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Current Update on Avian Influenza: A Review

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Abstract

Flu viruses A have an extensive range of host diseases, beginning with wild aquatic oats, poultry and human. Cross-species transmission of avian influenza A, particularly subtype H5N1, has recently emphasized the importance and occurrence of non-human subtypes in the population over the last ten years. The diseases can go forward asymptomatic to pneumonia and death during cross-species transmission. However, in these situations, the possibility of genetic alteration, the emergence of a new virus and the need for public health measures and hospital measures are increased. This study explores the epidemiology, selection of hosts, human diseases, outcome of avian influenza A cross-transmission into human

Key words: Avian Influenza, Causes, Treatment

Introduction

In the last 100 years, H1 H2 and H3 subtypes of influenza A viruses triggered human influenza pandemics. More recently, subtypes of avian flu (i.e., H5 and H7) have founded to infect people directly from their avian hosts. The recent emergence, expansion and spread in Asia of the H5N1 subtype of highly pathogenic avian influenza HPAI have raised global concerns about both HPAI H5N1 mortality and potential for a new pandemic. This paper discusses emerging human diseases and their health and medical consequences with avian influenza. In the layer poultry farm in Thies, Senegal, 100,000 chicken, including 58,000 sick chickens who die of the disease and 42,000 other chickens killed for an outbreak, were founded due to a highly pathogenic avian influenza that threatens public health. WHO for Animal Health was formally informed on 7 January 2021, and this change was refused by the Gambia Veterinary Services to hear about this highly pathogenic avian influenza.

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The EDC, NDMA and DPWM National taskforce, headed by DLS, therefore calls to carry out the activities necessary to address the risk posed by HPAI virus in Senegal, including efforts to ensure its absence in the Gambia," he concluded (2015-2019) by calling for the Integrated national Emergency Prepare and Response Program for Aviation and Human Fluid. 'HPAI's known as bird flu is an extremely contact, highly zoonotic infectious disease with a broad global public health risk or COVID-19-like, or worse, possible pandemic. The controls for the HPAI focus on domesticated poultry such as chicken.

Types of influenza

The influenza A, B, and C of both human pandemic and seasonal diseases are the most prominent Orthomyxoviridae family's genera. Influenza viruses are single-stranded, segmented RNA. The subtypes were categorized with the antigenic property of glycoproteins expressing on the surface on the virus, which include hemagglutinin (HA) and neuraminidase (NA). Flu A is distinguished by their pathogenic characteristics, which cause serious diseases or death in domestic poultry with highly pathogenic avian influenza (HPAI). Molecular modifications in RNA genomes are created by two mechanisms: point mutation (antigenic drift) and RNA (antigenic shifting) segment reassortment. Point mutations are the primary reason why a vaccine for influenza A is given annually, which cause slight changes to the antigenic nature of viruses. Re-sampling occurs whenever two or more influenza A viruses infect a host cell, leading to the development of a new kind of influenza A. Reassortment of influenza sub-types from the pandemics of 1957 (H2N2) and 1968 (H3N2), though the cause of the influenza pandemic of 1918 (H1N1) is uncertain.advise everyone to be calm yet alert and only DLS staff to report any unusual animal health events in poultry. The ultimate goal of this message is to protect human life and enhance food safety as a clear sign of the Gambia government's commitment to protect its citizens and livelihoods. The HA glycoprotein mediates the virus's fixation and input by binding to sialic acid receptors' cell surface. The HA's links to the host sialic acid enable influenza A to be host specific. Sous-types of avian influenza prefers binding to galactose-related sialic acid by combining α-2,3 in the bowel and respiratory . The α-2.6 linkages in human respiratory epithelia are related to the human virus. Swine contain an α-2,3 and an α-2,6 association in their respiratory epithelium, making it possible to co-infect easily with subtypes of both human and avian vessels (and function as a 'mixer' for new strains). The α-2,3 and α-2,6 linkages in human lower respiratory tracts and conjunctive were founded to allow for human avian infections. The main goal for immunity by neutralization of antibodies is HA glycoprotein.

