06. The guidelines detail among others how to destroy avian influenza virus by using soap and alcohol-based hand disinfectants.

The guidelines and other recommendations issued by the authorities are available in Danish at www.fugleinfluenza.com.

The risk of human infection from avian influenza virus in Denmark is considered extremely limited. Sustained human-to-human transmission of avian influenza virus A H5N1 has never been confirmed, and the overwhelming majority of patients have been infected through close contact with infected poultry. There is no evidence of transmission from wild birds to humans.

Known risk factors include the

Table 1. Number of Confirmed Human Cases and Deaths of Avian Influenza A H5N1 since 2003. Source: WHO

Country	2003		2004		2005		2006		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Cambodia	0	0	0	0	4	4	0	0	4	4
China	0	0	0	0	8	5	7	5	15	10
Indonesia	0	0	0	0	17	11	12	11	29	22
Iraq	0	0	0	0	0	0	2	2	2	2
Thailand	0	0	17	12	5	2	0	0	22	14
Turkey	0	0	0	0	0	0	12	4	12	4
Vietnam	3	3	29	20	61	19	0	0	93	42
Total	3	3	46	32	95	41	33	22	177	98

slaughtering of infected poultry and inadequate hygiene when handling infected poultry. Precaution is mandated in these situations as avian influenza transmission to humans has predominantly been observed in conditions typically found in developing countries where infected poultry has been slaughtered for consumption. (S. Glismann, Dep. of Epidemiology)

DIAGNOSIS IN DENMARK

The Danish detection facility for avian influenza in humans is Statens Serum Institut.

Indication

Before performing tests, the microbiologist on call is notified. He or she will assess the test indication in collaboration with the Department of Epidemiology.

In addition to symptoms, case history and up-to-date epidemiological information, any contact to a possible source of infection is essential for assessing the indication.

Sample material

The following material should be submitted:

- A pharyngeal swab made using a white cotton wool swab placed in ½-1 ml isotone saline solution or viral transport medium. Bronchial irrigation solution may also be used
- 10 ml EDTA-stabilised blood and a urine sample
- In some cases conjunctival and rectal swabs may also be required

Tests

Secretion from the respiratory tract is PCR-tested for sequences of the influenza A genome and for the commonly occurring influenza A subtypes (haemagglutinin and

neuraminidase genes). Furthermore, specific reaction tests are performed to detect the H5 and H7 subtypes.

Provided that at least one of the mentioned tests proves positive, full-length sequencing of all influenza A genes is undertaken to characterise the virus in detail. This includes genetic sensitivity determination for neuraminidase inhibitors and M2 ion channel blockers.

It should be stressed that rapid immunochemical tests for influenza A do not have sufficient specificity and sensitivity for the diagnosis of avian influenza.

In addition to the specific tests, a series of tests for other respiratory viruses are performed, including PCR analyses for influenza B, human metapneumovirus, RSV type A and B, adenovirus, parainfluenza virus types 1-3, rhinovirus and the three commonly occurring coronaviruses NL-63, OC43 and 229E.

Finally, the material is tested for bacterial pathogens by conventional microscopy and cultivation and tests performed for Legionella pneumophila, Mycoplasma pneumoniae, Chlamydia psittaci and Chlamydia pneumoniae.

Test results

Results from the viral PCR tests may be produced within a few hours following reception of the sample material.

In urgent cases, sequencing results will be available within 24 hours. Information on the demonstrated influenza viruses and their characterisation will be made available to the international cooperation groups on influenza and reported to the WHO and the EU. (L. P. Nielsen, A. Fomsgaard, Department of Virology)

15 March 2006

Individually notifiable diseases

Number of notifications received in the Department of Epidemiology, SSI (2006 figures are preliminary)

