Avian/Swine Influenza

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Avian Influenza

- Avian influenza (AI), commonly called bird flu, is an infectious viral disease of birds.
- Most avian influenza viruses do not infect humans; however some, such as A(H5N1) and A(H7N9), have caused serious infections in people.
- The majority of human cases of A(H5N1) and A(H7N9) infection have been associated with direct or indirect contact with infected live or dead poultry.
- Controlling the disease in animals is the first step in decreasing risks to humans.

Avian Influenza

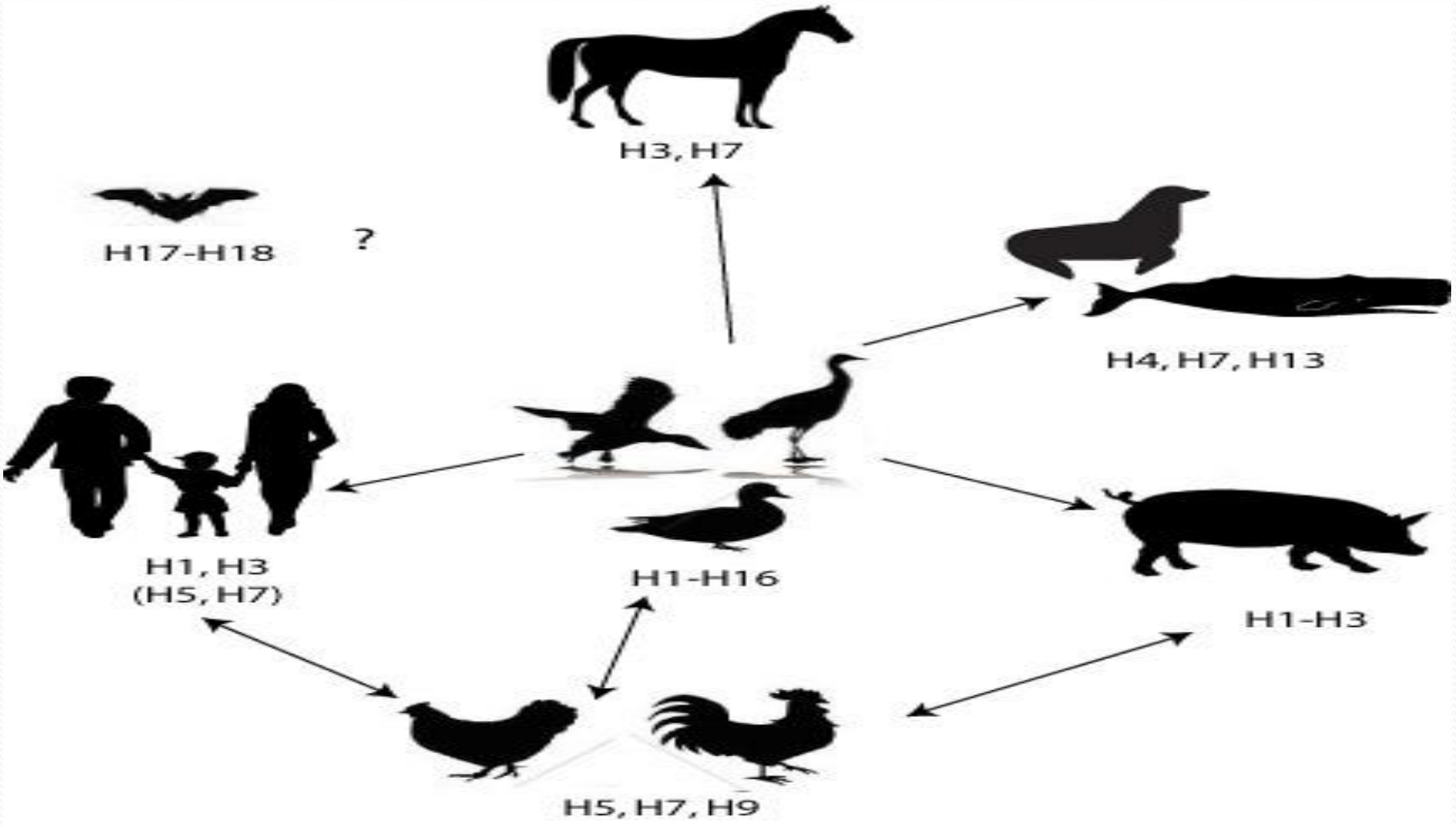
- Avian influenza (AI) is an infectious viral disease of birds (orthomyxovirus)(especially wild water fowl such as ducks and geese), often causing no apparent signs of illness.
- AI viruses can sometimes spread to domestic poultry and cause large-scale outbreaks of serious disease.