Highly Pathogenic and Low Pathogenic Avian Influenza A Viruses

Avian influenza A viruses are categorized according to the virus's molecular characteristics, the severity of the illness caused by it, and death rates. They can classify as highly pathogenic or low pathogenic avian influenza (HPAI). LPAI, as well as HPAI, have resulted in significant human disease. LPAI contaminated poultry is practically unillustrated but can present mild diseases such as ruffled feathers and a decline in egg production normally not detected. HPAI poultry infected exhibit serious illnesses, and the mortality rate is also very high among infected persons. These two HPAI and LPAI {FIG:1}viruses spread very quickly among poultry. HPAI is an extremely serious infection which causes damage to the internal organs, leading to 90-100 per cent death in chickens within 48 hours. Numerous genetic and antigenic variations affect both animals and birds between influenza {FIG:2} A virus subtypes. Human beings are occasionally affected by avian influenza, but it causes significant harm upon being infected. The most popular subtypes of influenza viruses that affect people are H5, H7 and H9. Other viruses such as H10N8, H10N7, and H6N8 were found but less common in humans.

Flu A H5

H5 external viruses have nine subtypes, H5N2, H5N3, H5N4, H5N5, H5N6, H5N7, H5N8 and

H5N9, and LPAI is primarily H5 virus. H5 external icon viruses have nine different types. The sporadic H5 virus, like Asian lineage HPAI H5N1, has infected humans.

Flu A H7

As subtypes of LPAI viruses, H7 external viruses include H7N1, H7N2, H7N3, H7N4, H7N5, H7N6, H7N7, H7N8, and H7N9. This virus is very rare in humans. Asian lineage avian influenza A(H7N9) viruses are the most common H7 virus infected by humans, the first to be detected in China in 2013. While human infections are rare, they have few negative effects, including serious respiratory failure and death. Asian H7N9 viruses, H7N2, H7N3, H7N7 viruses, which lead to mild to moderate illnesses of humans, with symptoms such as conjunctivitis and upper respiratory tract symptoms, are also known.

Flu A H9

The sub-types of H9 external virus icon known worldwide as LPAI viruses are H9N1, H9N2, H9N3, H9N4, H9N5, H9N6, H9N7, H9N8 and H9N9. The infection with the H9N2 virus has contributed to mild, upper respiratory disease in humans.

Confirmed case reports

In 12 states for crow/migratory/wild birds, avian flu has confirmed. Avian influenza outbreaks (Bird Grip) were reported for poultry birds in nine states (Kerala, Haryana, Madhya Pradesh, Maharashtra, Chhattisgarh, Uttarakhand, Gujarat and Punjab) by the date of January 23, 2021." Twelve countries have reported bird influenza for crow/migratory/wild birds—Madhya Pradesh, Haryana, Maharashtra, Chhattisgarh, Himachal Pradesh, Gujarat, Uttar Pradesh, Uttarakhand, Delhi, Rajasthan, Jammu and Kazakhstan and Punjab. Crow/pale samples from Uttarakhand's Rudraprayag, Lansdowne Forest Range, and Paudi Forest Range are negative for Avian Influenza, according to the release. Crow and peak samples from Uttar Pradesh's Fatehpur District have not. Via various media, including social media sites, the Department is raising disease awareness. On September 30, 2020, India was declared free of the disease just a couple of months after the last bird flu outbreak. The first avian influenza outbreak was recorded in India in 2006.Given the fear of bird flu, a comprehensive guide to food regulator FSSAI released earlier this week. It recommended that customers not eat half-boiled ovens and undercooked chicken and make sure that poultry meat was well cooked.

