rfing for Knowledge

What should we know about the Bird Flu?

This article was rushed for print in this issue to provide general information about avian influenza (bird flu) and information about one type of bird flu, called avian influenza A (H5N1, that has caused infections in birds in Asia and Europe and in humans in Asia. The infection has been recently reported to start spreading in birds in Egypt.

In Egypt, obstetricians/gynecologists are often in the position of the family doctor who is consulted for non-obstetric health issues. This puts a great responsibility on our shoulders to have some answers ready when asked about the bird flu.

Avian influenza is an infection caused by avian (bird) influenza (flu) viruses. These influenza viruses occur naturally among birds. Wild birds worldwide carry the viruses in their intestines, but usually do not get sick from them. However, avian influenza is very contagious among birds and can make some domesticated birds, including chicken, ducks, and turkeys, very sick and kill them.

Infected birds shed influenza virus in their saliva, nasal secretions, and feces. Susceptible birds become infected when they have contact with contaminated secretions or excretions or with surfaces that are contaminated with secretions or excretions from infected birds. Domesticated birds may become infected with avian influenza virus through direct contact with infected waterfowl or other infected poultry, or through contact with surfaces (such as dirt or cages) or materials (such as water or feed) that have been contaminated with the virus.

In birds, the "low pathogenic" form may go undetected and usually causes only mild symptoms (such as ruffled feathers and a drop in egg production). However, the highly pathogenic form spreads more rapidly through flocks of poultry. This form may cause disease that affects multiple internal organs and has a mortality rate that can reach 90-100% often within 48 hours.

There are many different subtypes of type A influenza viruses. These subtypes differ because of changes in certain proteins on the surface of the influenza A virus (hemagglutinin [HA] and neuraminidase [NA] proteins). There are 16 known HA subtypes and 9 known NA subtypes of influenza A viruses. Many different combinations of HA and NA proteins are possible. Each combination represents a different subtype. All known subtypes of influenza A viruses can be found in birds.

Usually, "avian influenza virus" refers to influenza A viruses found chiefly in birds, but infections with these viruses can occur in humans. The risk from avian influenza is generally low to most people, because the viruses do not usually infect humans. However, confirmed cases of human infection from several subtypes of avian influenza infection have been reported since 1997. Most cases of avian influenza infection in humans have resulted from contact with infected poultry (e.g., domesticated chicken, ducks, and turkeys) or surfaces contaminated with secretion/excretions from infected birds. The spread of avian influenza viruses from one ill person to another has been reported very rarely, and transmission has not been observed to continue beyond one person.

During an outbreak of avian influenza among poultry, there is a possible risk to people who have contact with infected birds or surfaces that have been contaminated with secretions or excretions from infected birds.

Symptoms of avian influenza in humans have ranged from typical human influenza-like symptoms (e.g., fever, cough, sore throat, and muscle aches) to eye infections, pneumonia, severe respiratory diseases (such as acute respiratory distress), and other severe and life-threatening complications. The symptoms of avian influenza may depend on which virus caused the infection.

In the current outbreaks in Asia and Europe more than half of those infected with the virus have died. Most cases have occurred in previously healthy children and young adults. However, it is possible that the only cases currently being reported are those in the most severely ill people, and that the full range of illness caused by the H5N1 virus has not yet been defined. For the most current information about avian influenza and

cumulative case numbers, see the World Health Organization (WHO) avian influenza website.

So far, the spread of H5N1 virus from person to person has been limited and has not continued beyond one person. Nonetheless, because all influenza viruses have the ability to change, scientists are concerned that H5N1 virus one day could be able to infect humans and spread easily from one person to another. Because these viruses do not commonly infect humans, there is little or no immune protection against them in the human population. If H5N1 virus were to gain the capacity to spread easily from person to person, an influenza pandemic (worldwide outbreak of disease) could begin.

During August to October 2004, sporadic human cases of avian influenza A (H5N1) were reported in Vietnam and Thailand. Beginning in December 2004, a resurgence of poultry outbreaks and human cases were reported in Vietnam.

