

## Avian Influenza A (Bird Flu): Is the Threat Real?

Avian influenza is an infectious disease of birds caused by type A strains of the influenza virus. During the 20th century, the world experienced 3 pandemics caused by influenza A virus subtypes: the great influenza pandemic of 1918–1919 (Spanish flu; H1N1 virus), which caused an estimated 40 million to 50 million deaths worldwide, and the pandemics of 1957–1958 (Asian flu; H2N2 virus) and 1968–1969 (Hong Kong flu; H3N2 virus). In late 2003 and early 2004, new outbreaks of lethal avian influenza A (H5N1 virus) infection in poultry were reported by several Asian countries: China, Cambodia, Malaysia, South Korea, Thailand, Vietnam, Japan, Indonesia, and Laos.<sup>1,4</sup> Since May 2005, outbreaks of H5N1 disease have been reported in poultry in China, Egypt, Iraq, Kazakhstan, Niger, Romania, Russia, Turkey, and Ukraine. In the same period, outbreaks of H5N1 in migratory birds were reported in Austria, Bulgaria, Bosnia-Herzegovina, China, Croatia, France, Greece, Germany, Hungary, Italy, Iran, Mongolia, Romania, and Slovenia.<sup>2,3</sup> As of March 10, 2006, a total of 176 confirmed cases of avian influenza A (H5N1) in humans had been reported to the World Health Organization; of these, 97 were fatal.<sup>5</sup>

Flu viruses such as H5N1 occur naturally among birds. Wild birds around the world carry the viruses in their intestines but usually do not get sick. However, avian influenza is highly contagious among birds and can cause illness and death in domesticated birds, including chicken, duck, and turkey.<sup>2,5</sup>

The H5N1 virus has already shown 2 characteristics of previous pandemic flu strains: the ability to infect the human population and the ability to cause severe disease when such human infection occurs. So far, the virus has not shown the ability to pass easily among people. Avian influenza is transmitted by inhalation of infectious droplets and droplet nuclei, by direct contact, and perhaps by indirect contact through self-inoculation of the upper respiratory tract or conjunctival mucosa. Oral ingestion of contaminated water during swimming and direct intranasal or conjunctival inoculation during exposure to water are other potential modes of transmission.<sup>2,4</sup>

Symptoms of avian influenza in humans have ranged from typical flulike symptoms (fever, cough, sore throat, and myalgia) combined with lower respiratory tract symptoms to eye infections, pneumonia, severe respiratory disease, and other life-threatening complications. Diarrhea, vomiting, abdominal and pleuritic pain, and bleeding from the nose and gums have also been reported. Common laboratory findings have been leukopenia, mild to moderate thrombocytopenia, and elevated levels of aminotransferase.<sup>3,6</sup> Diagnosis has been confirmed by viral isolation, the detection of specific RNA, or both methods. Most patients with avian influenza A who have been admitted to hospital have required intensive care with ventilatory support.<sup>6</sup>

Empirical treatment with broad-spectrum antibiotics, antiviral agents, and corticosteroids has been used for most patients, although the effects of these treatments have not been vigorously assessed. No influenza A (H5) vaccine is commercially available for human use at this time. The H5N1 virus is resistant to rimantadine and amantadine. Oseltamivir and zanamivir are the primary treatment options, but additional studies are required to demonstrate their clinical utility and effectiveness.<sup>4,6-10</sup>

Isolation precautions, including negative pressure rooms, high-efficacy masks (N-95 or equivalent) long-sleeved gowns, face shield, and gloves, are recommended for health care workers in health care facilities.<sup>6</sup> Prophylaxis with 75 mg oseltamivir once daily for 7 to 10 days is warranted for anyone who has had possible exposure. Household contacts of persons with confirmed avian influenza should receive postexposure prophylaxis, and their symptoms should be monitored closely.<sup>6</sup>

As of March 2006, no cases of avian influenza (H5N1) had been detected in wild birds, domestic poultry, or people in North America. Although exposure to the bird flu is currently not a threat in North America, health care workers and the general public should be aware of all aspects of this disease. In particular, people should not handle diseased or dead wildlife, and they should contact provincial, state, or federal natural resource agencies if a sick or dead animal is found.

### References

1. Abbott A, Cyranoski D. Bird flu sparks worldwide bid to prevent human pandemic. *Nature* 2004;427:274.
2. Key facts about avian influenza (bird flu) and avian influenza A (H5N1) virus [Internet]. Atlanta (GA): Centers for Disease Control and Prevention; [cited 2006 Jan 11]. Available from: <http://www.cdc.gov/flu/avian/gen-info/facts.htm>
3. Recent avian influenza outbreaks in Asia and Europe [Internet]. Atlanta (GA): Centers for Disease Control and Prevention; [cited 2006 Jan 14]. Available from: <http://www.cdc.gov/flu/avian/outbreaks/asia.htm>
4. Bartlett GJ, Hayden GF. Influenza A (H5N1): will it be the next pandemic influenza? Are we ready? *Ann Intern Med* 2005;143:460-2.
5. Confirmed human cases of avian influenza A (H5N1) [Internet]. Geneva (Switzerland): World Health Organization; 2006 [cited 2006 Mar 10]. Available from: [http://www.who.int/csr/disease/avian\\_influenza/country/en/](http://www.who.int/csr/disease/avian_influenza/country/en/).
6. Beigel JH, Farrar J, Han AM, Hayden FG, Hyer R, de Jong MD, et al; Writing Committee of the World Health Organization (WHO) Consultation on Human Influenza A/H5. Avian influenza A (H5N1) infection in humans. *N Engl J Med* 2005;353:1374-85. Erratum in: *N Engl J Med* 2006;354:884.
7. Leneva IA, Golubeva O, Fenton RJ, Tisdale M, Webster RG. Efficacy of zanamivir against avian influenza A viruses that possess genes encoding H5N1 internal proteins and are pathogenic in mammals. *Antimicrob Agents Chemother* 2001;45:1216-24.



8. Gubareva LV, McCullers JA, Bethell RC, Webster RG. Characterization of influenza A/HongKong/156/97 (H5N1) virus in a mouse model and protective effect of zanamivir on H5N1 infection in mice. *J Infect Dis* 1998;178:1592-6.
9. Leneva IA, Roberts N, Govorkova EA, Goloubeva OG, Webster RG. The neuraminidase inhibitor GS4104 (oseltamivir phosphate) is efficacious against A/Hong Kong/156/97 (H5N1) and A/Hong Kong/1074/99 (H9N2) influenza viruses. *Antiviral Res* 2000;48:101-15.
10. Ward P, Small I, Smith J, Suter P, Dutkowski R. Oseltamivir (Tamiflu) and its potential for use in the event of an influenza pandemic. *J Antimicrob Chemother* 2005;55 Suppl 1:i5-i21.

---

**Jean G Dib**, PharmD  
Clinical Pharmacist—Supervisor

**Saud Abdulmohsin**, RPh, MS  
Chief Pharmacist  
Pharmacy Services Division  
Saudi Aramco Medical Service Organization (SAMSO)  
Dhahran, Saudi Arabia

---