Short Communication

Avian Influenza (Bird Flu) an Emerging Threat

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The emergence of avian influenza, caused by the highly pathogenic H5N1 Influenza A virus, is a cause for great concern since this virus has the potential to trigger a pandemic. Three such pandemics have occurred in the last century; in 1918, 1957 and 1968 causing million of deaths. The 1918 pandemic was the most severe accounting for 20-40 million lives.[1] Influenza viruses continue to evolve, and new antigenic variants (drift, strains) emerge constantly, giving rise to yearly epidemics. In addition, strains to which most humans have no immunity appear suddenly, and the resulting pandemics vary from serious to catastrophic.[2]

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 (haemagglutinin [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.[4] "Human influenza virus" usually refers to those subtypes that spread widely among humans. There are only three known A subtypes of influenza viruses (H1N1, H1N2, and H3N2) currently circulating among humans.[3] Since the first human influenza virus was isolated in 1933, new subtypes of human type A influenza viruses have occurred: H2N2 (Asian influenza) replaced H1N1 in 1957, H3N2 (Hong Kong) virus appeared in 1968, and H1N1 virus reappeared in 1977. In 1957, the Asian pandemic virus acquired three genes (PB1, HA, and NA).[4] Aquatic birds are the reservoir of all 15 subtypes of influenza A viruses. In wild ducks, influenza viruses replicate preferentially in the cells lining the intestinal tract, cause no disease signs, and are excreted in high concentration in the faeces.[5]

Avian influenza viruses have been isolated from freshly deposited faecal material and from unconcentrated lake water, which indicates that waterfowl have a very efficient way to transmit viruses. Transmission by faeces also provides a way for wild ducks, as they migrate through an area, to spread their viruses to other domestic and wild birds.[6] Infected birds shed influenza virus in their saliva, nasal secretions, and faeces. 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.[3] Influenza viruses of avian origin have been implicated in outbreaks of influenza in mammals, such as seals, whales, and pigs, as well as in domestic poultry.[7]

The recent outbreak of bird flu has claimed more than 100 human lives across the globe. Pakistan is now included among the list of some 25 countries

where presence of deadly Avian Influenza H5N1 strain is confirmed. Most human cases, if not all, have been linked to direct exposure to dead or sick poultry. No case has occurred following consumption of properly cooked poultry meat or eggs.[8] This fact is confirmed by the guidelines of International Food Safety Authorities Network (INFOSAN) that conventional cooking (temperatures at or above 70°C in all parts of a food item) will inactivate the H5N1 virus. Properly cooked poultry meat is therefore safe to consume.[9]

Other recommendations of International Food Safety Authorities Network indicate that the virus is not killed by refrigeration or freezing. The greatest risk of infection is through the handling and slaughter of live infected poultry. Good hygiene practices are essential during slaughter and post slaughter handling to prevent exposure via raw meat. Eggs of infected poultry may contain virus both on the outside (shell) and the inside (whites and yolk). Eggs from areas with H5N1 outbreaks in poultry should not be consumed raw or partially cooked (runny yolk); uncooked eggs should not be used in foods that will not be cooked, baked or heat-treated in other ways.[9]

The recommendations for Avian Influenza by Centers for Disease Control and Prevention (CDC, USA) include use of gloves and gowns for all those who come in contact with the patient. Hand washing and use of disposable items can minimize chances of transmission of infection. All suspected cases of bird flu should be placed in isolation wards with standard infection control measures. Health care workers involved in the care of influenza patients should be vaccinated with the most recent seasonal human influenza vaccine.[10]

In order to deal effectively with this emerging new epidemic, we need to establish a National Bird Flu Task Force and link it with the international agencies working for the control of bird flu. The task force should comprise of specialist doctors, microbiologists, pathologists, veterinarians, epidemiologists, and experts from other related fields. This task force should monitor the bird flu situation in Pakistan and develop the guidelines and interventions for its control and prevention.

References

1. Avian Influenza: Responding to the pandemic threat, World Health Organization, Regional office for South-East Asia, New Delhi 2005. Available at URL www.who.int/birdflu
2. Murphy BR, Webster RG. Orthomyxoviruses. In: Fields BN, et al., editors, Field Virology, New York: Raven, 1998, p1397-1445.
3. Key facts about avian influenza (bird flu) and avian influenza A (H5N1) virus, Centers for disease control and prevention, 2006. Available at URL http://www.cdc.gov/flu/avian/gen-info/facts.htm.
4. Kawaoka Y, Krauss S, Webster RG. Avian to human transmission of the PBI gene of Influenza A virus in the 1957 and 1968 pandemics. J Virol 1989;63:4603-8.
5. Webster RG, Yakhno M, Hinshaw VS, Bean WJ, Murti KG. intestinal influenza: replication and characterization of influenza viruses in ducks. Virology 1978; 84:268-78.
6. Halvorson D, Karunakaran D, Senne D, Kelleher C, Bailey C, Abraham A, et al. Epizootiology of avian influenza-simultaneous monitoring of sentinel ducks and turkeys in Minnesota, Avian Dis 1983;27:77-85.
7. Horimoto T, Rivera E, Pearson J, Senne D, Krauss S, Kawaoka Y, et al. Origin and molecular changes associated with emergence of a highly pathogenic H5N2 influenza virus in Mexico. Virology 1995;213:223-30.
8. Avian Influenza: Responding to the pandemic threat, World Health Organization (WHO), 2005, New Delhi. Available at URL http://www.who.int/birdflu.
9. Highly pathogenic H5N1 avian influenza outbreaks in poultry and in humans: food safety implications, International Food Safety Authorities Network (INFOSAN), World HealthOrganization, 2005.
   Available at URL: http://www.who.int/foodsafety/fs_management/No_07_AI_Nov05_en.pdf.
10. Interim recommendations for infection control in health care facilities caring for patients with known or suspected avian influenza, Centers for disease control and prevention, 2004. Available at URL www.cdc.gov/flu/avian/facts.htm