On February 2, 2005, the first of four human cases of H5N1 infection from Cambodia were reported. And on July 21, 2005, the first human case of H5N1 in Indonesia was reported. Indonesia continued to report human cases from August 2005 into February 2006. Thailand reported new human cases of H5N1 in October, November, and December 2005, and Vietnam reported new human cases in November 2005. China reported the country's first confirmed human cases in November 2005 and continued to report human cases in December 2005 and into 2006. Turkey reported the country's first confirmed human cases on January 5, 2006 and has continued to report human cases. The first confirmed human infection with avian influenza A (H5N1) in Iraq was reported on February 2, 2006.

On February 8, 2006, Nigeria reported an outbreak of highly pathogenic avian influenza A (H5N1). Tests to determine the similarity of these viruses with those responsible for ongoing H5N1 outbreaks associated with human cases in other regions of the world are underway. On February 11, 2006, Italy reported H5N1 in wild swans. On February 12, 2006 Bulgaria reported H5N1 in a wild swan and Slovenia reported H5 in a wild swan. On February 13, Greece reported H5N1 in wild swans. And on February 14, Iran reported H5N1 in wild swans.

No one can predict when a pandemic might occur. However, experts from around the world are watching the H5N1 situation in Asia and Europe very closely and are preparing for the possibility that the virus may begin to spread more easily and widely from person to person.

Studies done in laboratories suggest that some of the prescription medicines approved in the United States for human influenza viruses should work in treating avian influenza infection in humans. However, influenza viruses can become resistant to these drugs, so these medications may not always work. Additional studies are needed to demonstrate the effectiveness of these medicines.

The H5N1 virus that has caused human illness and death in Asia is resistant to amantadine and rimantadine, two antiviral medications commonly used for influenza. Two other antiviral medications, oseltamavir and zanamavir, would probably work to treat influenza caused by H5N1 virus, but additional studies still need to be done to demonstrate their effectiveness.

There currently is no commercially available vaccine to protect humans against H5N1 virus that is being seen in Asia and Europe. However, vaccine development efforts are taking place. Research studies to test a vaccine to protect humans against H5N1 virus began in April 2005, and a series of clinical trials is under way.

There is little pre-existing natural immunity to H5N1 infection in the human population. If these H5N1 viruses gain the ability for efficient and sustained transmission among humans, an influenza pandemic could result, with potentially high rates of illness and death.

Research suggests that currently circulating strains of H5N1 viruses are becoming more capable of causing disease (pathogenic) in mammals than were earlier H5N1 viruses. One study found that ducks infected with H5N1 virus are now shedding more virus for longer periods without showing symptoms of illness.

The majority of known human H5N1 cases have begun with respiratory symptoms. However, one atypical fatal case of encephalitis in a child in southern Vietnam in 2004 was identified retrospectively as H5N1 influenza through testing of cerebrospinal fluid, fecal matter, and throat and serum samples. Further research is needed to ascertain the implications of such findings.

Transmission of Influenza A Viruses between Animals and People

Avian influenza A viruses may be transmitted from animals to humans in two main ways:

1. Directly from birds or from avian virus-contaminated environments to people. Through an intermediate host, such as a pig. Influenza A viruses have eight separate gene segments. The segmented genome allows

influenza A viruses from different species to mix and create a new influenza A virus if viruses from two different species infect the same person or animal. For example, if a pig were infected with a human influenza A virus and an avian influenza A virus at the same time, the new replicating viruses could mix existing genetic information (reassortment) and produce a new virus that had most of the genes from the human virus, but a hemagglutinin and/or neuraminidase from the avian virus. The resulting new virus might then be able to infect humans and spread from person to person, but it would have surface proteins (hemagglutinin and/or neuraminidase) not previously seen in influenza viruses that infect humans.

