EDITORIAL

Bird Flu [Avian & Human Influenza (H5N1) Infection]

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Influenza virus is known to cause epidemics every several years. There is now a threat to human kind by an infection with Influenza A (H5N1) virus. The virus is predominantly known to infect birds (avians) causing death even in a day of infection but now due to high infectivity, humans are known to get affected. Human Influenza infection by this virus is known to be highly fatal.

History:- First reported in 1997 in Hong Kong, this infection has now affected over 20 countries around the globe. Recent outbreaks in Kazakhstan, Mongolia, Russia and India indicate that humans are now at risk to this disease. Largest numbers of cases have occurred in Vietnam and 20 human deaths have been reported with the recent from Indonesia [1 - 3] .

Transmission:- Human influenza is transmitted by inhalation of infectious droplets, by direct contact or by fomite transmission [4, 5]. Bird-to-human, environment-to-human transmission is known with H5N1 virus however, evidence of human-to-human transmission is lacking. Exposure to live infected poultry is a risk to transmission. There is no risk related to eating or preparing poultry products [6].

Pathogenesis:- It is a highly pathogenic virus and possesses the poly basic amino acid sequence at the hemagglutinin-cleavage site that is associated with visceral dissemination in birds [7]. In humans, too invasive disease is seen. The virus continues to evolve with change in antigenicity and is able to affect wide range of birds and felids [8]. These genetic and biologic changes may lead to different affection in humans and may have effect on response to therapy as well as case fatality. However, despite wide spread exposure to infected poultry, the H5N1 virus affects humans with relatively low frequency and genetic factors may be also contributory.

Pathology:- This avian influenza virus (H5N1) leads to pneumonia with histology of alveolar spaces showing fibrinous exudates, hyaline-membrane formation, vascular congestion, infiltration of lymphocytes into the interstitial space and proliferation of reactive fibroblasts. Reactive histiocytosis with hemophagocytosis is known and atypical lymphocytes are seen in lymphoid tissue and spleen. Centrilobular hepatic necrosis and acute tubular necrosis (ATN) can also occur [9].

Clinical features:- The possibility of influenza A (H5N1) should be considered in all patients with severe acute respiratory illness in countries or areas with animal influenza A (H5N1) particularly in patients who have been exposed to poultry [1]. Sub-clinical and atypical presentations such as gastroenteritis may occur. After an incubation period of 2 to 8 days, most patients present with high fever, myalgia, cough with expectoration, sore throat and breathlessness [10-12]. Diarrhea, vomiting, abdominal pain, pleuritic pain and bleeding from gums and nose has been reported early in the course of the disease. Lower respiratory tract manifestations in form of respiratory distress, tachypnea and inspiratory crepitations are seen with 1-16 days of presentation [10]. Progression to adult respiratory distress syndrome (ARDS), multi organ failure in form of renal failure and cardiac dilation is common.

Laboratory findings:- Common hematological abnormalities that are seen are lymphopenia, thrombocytopenia and elevated liver enzymes. With renal failure, elevated creatinine levels occur. Radiographic changes include diffuse, multifocal or patchy infiltrates; interstitial infiltrates or segmental consolidation with air bronchograms. Progression to ARDS leads to diffuse bilateral ground glass appearance.

Diagnosis:- Virus isolation or RNA PCR specific for H5 virus from pharyngeal samples are the investigation of choice to confirm the diagnosis.

Management:- Whenever feasible, patients with suspected or proven influenza A virus should be hospitalized in isolation. Supportive care with oxygen and ventilators may be essential. Patients with suspected H5N1 influenza A should receive a neuraminidase inhibitor pending the result of diagnostic test. Oral Oseltamivir and topical Zanamivir have been found to be useful in animals with good in vitro susceptibility [13, 14]. Approved doses of Oseltamivir (75 mg twice daily for five days in adults, children < 15 kg - 30 mg twice a day, children between 15-23 kg – 45 mg twice a day, those between 23-40 kg – 60 mg twice a day and those above 40 kg – 75 mg twice a day) are good for treating early, mild cases. However higher doses and longer duration of treatment may be required in patients with severe disease.

High-level antiviral resistance to Oseltamivir by substitution of a single amino acid in N1 neuraminidase (His 274 Tyr) has been found recently

and hence one needs to use this drug with caution to prevent drug resistance [14]. Amantadine and Rimantidine have no therapeutic effect on the recent influenza A (H5N1) isolates. Role of corticosteroids is uncertain.

Prevention:- No influenza A (H5) vaccines are currently commercially available for human. However now several candidate vaccines and live attenuated intranasal vaccines are under study [15, 16]. Chemoprophylaxis with 75 mg of Oseltamivir once daily for 7 to 10 days to recommended for persons who have had a possible exposure to infected poultry [17]. Travelers to areas with avian influenza activity should be immunized with the available trivalent human vaccine preferably at least 2 weeks before traveling. Direct contact with poultry and touching surfaces contaminated with poultry feces or secretions should be avoided. Avoid ingestion of undercooked eggs or poultry foods. Health care workers should wear masks, long-sleeved cuffed gowns, eye goggles and gloves when taking care of affected patient.

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