

## *Global Update*

### **News in Brief**

#### **Avian influenza - update**

It is a truth worth noting that all the infectious diseases of human beings in the last 20 years have had animal sources. The interconnectedness of living creatures - human or animal, across continents has never been more dramatic than in the now. Epidemics of disease like fluctuations of the stock market have repercussions worldwide. Hence the need to look closely at the current avian influenza epidemic.

#### **The virus**

Avian influenza is an infectious disease of birds caused by the type A strain of the influenza virus. The strain in the current epidemic is H5N1 (H is the haemagglutinin protein on the virus surface; N is the neuraminidase surface protein).

#### **The disease in birds**

The virus infects all birds. Migratory water birds especially wild ducks are the usual reservoir of this virus and are clinically resistant to development of disease. When ducks and poultry come in close contact there is transmission to poultry with resultant disease.

The disease in birds involves the respiratory system, liver and/or central nervous system. Birds may present with respiratory distress, cyanosis or sudden death without much symptoms.

#### **The mechanism of spread**

Secretions especially faecal matter of birds is the main source of spread of the virus. Migratory birds and trade in live poultry are the 2 main ways this epidemic is spreading across countries.

#### **History**

The first time humans were documented to have been infected by avian influenza was in Hong Kong 1997. Six of the 18 people infected died and a major pandemic was probably prevented by mass culling of Hong Kong's entire poultry population in 3 days. In this episode genetic studies had shown that the virus had leapt directly from poultry to humans without intervening reservoir.

The disease appears to have surfaced this year in a duck farm in Guangxi in China. It then spread to neighboring Vietnam where the first human casualties were reported. Hundreds of miles away in Central China in 2 more districts the disease has been reported in poultry but China denies any human case. Other countries where poultry have been affected include Indonesia, Japan, South Korea, Pakistan, Cambodia, and Laos.

#### **The danger to humans**

This virus is known to infect humans and also cause severe disease in them. Humans in close contact with poultry have been known to be infected with avian influenza. But the real danger of large lethal pandemics is when the virus acquires human influenza viral genes. This results in easy human to human transmission and is the birth of pandemics. This admixture of viral genes also called

'antigenic shift' occurs often in pigs who can be infected by both avian and human influenza viruses whose respiratory epithelium shares sialic acid isoforms with both birds and human beings. Hence pigs are called the mixing bowls of influenza viruses. Recent reports however also suggest that humans in close contact with poultry sometimes behave like mixing bowls when simultaneously infected by avian and human viruses.

### Clinical features in humans

Symptoms in humans are mainly based on the Hong Kong epidemic of 1997. This virus is said to cause severe illness in humans. Patients had fever, coryza, and cough. Severely affected patients developed respiratory distress due to viral pneumonia. Extremes of age and immunocompromised patients are more at risk.

Diagnosis of all influenza strains is possible quickly and accurately from any of the WHO global influenza network laboratories.

### Treatment

Drugs useful in treatment are amantadine, rimantadine, zanamivir and oseltamivir. Drugs have been seen to reduce duration of illness of uncomplicated influenza but have not significantly reduced complications in serious illness.

Duration of therapy recommended is 3-5 days. To stop after 24-48 hours of resolution of symptoms.

Dose All the drugs are approved for children above 1 year of age.

Amantidine/ Rimantidine - Dose for children 1-9 years or <40Kg is 4.4 - 8.8 mg/kg/day (max 150 mg/day). Above 9 years dose is 100 mg BD.

Zanamivir - 5 mg BD by inhalation (approved >7 years of age)

Oseltamivir: dose for children who weigh < 15 kg is 30 mg twice a day; for children weighing >15--23 kg, the dosage is 45 mg twice a day; for those weighing >23--40 kg, the dosage is 60 mg twice a day; and for children weighing >40 kg, the dosage is 75 mg twice a day. The treatment dosage for persons aged > 13 years is 75 mg twice daily.

### Chemoprophylaxis

Amantidine and rimantadine have been used as chemoprophylaxis against influenza A infection. They prevent clinical disease while allowing immunity to develop after subclinical infection. They do not prevent uptake of vaccine if given simultaneously. They must be taken daily for the duration of the influenza epidemic.

### Indications for chemoprophylaxis are:

1. Persons at high risk who are vaccinated after Influenza activity has begun - for eg. Children < 9 years who get the influenza vaccine for the first time need six weeks of prophylaxis - 4 weeks after the first dose and 2 weeks after the 2nd till the immune response develops completely.
2. Persons who provide care to those at high risk such as hospital staff.
3. Persons who have immune deficiencies such as HIV infected individuals.

### Prevention

The quarantining of infected farms and mass culling of infected or exposed poultry are the standard methods to contain these epidemics.

Humans at high risk of exposure should take the current influenza vaccine which will prevent co-infection with human and avian

influenza and prevent antigenic shift. It will take 2-4 months to develop a vaccine for the new strain.

### **Toll so far in humans**

As of 16 February 20 cases (14 fatal) have been reported from Vietnam. As of 20 February, the Ministry of Health in Thailand has reported 7 deaths in 9 confirmed cases. They are further investigating 147 suspicious cases.

### **REFERENCES**

1. Editorial, The Lancet 24 Jan 2004

(www.thelancet.com)

2. [http://www.who.int/csr/disease/avian\\_influenza/en/](http://www.who.int/csr/disease/avian_influenza/en/)
3. Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP) (MMWR 25 Apr 2003;52[RR08]:1-36).

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## **Pedscapes**

Health Protection Agency of UK - <http://www.hpa.org.uk/infections/default.htm>

This website, sponsored by the UK Government, is dedicated to control of infectious diseases. The website contains information on various infectious diseases, emergency response to outbreaks, communicable disease surveillance, bioinformatics, publications including the CDR weekly and the "communicable disease and public health", updates on selected diseases, guidelines and links to other infectious disease resources.

Fact sheets from National foundation for Infectious Diseases(USA) -<http://www.nfid.org/factsheets/>

Information about information infectious diseases is presented in a simple format in this

website. The website also contains a CME section and online publications including the "Clinical updates in Pediatric infectious diseases".

Department of Health expert advisory group on AIDS(UK) - <http://www.doh.gov.uk/eaga/publications.htm>

This website contains latest guidelines on management of HIV including HIV and infant feeding, post-exposure prophylaxis and screening for infectious diseases in pregnancy.

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