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Bird Flu Resurgence: A Stark Warning for Future Pandemics

Dr. Prachi Chandrakar[1] and Dr. Sahil Thakur[2]
1Ph.D. Scholar, Division of Livestock Production Management, ICAR- National Dairy Research Institute, Karnal, Haryana
2M.V.Sc., Department of Animal Nutrition, College of Veterinary Science and A.H., NDVSU, Jabalpur, M.P.
*Corresponding Author: prachichandrakar82@gmail.com
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Abstract:

Commercial poultry farms are expanding rapidly with the integration of modern technology and advanced management practices. However, the lack of proper care, inadequate knowledge, neglect of vaccination, and indiscriminate use of antibiotics are contributing to the resurgence of several deadly diseases, including Avian influenza. Avian influenza, in particular, poses a significant zoonotic threat. Therefore, it is crucial to implement enhanced preventive measures to control and mitigate its spread.

Keywords: Avian Influenza, Faeces, Migratory Birds, Pandemic, Poultry Farms

Introduction:

One of the major challenges facing the poultry industry, significantly impacting bird performance, is the resurgence of avian diseases like Avian influenza. Avian influenza viruses belong to the Orthomyxoviridae family, genus 'A', and share certain antigens with influenza viruses found in humans, horses, and pigs. There are approximately 80 serotypes of influenza viruses that infect birds. The disease affects a wide range of avian species, including poultry, ducks, geese, guinea fowl, quails, turkeys, and pheasants, with domestic fowl and turkeys being the most commonly affected. Many wild bird species, especially waterfowl and seabirds, are also vulnerable, though infections in these birds are usually subclinical. Psittacine birds are particularly susceptible and may contribute to spreading the disease (Petersen *et al*., 2024). Birds that recover can shed the virus for 1-3 months through all bodily secretions and excretions. Transmission occurs via air and water, and mortality in outbreaks can reach 90-100% (Wong *et al*., 2007).

The etiological agents of Avian influenza are the influenza A virus subtypes H5 and H7, which are highly pathogenic. This disease is highly contagious, and most highly pathogenic avian influenza (HPAI) strains have been isolated from chickens and turkeys. There is evidence that H5 viruses of low pathogenicity can mutate into highly pathogenic forms. It's important to note that HPAI infections are rare and should not be confused with low

pathogenic viruses, which may also belong to the H5 or H7 subtypes. Occasionally, highly pathogenic H5 and H7 viruses have been isolated from free-living birds in Europe and other regions (Shi *et al*., 2014).

The virus is shed through faeces and respiratory secretions, and highly pathogenic strains can remain viable for extended periods in infected faeces, tissues, and water. The incubation period is typically 3-5 days.

Brief Scenario on Outbreak in India:

- As of 2015, according to records from the Department of Animal Husbandry and Dairying (DAHD), Government of India, the country has experienced 28 outbreaks of the disease across various States and Union Territories.
- During the control and containment measures, approximately 7.246 million birds were culled.
- Additionally, around ₹24.32 crore was paid as compensation to the affected farmers.

Transmission:

- Direct contact with secretions or faeces from infected birds.
- The virus can spread through the air and be inhaled, transmitting from bird to bird.
- Infected wild bird droppings can contaminate both commercial and backyard poultry.
- Contaminated water, feed, equipment, vehicles, cages, clothing, and shoes can all spread the virus.
- Rodents, through their feet and bodies, act as mechanical vectors for the virus.
- Contaminated broken eggs can also transmit the disease.
- Just 1 gram of contaminated manure can infect up to 1 million birds.

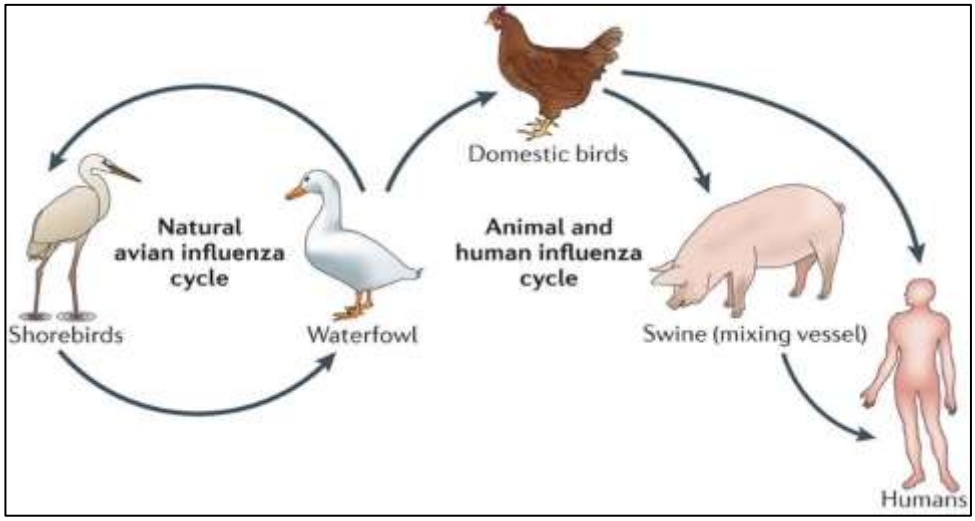

Fig. - Cycle of Avian influenza viruses in animals & humans (Shi *et al*. 2014)

