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Out of the East – Emerging infections

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INTRODUCTION

Two new infections with pandemic potential have emerged from Asia in the new millennium. Severe Acute respiratory syndrome (SARS) originated from southern China and rapidly spread to many countries in early 2003 with over 8000 cases worldwide.1 Human infection due to a highly pathogenic avian influenza A (H5N1) virus was first described in a mini-outbreak from Hong Kong in 1997. Since 2003, there were many reports of the infection in wide birds and domestic poultry in many countries. Since then, more than 150 human cases and 80 deaths have been reported.2 Both infections are of animal origins and the viruses have jumped the species barrier. Children infected with SARS usually developed mild disease,3 but the reported mortality for children infected with avian flu was more than 50%.4 Early and proper isolation of infected individuals along with strict public health measures are important in controlling these infections.5

SARS IN CHILDREN: CLINICAL PRESENTATION, DIAGNOSIS AND TREATMENT

The outbreak of SARS started in late 2002 in southern China and the infection rapidly spread to many parts of the world within 3 months.1 Young children tend to have milder disease while older adolescents may have more serious illness similar to those in adults.3 Almost all pediatric cases got infected by exposure to infected adults. The incubation period is between 5–10 days. Children usually presented with fever and symptoms of upper respiratory tract infection. The initial radiograph is usually normal while early thoracic computer tomography may show poorly defined, ground glass opacifications of the lung in the subpleural areas.6 The typical laboratory findings are lymphopenia, thrombocytopenia and elevation of liver enzymes. The non-specific clinical and laboratory findings are no different from children with pneumonia due to other rival etiologies.5 SARS is caused by a newly identified coronavirus which is genetically very similar to strains of coronavirus isolated in wild animals sold in the markets in the Guangdong province of China.7 The most reliable rapid early diagnosis is by reverse-transcription-polymerase chain reaction to detect the virus in respiratory secretions.

The treatment of SARS in pediatric patients is supportive as the majority of patients will recover uneventfully.8 Currently, there is no known effective treatment for SARS. Although a variety of anti-virals along with steroids have been used during the outbreak in 2003, proper clinical trials are needed to evaluate these treatment strategies.9 Although the majority of pediatric patients will recover uneventfully, 40% of patients may have residual radiological abnormality and impaired peak oxygen consumption and lower oxygen uptake efficiency at 15 months follow-up.10

HUMAN INFECTION WITH AVIAN INFLUENZA

Avian influenza is a common infectious disease affecting many wild birds and domestic poultry. The first outbreak of human disease of avian influenza occurred in 1997 with 18 cases and 6 deaths.11 Since late 2003, there have been many reports of outbreaks of avian influenza (H5N1) in many countries in Asia, Europe, and Africa. Up till February 2006, there have been more than 150 human cases and 80
with interstitial lympho-plasmacytic infiltration and scattered histiocytes showing reactive hemophagocytic activity. Similar reactive hemophagocytic activity was also noted in the bone marrow and the spleen but the precise mechanisms resulting in the cytokine driven hemophagocytic syndrome remain to be explored.18

The optimal treatment for human H5N1 infections is still unclear. Because of the severity of this infection, patients suspected or proven to have H5N1 influenza should be hospitalized in facilities with strict isolation. They should be started on neuraminidase inhibitor while waiting for confirmatory testing.4 The exact dosage and duration of treatment are not known.

CONCLUSION

The successful control of the SARS outbreak has highlighted the importance of public health measures in controlling a newly emerged infection. Both SARS and avian flu are infections that have jumped the species barrier. The natural reservoir of the SARS coronavirus appears to be palm civet and raccoon dog. A national band in slaughtering and human consumption of these animals was highly successful in preventing re-emergence of SARS. The control of avian flu will be a lot more difficult, if not impossible, as the natural reservoirs are many species of birds and domestic poultry. To complicate the issue, many species of birds can carry the virus without any apparent signs of illness. If mutation of the virus occurs resulting in efficient human to human transmission, a pandemic resulting in significant global mortality is highly likely. There is an urgent need for effective monitoring of outbreak and carriage of avian flu in wild birds and domestic poultry. Development of effective immunization and anti-virals are necessary to control outbreak at the source. Proper isolation of infected cases and border control will be necessary to minimize the impact when large outbreaks of human cases do occur.

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