



The first confirmed human case of avian influenza A (H5N1) in Mainland China

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Lancet 2006; 367: 84

Published online

December 20, 2005

DOI:10.1016/S0140-6736(05)

67894-4

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On Oct 8, 2005, a previously healthy 12-year-old girl in rural Hunan, China, developed fever, sore throat, and cough. She consulted a village outpatient clinic 4 days later, and was admitted to the local hospital on Oct 13. On admission she had a fever (40·4°C), and chest radiography showed shadowing in the left middle and lower lobes. Blood tests showed white cell count $3\cdot28\times 10^9/L$, lymphocytes $0\cdot64\times 10^9/L$, platelets $94\times 10^9/L$, alanine aminotransferase 80 IU/L, and creatinine 99 mmol/L. On Oct 16, she was taken to the Hunan Provincial Children's Hospital because of increasing dyspnoea and cyanosis. Chest radiography showed diffuse bilateral consolidation with air bronchogram. Her condition continued to deteriorate despite oxygen therapy, broad spectrum antibiotics (azithromycin, cefotaxime), and corticosteroid treatment, and she was intubated and ventilated on the same day. She died of acute respiratory distress syndrome, disseminated intravascular coagulation, and multiorgan distress syndrome on Oct 17.

In the meantime, her 9-year-old brother developed fever and cough on Oct 10. He was admitted to hospital on Oct 17 where he responded to treatment including amantadine, ribavirin, corticosteroids, and broad spectrum antibiotics; he was discharged on Nov 12. At his final follow-up on Dec 9, 2005, he remained asymptomatic.

Under the nationwide surveillance system established in July, 2004, patients admitted with pneumonia of unexplained origin are reported to the Chinese Center for Disease Control and Prevention. This family cluster was recognised on Oct 18. Like other families in the rural area, backyard poultry-raising is commonly practised; before the outbreak, the family had 22 chickens and five ducks kept in cages in a confined area adjacent to the bathroom and toilets within the house. Because of the National Day holidays (from Oct 1 to Oct 7), children were in the house for a longer period of time. It was noted in retrospect that a few chickens and ducks had begun to die in the village from Sept 16. Between Oct 6 and Oct 12, up to six birds in the affected household died per day; by Oct 19, only one chicken and one duck remained alive. The mother cooked the dead and dying birds for consumption by the family. The patients' close contacts—totalling 191 persons—were all healthy following medical observation for 10 days after their last exposure to the two cases. Only one serum specimen taken 8 days after onset of symptoms could be obtained from the girl, which was negative for H5-specific antibodies in both microneutralisation and haemagglutination-inhibition assays against the A/Hunan-Xiangtan-he/12/2005 virus, which was isolated from the only live chicken remaining in the

household. The boy's samples, collected on days 8, 17, and 22 after the onset of the illness, showed a 4-fold or greater rise in antibody titre. Throat swabs for RT-PCR were, however, negative. The HA gene of the virus is closely related to that of H5N1 viruses isolated from poultry in Fujian Province in 2005, belonging to clade 2. The aminoacid residues involved in the receptor-binding site of haemagglutinin are similar to those of other H5 viruses, with α 2-3 sialic acid receptor binding specificity, and the haemagglutinin has a polybasic aminoacid cleavage site (RERRRRR).¹

The 12-year-old girl in the cluster is the first clinically diagnosed case of human H5N1 infection reported in mainland China, 8 years after the first documented outbreak in Hong Kong.² Although another family cluster in Hong Kong in 2003 gave a previous history of travel to Fujian Province, the specific source of the infections was not ascertained.³ Clinically, the respiratory distress in the infected children was similar to that reported elsewhere, and human-to-human transmission appeared to be inefficient.⁴ It is plausible that our cases had acquired the virus from diseased poultry rather than from one another. Our investigation highlights the major public health challenges in the unique setting of backyard farming where infection control measures remain to be improved, and where access to diagnosis and treatment is often limited. Hopefully, lessons from this and other cases will be translated into effective strategies to minimise the adverse impact of pathogenic H5N1 infections.

Conflict of interest statement

None declared.

Role of the funding source

The entire investigation was supported by Chinese Center for Disease Control and Prevention, Hunan Provincial Center for Disease Control and Prevention, and by 973 programmes 2005CB523005.

Acknowledgments

We thank Hunan Provincial Health Bureau, Xiangtan City CDC, Xiangtan County CDC, Maternity and Children Hospital in Xiangtan City and Hunan Provincial Children's Hospital for assisting in coordinating investigations and providing logistics support. We thank Shui Shan LEE (Center for Emerging Infectious Diseases, The Chinese University of Hong Kong) for assistance in preparing the manuscript.

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