This type of major change in the influenza A viruses is known as antigenic shift. Antigenic shift results when a new influenza A subtype to which most people have little or no immune protection infects humans. If this new virus causes illness in people and can be transmitted easily from person to person, an influenza pandemic can occur. It is possible that the process of genetic reassortment could occur in a human who is co-infected with avian influenza A virus and a human strain of influenza A virus. The genetic information in these viruses could reassort to create a new virus with a hemagglutinin from the avian virus and other genes from the human virus. Theoretically, influenza A viruses with a hemagglutinin against which humans have little or no immunity that have reassorted with a human influenza virus are more likely to result in sustained human-to-human transmission and pandemic influenza. Therefore, careful evaluation of influenza viruses recovered from humans who are infected with avian influenza is very important to identify reassortment if it occurs.

2. Although it is unusual for people to get influenza virus infections directly from animals, sporadic human infections and outbreaks caused by certain avian influenza A viruses and pig influenza viruses have been reported. These sporadic human infections and outbreaks, however, rarely result in sustained transmission among humans.

Recommended laboratory tests to identify avian influenza A virus in specimens from humans

Laboratory identification of human influenza A virus infections is commonly carried out by direct antigen detection, isolation in cell culture, or detection of influenza-specific RNA by reverse transcriptase–polymerase chain reaction.

The optimal specimen for influenza A virus detection is a nasopharyngeal aspirate obtained within 3 days of the onset of symptoms, although nasopharyngeal swabs and other specimens can also be used All manipulation of specimens and diagnostic testing should be carried out following standard biosafety guidelines.

The strategy for initial laboratory testing of each specimen should be to diagnose influenza A virus infection rapidly and exclude other common viral respiratory infections. Results should ideally be available within 24 hours.

Procedures for influenza diagnosis

Assays available for the diagnosis of influenza A virus infections include:

1. *Rapid antigen detection.* Results can be obtained in 15–30 minutes.

   • *Immunofluorescence assay*. A widely used, sensitive method for diagnosis of influenza A and B virus infections and five other clinically important respiratory viruses

   • *Enzyme immunoassay*. For influenza A nucleoprotein (NP).

2. *Virus culture***.** Provides results in 2–10 days. Both shell-vial and standard cell-culture methods may be used to detect clinically important respiratory viruses. Positive influenza cultures may or may not exhibit cytopathic effects but virus identification by immunofluorescence of cell cultures or haemagglutination-inhibition (HI) assay of cell culture medium (supernatant) is required.

3. *Polymerase chain reaction and Real-time PCR assays.*

   Any case testing positive by rapid testing for avian influenza virus should be confirmed by PCRtechnique and reported to the national health office and the regional WHO office.

   Primer sets specific for the haemagglutinin (HA) gene of currently circulating influenza A/H1, A/H3 and B viruses are becoming more widely used. Results can be available within a few hours from either clinical swabs or infected cell cultures. Additionally several WHO Collaborating Centres are developing PCR and RT-PCR reagents for non-typical avian/human influenza strains.

Any specimen with a positive result using the above approaches for influenza A virus and suspected of avian influenza infection should be further tested and verified by a designated WHO H5 Reference Laboratory. Laboratories that lack the capacity to perform specific influenza A subtype identification procedures are requested to:

1. *Forward specimens or virus isolates to a National Influenza Centre or to a WHO H5 Reference Laboratory for further identification or characterization.*
2. *Inform the WHO Office in the country or WHO Regional Office or WHO HQ Global Influenza Programme that specimens or virus isolates are being forwarded to other laboratories for further identification or further characterization.*

Recommendations for Avian Influenza

Interim Recommendations for Infection Control in Health-Care Facilities Caring for Patients with Known or Suspected Avian Influenza Each human infection represents an important opportunity for avian influenza to further adapt to humans and gain the ability to transmit more easily among people.

Although rare, human-to-human transmission of avian influenza may be associated with the possible emergence of a pandemic strain.

All patients who present to a health-care setting with fever and respiratory symptoms should be managed according to recommendations for Respiratory Hygiene and Cough Etiquette and questioned regarding their recent travel history.