Table 1	Week 10 2006	Cum. 2006 ¹⁾	Cum. 2005 ¹⁾
AIDS	2	9	19
Creutzfeldt-Jakob	1	4	1
Food-borne diseases	9	81	62
of these, infected abroad	1	19	12
Gonorrhoea	12	80	138
Hepatitis A	0	3	27
of these, infected abroad	0	0	7
Hepatitis B (acute)	0	4	12
Hepatitis B (chronic)	39	90	32
Hepatitis C (acute)	0	1	1
Hepatitis C (chronic)	76	118	61
HIV	5	40	74
Legionella pneumonia	1	15	15
of these, infected abroad	0	2	2
Leptospirosis	0	3	5
Measles	4	8	0
Meningococcal disease	0	10	21
of these, group B	0	8	13
of these, group C	0	0	2
of these, unspec. + other	0	2	6
Mumps	0	8	2
Neuroborreliosis	0	13	15
Ornithosis	0	4	4
Pertussis (children < 2 years)	0	15	53
Purulent meningitis			
Haemophilus influenzae	0	1	0
Listeria monocytogenes	0	2	1
Streptococcus pneumoniae	0	13	32
Other aetiology	0	1	0
Unknown aetiology	0	3	3
Under registration	4	23	-
Shigellosis	0	17	23
of these, infected abroad	0	15	21
Syphilis	1	16	17
Tetanus	0	0	2
Tuberculosis	5	77	79
Typhoid/paratyphoid fever	0	7	5
of these, infected abroad	0	7	4
VTEC/HUS	0	20	29
of these, infected abroad	0	7	16

Selected laboratory diagnosed infections

Number of specimens, isolates, and/or notifications received at Statens Serum Institut

Table 2	Week 10 2006	Cum. 2006 ²⁾	Cum. 2005 ²⁾
Bordetella pertussis (all ages)	11	57	172
Gonococci	9	79	91
of these, females	1	15	13
of these, males	8	64	78
Listeria monocytogenes	0	5	6
Mycoplasma pneumoniae			
Resp. specimens ³⁾	13	179	497
Serum specimens ⁴⁾	8	127	341
Streptococci ⁵⁾			
Group A streptococci	8	34	32
Group B streptococci	2	21	9
Group C streptococci	0	6	5
Group G streptococci	2	24	32
S. pneumoniae	26	294	312
Table 3	Week 8 2006	Cum. 2006 ²⁾	Cum. 2005 ²⁾
Pathogenic int. bacteria ⁶⁾			
Campylobacter	32	262	363
S. Enteritidis	8	44	42
S. Typhimurium	6	45	58
Other zoon. salmonella	6	71	66
Yersinia enterocolitica	4	25	36
Verocytotoxin-prod. E.coli	3	15	14
Enteropathogenic E. coli	5	37	38
Enterotoxigenic E. coli	4	28	23

Table 1, notes

In 2006, none of the following cases have been reported: Anthrax, botulism, cholera, diphtheria, haemorrhagic fever, leprosy, plague, polio, rabies, rubella, typhus exanthematicus

1) Cumulative no. 2006 and corresponding period 2005

Tables 2 & 3, notes

2) Cumulative no. 2006 and corresponding period 2005

3) Respiratory specimens with positive PCR

4) Serum specimens with pos. complement fixation test

5) Isolated in blood or spinal fluid

6) See also www.germ.dk

Chronic hepatitis B and chronic hepatitis C

During week 10, the Department of Epidemiology received 32 notifications of chronic hepatitis B and 58 notifications of chronic hepatitis C from one department. The majority of the notifications are from the previous years, and there is no question of an outbreak.

Patients with laboratory confirmed RS and rotavirus

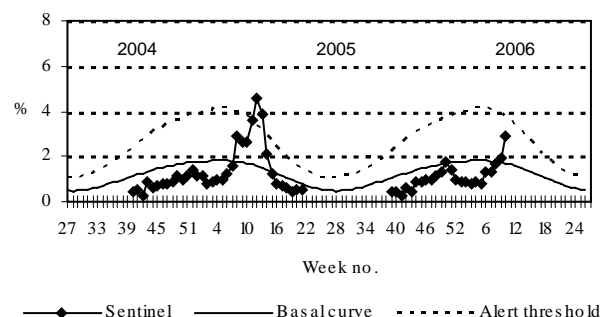
4th quarter 2005 compared with 4th quarter 2004

	RS virus		Rotavirus	
	2005	2004	2005	2004
October	14	10	7	16
November	40	23	8	23
December	96	245	11	41
Total	150	278	26	80

Notifications from the following departments of clinical microbiology: Herning Hospital, Hvidovre Hospital, Slagelse Hospital Viborg Hospital, Aalborg Hospital South, Aarhus Hospital, Department of Virology, SSI

Sentinel surveillance of the influenza activity

Weekly percentage of consultations, 2004/2005/2006



Sentinel: Influenza consultations (as percentage of total consultations)
 Basal curve: Expected frequency of consultations under non-epidemic conditions
 Alert threshold: Possible incipient epidemic