Symptoms In Infected Birds:

- ✓ Severe depression and loss of appetite
- ✓ Sharp decline in egg production
- ✓ Facial swelling, with cyanotic (bluish) combs and wattles
- ✓ Petechial haemorrhages on internal membrane surfaces
- ✓ Sudden death, with mortality rates reaching 100%
- ✓ Neurological symptoms

- ✓ Lack of energy and appetite
- ✓ Swelling of the head, eyelids, comb, wattles, and legs
- ✓ Purple discoloration of the comb and wattles
- ✓ Nasal discharge
- ✓ Coughing and sneezing
- ✓ Diarrhoea ranging from greenish to white

Symptoms In Human:

- ✓ Fever, sneezing, coughing, and a sore throat
- ✓ Muscle aches and eye infections
- ✓ Conjunctivitis and gastrointestinal symptoms
- ✓ Pneumonia and severe respiratory distress
- ✓ Encephalitis and encephalopathy

Present Status:

- India's first case of bird flu was reported at AIIMS, Delhi.
- An 11-year-old boy from Haryana was admitted to AIIMS, Delhi with a high fever and cough. Initially suspected to have COVID-19, he tested negative. Further investigation revealed that the boy was infected with a strain of avian influenza. There is no vaccine for humans against any bird flu strains (TOI – July 21, 2021).
- The World Health Organization (WHO) confirmed a human case of bird flu in India caused by the H9N2 virus. The infection was identified in a four-year-old child in West Bengal (NDTV World – June 12, 2024).

Solutions To Tackle Bird-Flu:

Since there is no definitive treatment, our only option remains the approach of "prevention is better than cure."

Pre-Outbreak Preparedness:

- Surveillance must remain in a constant state of alert and readiness.
- Monitoring should cover both poultry and migratory birds (Sidik, 2023).
- Poultry owners are responsible for reporting any unusual sickness or mortality.
- Routine surveillance is essential.
- The population density of poultry birds in each tahsil, both in backyard and commercial setups, should be tracked.
- Flyways of migratory birds, such as those near national parks, water bodies, and sanctuaries, should be monitored.
- All veterinary officers in the district (Government, Semi-Government, and Private) must immediately report to the District Animal Husbandry Officer (DAHO) if mortality exceeds the average.

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- Similarly, forest officials should report unusual deaths to senior forest officers and the Animal Husbandry Department.

DAHO should visit site immediately on receipt of preliminary information:

- The District Animal Husbandry Officer (DAHO), accompanied by the Livestock Development Officer (LDO) or Veterinary Officer (VO) equipped with a kit, should visit the site within 2 hours.
- They should conduct preliminary and clinical investigations and collect samples for laboratory analysis.
- Protective gear and equipment must be worn, and information should be gathered, including the identification of the specific farm unit and its topography.
- The number of birds and other animals on the farm, as well as the staff and vehicles directly associated with the unit, should be documented.
- Recent movements of people, vehicles, and animals/birds must be noted. The availability of disinfectants and equipment for disinfecting the premises on-site should also be assessed (Abbasi, 2024).

Identification of Alert zone:

- An alert zone with a radius of 10 km from the affected area should be established.
- All villages and settlements within this zone must be identified.
- Local panchayat authorities and veterinary staff in these areas should be informed about the potential risk of avian flu and requested to strictly enforce the 10 km restriction.
- No vehicles should be permitted to enter or exit the affected farm premises.
- Movement of poultry, eggs, dead carcasses, manure, used litter, farm machinery, or any related materials should be prohibited within and outside the alert zone.
- Disinfection procedures must be strictly implemented at the entrances of the premises.
- Farm personnel are required to wear protective clothing, face masks, gloves, and gumboots (Dye and Barclay, 2024).

Vaccination:

Inactivated Vaccine:

- Monovalent including either H5 or H7 Strains
- Bivalent including H5 and H7 Strains

Live recombinant vaccines (Fowl-pox H5):

- These vaccines are effective only for chicken species and specifically for day-old chicks.
- The currently available vaccines and their applications are detailed in the "FAO recommendations on the prevention, control, and eradication of avian influenza."

- Aflunov is currently the only vaccine approved for human use against avian influenza (a zoonotic pre-pandemic vaccine).

Conclusion:

A robust monitoring program, particularly between September and February, can help decrease the incidence of disease in India. Vaccination can lower infection levels, thereby reducing the risk of transmission to humans and other poultry, while also minimizing the socio-economic costs associated with control measures. Additionally, these strategies can help curb the spread of bird flu.

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