The Indian Food Safety and Standards Authority (FSSAI) has also called for consumers and food businesses 'not to panic,' ensuring that poultry meats and eggs can be handled and cooked safely. The authority has suggested that poultry meat and eggs are healthy to consume in the World Health Organisation (WHO). No epidemiological evidence indicates that the disease can pass to people through cooked food. The Minister said the control and containment activities in the affected epicentres of Maharashtra, Chhattisgarh, Punjab, Uttar Pradesh, Gujarat, Uttarakhand and Kerala (Cleansing and Disinfection) are carrying out. The Department has announced that. Compensation is paid to those farmers who, according to the action plan, are grown up/disposed from poultry, eggs and poultry feed. the Animal Husbandry & Dairying Department (DAHD) offers 50:50 sharing funds to countries and Union territories. All states report daily to the Department on control steps taken under 'the Updated Action Plan 2021 for Avian Influenza Prevention, Control and Containment.

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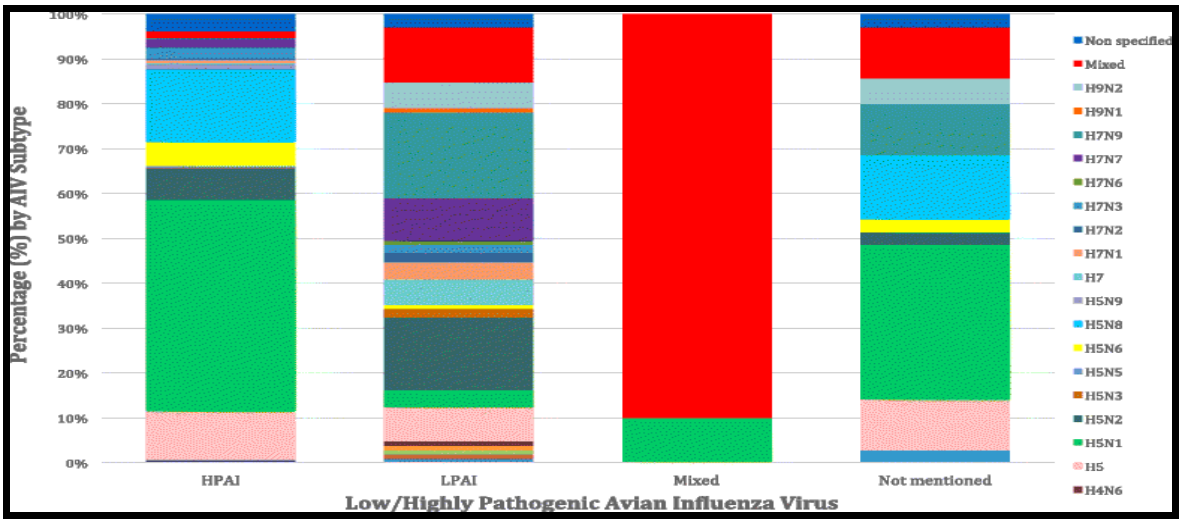

Fig. 1: Low (LPAI)/\highly (HPAI) pathogenic avian influenza virus upon avian influenza virus subtyp

