

AVIAN INFLUENZA

Assoc. Prof. İnci Başak Müştak

Ankara University Faculty of Veterinary Medicine

Department of Microbiology

- Avian Influenza (AI) is an international problem.
- On the list of OIE
 - HPAI (H5/H7)
 - H5/H7 LPAI
- It is on the list of compensated and notifiable animal diseases in Turkey

- Between 1959 and 1999: only 18 cases were reported. About 23 million poultry are affected in these period
- Between 1999 and 2006: cases caused by H5N1 were seen and more than 300 million poultry were affected in these cases
- 2006- widespread, significant economic losses in different countries, also human cases

Etiology

- *Orthomyxoviridae*, **Influenza A virus**
- Influenza viruses are divided into four groups A,B,C and D. **Group A** includes the agents which are responsible for the diseases in poultry
- **AI viruses**
 - low pathogenic viruses (LPAI)
 - mid-pathogenic viruses (the MPAA)
 - high pathogenic viruses (HPAI)
- **Typing of AI viruses**
 - Hemagglutinin antigen (HA: 1-15)
 - Neuraminidase antigen (NA; 1-9)

Avian Influenza (AI) Viruses

- The genetic material of the virus is RNA
- Consists of 8 independent segments
- High levels of mutations and changes

16 type H antigens= hemagglutinin

(H1-H16)

9 type N antigens= neuraminidase

(N1-N9)

- AI viruses are named HxNy

(For ex. H7N2, H5N1)

Pathogenicity

There are 2 patotypes of Influenza A in poultry

Highly Pathogenic, HPAI

- Cause serious infection
- Mortality can reach 100%
- H5 or H7 subtypes
- However, not all H7 or H5 subtypes are HPAI

Low pathogenic, LPAI

- Mild respiratory infection
- Decrease in egg production
- Weakness
- Cause more severe disease with other infections and poor management

Important AI Outbreaks

- H5 and H7 subtypes have been effective in severe outbreaks seen to date
 - Pennsylvania-Virginia-New Jersey (1983-84) **H5N2**
 - Italy (1999-2002) **H7N1**
 - Holland-Belgium (2002-) **H7N7**
 - **In Asia (2003-) H5N1, H5N2, H5N3, H5N8, H7N2, H7N3, H7N7, H7N9**

Host distribution

- Poultry, human, horse, pig, seal, whale, mink

Among poultry;

- turkey, chicken, duck-geese, quail, ostrich
- pheasant, quail, seagull, partridge, sea birds, marsh birds
- budgerigar, peacock, parrot

Spread of the virus and Sand Birds

Migratory sea birds are defined as virus reserves

Infection

- Fecal-oral tract
- From the respiratory system
- Mechanical transmission
(people, vehicles, equipment
insects, rodents)
- Transmission by aerosol is
limited

Avian Influenza in the World

Avian Influenza cases in poultry: 2005-2021

Avian Influenza in Turkey

Avian Influenza Cases in Poultry in Turkey

Clinical Signs

- The incubation period can range from a few hours to 3 days sometimes can take 14 days
- Morbitide high
- Mortality can range from negligible to 100%
- Clinical findings are highly variable:
 - from subclinic to mild respiratory tract infections and
 - acute generalized form
- In some cases, the infection can occur without any clinical symptoms and death can be seen
- Severe depression, decrease the activity of the animals, decreased feed intake

Clinical Signs

- Gathering, hair disorder, edema on head and face, cyanosis of hairless skin
- Cough, sneezing, runny nose, breath sounds, excessive lacrimation
- Nervous symptoms
- Decreased egg production
- Diarrhea

Macroscopic findings

- In sinus: catarrhal, fibrinous, serofibrinous, mucopurulent, or caseous inflammation is observed
- Exudates ranging from serous to caseous in trachea
- Thickening, fibrinous and caseous exudate in air sacs
- Perytonitis
- Catarrhal/fibrinous enteritis especially in the caecum and/or intestines of turkeys
- Exudate in oviduct in layer flocks

Commonly seen lesions

- Sinuses swollen and edematous
- Feathers and combs zionitic, hemorrhagic
- Congestion and hemorrhage may also occur in the legs
- As the disease progresses, necrotic foci are frequently seen in the internal organs (liver, spleen, kidney and lung)

Laboratory Diagnosis

- Isolation and identification
- Typing
- Pathogenicity tests
- Serology
- Molecular methods

Discriminatory Analysis

In cases of infection with sudden death

- ND
- ILT
- Acute poisonings

Lesions on comb and feathers

- Acute Chicken Cholera
- Septicemic diseases