Patients with a history of travel within 10 days to a country with avian influenza activity and are hospitalized with a severe febrile respiratory illness, or are otherwise under evaluation for avian influenza, should be managed using isolation precautions identical to those recommended for patients with known Severe Acute Respiratory Syndrome (SARS). These include:

Standard Precautions

- Pay careful attention to hand hygiene before and after all patient contact or contact with items potentially contaminated with respiratory secretions.

Contact Precautions

- Use gloves and gown for all patient contact.
- Use dedicated equipment such as stethoscopes, disposable blood pressure cuffs, disposable thermometers, etc.
- Eye protection (i.e., goggles or face shields) should be worn when within 3 feet of the patient.

Airborne Precautions

- Place the patient in an airborne isolation room (AIR). Such rooms should have monitored negative air pressure in relation to corridor, with 6 to 12 air changes per hour (ACH), and exhaust air directly outside or have recirculated air filtered by a high efficiency particulate air (HEPA) filter. If an AIR is unavailable, contact the health-care facility engineer to assist or use portable HEPA filters to augment the number of ACH.
- Use a fit-tested respirator, filtering facepiece (i.e., disposable) respirator, when entering the room.
- These precautions should be continued for 14 days after onset of symptoms or until either an alternative diagnosis is established or diagnostic test results indicate that the patient is not infected with influenza A virus. Patients managed as outpatients or hospitalized patients discharged before 14 days with suspected avian influenza should be isolated in the home setting

How do people become infected with avian influenza viruses?

Most cases of avian influenza infection in humans have resulted from direct or close contact with infected poultry (e.g., domesticated chicken, ducks, and turkeys) or surfaces contaminated with secretions and excretions from infected birds. The spread of avian influenza viruses from an ill person to another person has been reported very rarely, and transmission has not been observed to continue beyond one person. During an outbreak of avian influenza among poultry, there is a possible risk to people who have direct or close contact with infected birds or with surfaces that have been contaminated with secretions and excretions from infected birds.

Does the current seasonal influenza vaccine protect me from avian influenza?

No. Influenza vaccine for the 2005-06 season does not provide protection against avian influenza.

Vaccination of Health-Care Workers against Human Influenza health-care workers involved in the care of patients with documented or suspected avian influenza should be vaccinated with the most recent seasonal human influenza vaccine. In addition to providing protection against the predominant circulating influenza strain, this measure is intended to reduce the likelihood of a health-care worker's being co-infected with human and avian strains, where genetic rearrangement could take place, leading to the emergence of potential pandemic strain.

Is there a risk for becoming infected with avian influenza by eating poultry?

There is no evidence that properly cooked poultry or eggs can be a source of infection for avian influenza viruses

What precautions can be taken to reduce the risk for infection from wild birds?

Avoid touching wildlife. If there is contact with wildlife do not rub eyes, eat, drink, or smoke before washing hands with soap and water.

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How does H5N1 virus differ from seasonal influenza viruses that infect humans?

Of the few avian influenza viruses that have crossed the species barrier to infect humans, H5N1 virus has caused the largest number of reported cases of severe disease and death in humans. In the current situation in Asia, more than half of the people infected with the virus have died. Most cases have occurred in previously healthy children and young adults. However, it is possible that the only cases currently being reported are those in the most severely ill people and that the full range of illness caused by the H5N1 virus has not yet been defined.

Unlike seasonal influenza, in which infection usually causes only mild respiratory symptoms in most people, H5N1 infection may follow an unusually aggressive clinical course, with rapid deterioration and high fatality. Primary viral pneumonia and multi-organ failure have been common among people who have become ill with H5N1 influenza.

Is there a risk in handling feather products that come from countries experiencing outbreaks of avian influenza A (H5N1)?

There is a risk to handling feather products from countries experiencing outbreaks of H5N1 influenza

Sources:.

1. *www.avian-bird-flu-news.co.uk*
2. *www.cdc.gov/flu/avian/*
3. *www.who.int/entity/csr/disease/avian_influenza/en/*