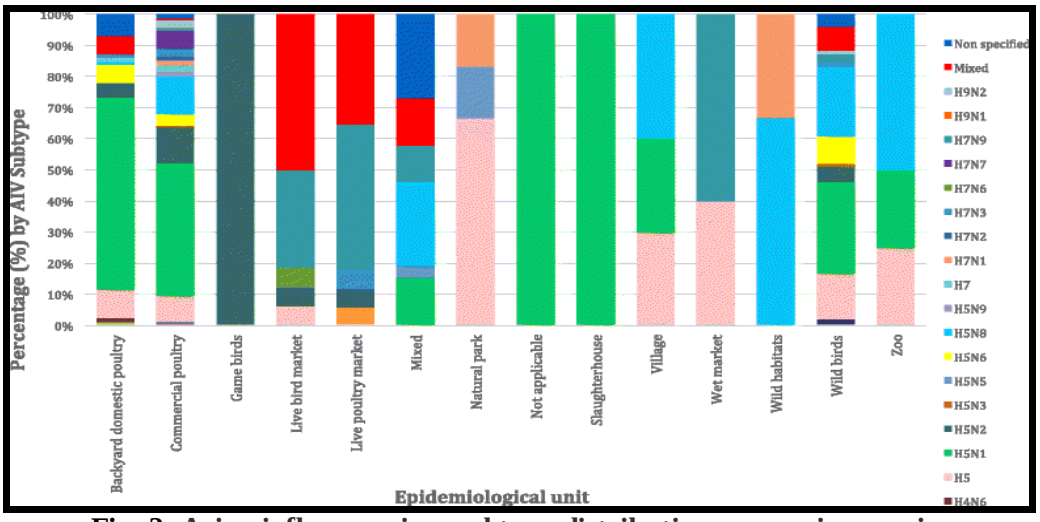

Fig. 2: Avian influenza virus subtype distribution upon avian species

Clinical manifestations of avian influenza in human

Recently two new human avian influenza A (H5N6) virus infections in China were announced in the Western Pacific by the World Health Organization (WHO). China, admitted on 22 December 2020 to a hospital with a serious illness, died. The second is a one-year-old woman from Anhui, China, who in December 2020 developed mild illness. Before the advent of disease, both cases were sporadic and had poltry exposure to markets. Since 2014, the Chinese WHO has been documenting 29 laboratory-confirmed cases of human influenza A(H5N6) viruses, including 9 deaths from China. Avian influenza is causes by influenza viruses which primarily affect poultry and birds like chickens or canards. Human hospitals include eye (conjunctivitis), flu-like symptoms (e.g. fiver, cough, sore throat and muscle aches) and serious respiratory disorders (e.g. chest infection). There are 7 to 10 days of incubation. Two distinct HPAI diseas observed throughout the European Union during 2020. On 31 December 2019, the first epidemic of HPAI began with the first poultry outbreak reported in Poland. The outbreak included a new HPAI subtype H5N8 virus (2020). In Poland, Czech

Republic, Germany, Hungary, Slovakia and Romania, the disease had been confirm by March. All these outbreaks were causes by the H5N8(2020) subtype of the HPAI virus. After the virus came into high density duck and geese holdings, the Member State most affected was Hungary. Their were also HPAI outbreaks in Bulgaria from March to June 2020, but the contaminated H5N8 was also founded in Bulgaria from 2018 to 2019. On 5 June 2020, the latest poultry outbreak associated with the first HPAI epidemic was reported. In the first half of 2020 there were only three wild birds contaminated with HPAI (in Germany and Poland). The same virus as the one found in the poultry farms was involved. The first case of HPAI was recorded in the Netherlands in wild birds, which launched the second epidemic season at the end of October 2020. The first observed HPAI virus was again H5N8, distinct from the virus circulating during the first half of the year. Infected by HPAI viruses of subtypesH5N8, H5N5, H5N1 and H5N3, detected by several EU countries and the UK, has been recorded between the and by the end of 2020, with a high number of death and disease wild birds (mostly migratory species). In Northern Germany, Denmark and the Netherlands, the largest number of cases were recorded in wild birds. In Croatia, Denmark, France, Ireland, Germany, Netherlands, Poland, Sweden and the United Kingdom, the disease was also confirmed in poultry between October and December 2020.