Some of these AI viruses have also been reported to cross the species barrier and cause disease or subclinical infections in humans and other mammals.

Avian Influenza

- AI viruses are divided into 2 groups based on their ability to cause disease in poultry: high pathogenicity or low pathogenicity.
- ** Highly pathogenic viruses result in high death rates (up to 100% mortality within 48 hours) in some poultry species.
- **Low pathogenicity viruses also cause outbreaks in poultry but are not generally associated with severe disease.

Avian Influenza



Clinical Findings and Lesions

Clinical signs, severity of disease, and mortality rates vary depending on AI virus strain and host species.

- **Low Pathogenicity Avian Influenza Viruses:**
- LP AI viruses typically produce respiratory signs such as sneezing , coughing ,and nasal discharge , and swollen in poultry.
- Sinusitis (إلتهاب الجيوب)is common in domestic ducks, quail, and turkeys.
- Lesions in the respiratory tract typically include congestion and inflammation of the trachea and lungs.
- In layers and breeders, there may be decreased egg production or fertility.
- The morbidity and mortality is usually low unless accompanied by secondary bacterial or viral infections

High Pathogenicity Avian Influenza Viruses:

Even in the absence of secondary pathogens,

HP AI viruses cause severe, systemic disease with high mortality in chickens, turkeys, and other gallinaceous poultry; mortality can be as high as 100% in a few days.

In acute cases, lesions may include cyanosis and edema of the head, comb, wattle, and snood (turkey).

In severely affected birds, greenish diarrhea is common.

Diagnosis:

- LP and HP AI viruses can be readily isolated from oropharyngeal and cloacal swabs, and HP AI viruses from many internal organs .
- ****Prevention and Treatment:**
- Vaccines can prevent clinical signs and death.
- Viral replication and shedding from the respiratory and GI tracts may be reduced in vaccinated birds.
- We can use antiviral drugs for human and animals.

Bird flu and danger to humans

Bird flu, or avian flu, has a high mortality rate in humans, but as of yet, can ~~not~~ be transmitted from person to person.

. . . WHO, Feburary 20th, 2006: "Human infections remain a rare event."

Infection with type A virus H5N1

1 Most virulent bird flu virus; mutates rapidly, altering its genetic material

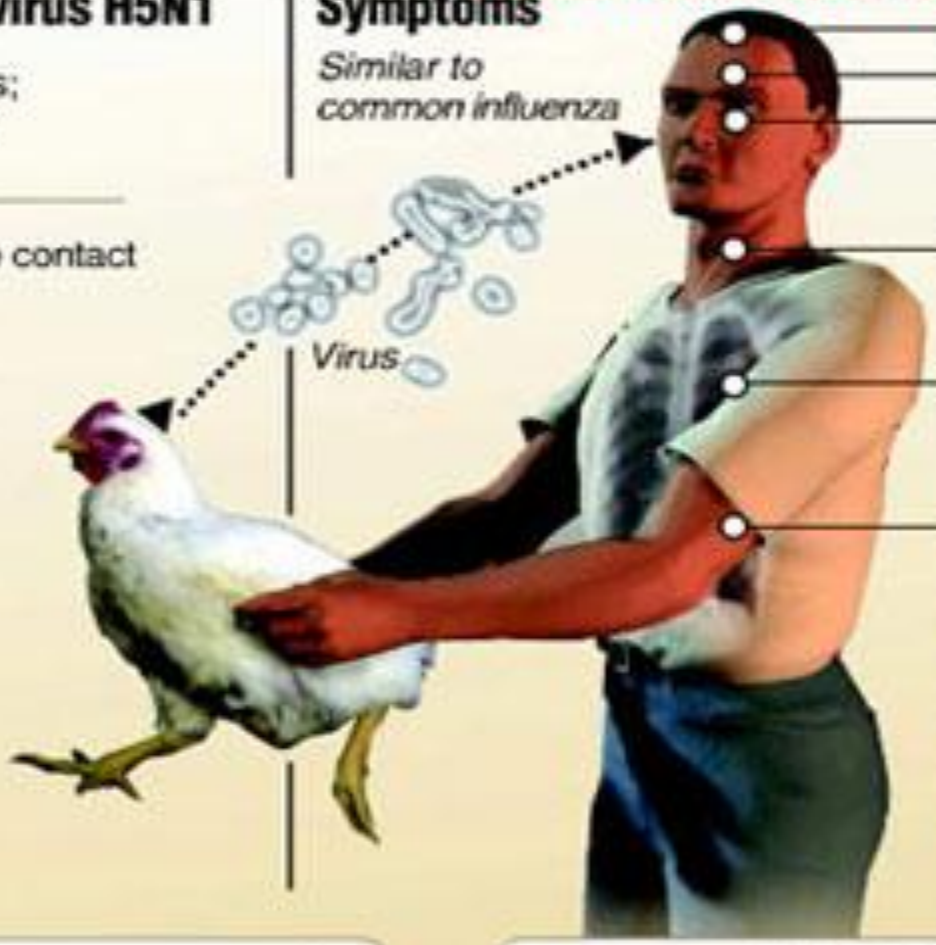
2 Humans infected by close contact with live infected poultry