Diagnosis

Avian influenza infection is challenging to diagnose in humans clinically. It depends upon the epidemiological connection to endemic areas, interaction with sick and dead poultry or contact with a confirmation avian influenza case. As many infectious diseases are symptomatically similar, business with an endemic area or through traffic or contaminated poultry may be the only important thing to the clinician. The clinician should always reveal patient history. The final diagnosis consists of virus isolation from clinical specimens in culture. Also, the viral isolate is now available for further research, including pathogens, antiviral resilience and DNA sequencing and analysis not only provides the definitive diagnosis but. Alternatively, the usual 4-fold titer antibody testing may be carried to match the particular subtype of avian influenza virus. The microneutralization technique is used to neutralize titer samples of antimicrobials for H5, H7 and H9. A recombinant H5 western blot analysis is the confirmatory test for every positive microneutralization test. More recently, a simple diagnosis can be made on clinical samples with viral subtype primers by reverse transcription-PCR. Only patients who meet the case description of potential avian influenza A infection should undergo this examination.The public health authorities of the province or country of origin should review any reported cases of air flu in humans. Government laboratories, first libraries, and associated expertise are also fitted with sufficient bio level safety three laboratories to ensure the fast and efficient diagnosis is verified. Both clinical specimens with the aid of public health experts should be submitted.

Treatment

Treatment of avian influenza infections in humans requires antiviral therapy and supportive care. Regulated clinical studies on the effectiveness of antivirals (NA inhibitors), supportive treatment, or adjuvant care have never been conducting. Still, existing guidelines derive from previous prevention function experiences due to widespread resistance via an M2 protein alteration. Also, over 90 per cent of H1 and H3 human subtypes isolates during seasonal influenza have had the tolerance to the adamantanes. Their position has now been restricted to prevention when the circulation strain is known to be susceptible to the adamantanes. NA inhibitors (oseltamivir and zanamivir) have been tested for both treatment and prevention Resistance to oseltamivir has been reported in an In one study, the viral count of HPAI H5N1 in nasal secretions did not decrease with the administration of oseltamivir when the H5N1 isolate bore this resistance mutation. However, the resistance created by this change may be overcome with higher doses of oseltamivir in vitro. This change has not been

reported to confer resistance to Supportive zanamivir treatment with intravenous rehydration, mechanical ventilation, vasopressor therapy, and renal replacement therapy are needed if multiorgan failure and ARDS are a feature of the disease. Due to the progression of pneumonia to ARDS, non-invasive ventilation is not recommended, and early intubation may be helpful before overt respiratory failure ensues. Corticosteroids have been used in some patients with HPAI H5N1, but no conclusive role for steroids has been determined. There were no records of other immunomodulatory therapy.

Infection control

Controlling infections in health care is a crucial component in handling a pandemic of an avian influenza outbreak. Experience from the 2002 extreme ARDS outbreak showed that practical infection prevention efforts are necessary for reducing spread to health workers and, perhaps, to the community. The WHO and the Air Defense Centers should also be worn along with an impervious gown, face shield and gloves. First cases of 6 to 12 air changes per hour should be put in a negatively pressurized isolation room. Hand hygiene should be expected, in each patient room, with antibacterial soap or alcohol-based waste gel. seasonal vaccines should be performed and further stressed by all healthcare staff. To minimize the risk of spread, visitors and families should be strictly supervised and access restricted to the patient. Any health workers exposed to an infected person should also have antiviral chemoprophylaxis. Any worker who symptoms should be removed and monitoring should take place at the workplace. The Control and Prävention Case (CDC), recommended touch and airborne precautions for any initial suspected case of human avian influenza, is intended to minimize risk in healthcare staff, patients, and members of their families.

Conclusion

Viruses of Avian influenza have taken place, illustrating the delicate and interactive relationship between wildlife, domesticated animals and humans, with increased human population occurrence. Human illness may be restricted to conjunctivitis or flu-like disease, but the causes of HPAI H5N1 often are severe pneumonia. The majority of cases were caused by direct transmission from contaminated poultry or waterfowl, with few points of human to human communication. The treatment with NA inhibitors was successful early, and more immunogenic, attenuated preparation of the H5N1 virus is underway for the production of the vaccine. The critical pillar of prevention and disease mitigation is infection control measures. The next pandemic may include avian influenza viruses, which would minimize the risk of this occurrence by sufficient awareness, preventing, and treating them.

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