3 Birds carry virus and excrete it in feces, which dries, becomes pulverized and then can be inhaled or taken in by touch

4 Humans have no immunity against this virus

Symptoms

Similar to common influenza



When untreated

Rapid deterioration; viral pneumonia leading to respiratory distress, kidney failure, multi-organ failure, death

Reason for concern

Humans infected with bird flu could serve as a host for a new genetic subtype that can be transmitted from person to person

Might start influenza pandemic

Source: World Health Organization Graphic: Jutta Scheibe, Morten Lyhne

2016 Seasonal Influenza Vaccines

- **What are the seasonal strains for 2016?**
- **This year's seasonal influenza vaccine will offer protection against the following strains:**
- 1•A/California/7/2009 (H1N1)-like virus
- 2•A/Hong Kong/4801/2014 (H3N2)-like virus
- 3•B/Brisbane/60/2008-like virus
- **How are INFLUVAC produced?**
- INFLUVAC is a subunit vaccine which contains only viral surface antigens (or protein haemagglutinins). The virus is concentrated, inactivated by disrupting its membranes.
- Influenza virus is grown in embryonated hens' eggs from disease-free flocks. The haemagglutinin protein for each of the strains are harvested for use in influenza vaccine.

Swine Influenza

- Swine influenza is a respiratory disease of pigs caused by type A influenza viruses that regularly cause outbreaks of influenza in pigs.
- Influenza viruses that commonly circulate in swine are called "swine influenza viruses" or "swine flu viruses."
- Like human influenza viruses, there are different subtypes and strains of swine influenza viruses.
- The main swine influenza viruses circulating in U.S. pigs in recent years have been, swine triple reassortant (tr) H1N1 influenza virus, trH3N2 virus, and trH1N2 virus.

Pathogenesis

- The spectrum of infection ranges from subclinical to acute.
- In the classic acute form, the virus multiplies in bronchial epithelium within 16 hr of infection and causes focal necrosis of the bronchial epithelium, focal atelectasis, and gross hyperemia of the lungs. .
- The lesions continue to develop until 72 hr after infection, after which the virus becomes more difficult to demonstrate.

Clinical Findings

- A classic acute outbreak is characterized by sudden onset and rapid spread through the entire herd, often within 1–3 days.

- The main signs are depression, fever (to 108°F [42°C]), anorexia, coughing, dyspnea, weakness, prostration, and a mucous discharge from the eyes and nose.

Diagnosis

- A presumptive diagnosis can be made on clinical and pathologic findings, but confirmation depends on detection of viral RNA via PCR, molecular sequencing, or demonstration of virus-specific antibody.
- Virus can be isolated from nasal secretions in the febrile phase or from affected lung tissue in the early acute stage.

Transmission and Epidemiology

- In North America, outbreaks are most common in fall or winter, often at the onset of particularly cold weather.
- In warmer areas of the world, infection may occur at any time.
- Usually, an outbreak is preceded by one or two individual cases and then spreads rapidly within a herd, mainly by aerosolization (غبار او تربة)and pig-to-pig contact.
- The virus survives in carrier pigs for up to 3 month and can be recovered from clinically healthy animals between outbreaks. In antibody-positive herds, outbreaks of infection recur as immunity wanes.

Treatment and Control

- There is no effective treatment, although antimicrobials may reduce secondary bacterial infections.
- Vaccination and strict import controls are the only specific preventive measures.
- Good management practices and freedom from stress, particularly due to crowding and dust, help reduce losses.
- Commercially available killed vaccines that contain both H1N2 and H3N2 subtypes appear to induce a strong protective immune response.