Commentary

Is influenza A/H10N8 a potential candidate for the next pandemic?

Emanuele Montomoli, Trombetta Claudia Maria

Department of Molecular and Developmental Medicine, University of Siena, Italy

Invited Commentary on 'Clinical and epidemiological characteristics of a fatal case of avian influenza A H10N8 virus infection: a descriptive study', by Chen et al.

The first H10N8 avian influenza virus was isolated from a duck in Guangdong in the beginning of 2012. The strain was A/Duck/Guandong/E1/2012 (H10N8) and the HA gene belonged to the Eurasian lineage while the NA to the North America lineage.¹

Chen *et al.*² reported the first human case of infection by a novel reassortant avian influenza A H10N8 virus in 2013. The virus, A/Jiangxi-Donghu/346/2013 (JX346), was identified by sequencing the tracheal aspirate samples from the patient on day 7 after the onset of illness. The patient was a 73-year-old woman who visited a live poultry market 4 days before becoming ill. She bought a chicken, but she denied any contact with the chicken itself, live poultry, or ill individuals in the two weeks preceding the illness. All her close contacts have been identified but none of them showed signs of illness. Phylogenetic analysis of JX346 demonstrated that the HA gene belongs to the Eurasian avian lineage, while the NA gene to a subclade of the North American lineage.

All the six internal genes of the JX346 virus appear to be derived from the H9N2 viruses circulating in poultry in China, but show significant differences from the other H10 and N8 subtype viruses previously reported.

One restrictive aspect could be the case history of the patient, presenting hypertension, coronary heart disease, myasthenia gravis, and thymectomy that could have contributed to the death of the patient. On the other hand, in the months following such event, two further human cases of infection by H10N8 virus have been confirmed, one of which resulted fatal.

The inability to confirm the source of human infection from an identical H10N8 virus in the live poultry market leads to uncertainty about the source

of infection even if the experience with other avian influenza virus such as H5N1 and H7N9 proves that live poultry markets are significant sources of human infection with avian viruses.¹ Asymptomatic infections could promote the circulation of the virus resulting in silent outbreaks in poultries and, as for A/H7N9, would become evident only after the first clinical cases in humans.^{2,3}

Su *et al.*⁴ provided the first evidence of feral dogs' serum samples positive to the H10N8 virus. All positive samples have been collected between March 2013 and June 2013 from Guangdong, a province, and lived near a live poultry market. Such findings highlight the importance of surveillance not only among poultry, but also in other domestic animal species.

Samples from close contacts (health-care providers and family members) have been analyzed by RT-PCR test and/or haemagglutination inhibition assay and resulted negative.

Considering the inexperience with this novel avian influenza virus and the underestimation of HI assay to detect antibody responses induced by H5 viruses, further analysis with other serological assays, such as virus neutralization, could be useful to confirm the results of samples collected.

This report provides particular relevance since it represents the first case of human infection by a novel reassortant avian influenza virus H10N8. Recently, a new avian influenza virus, H5N6, has been reported in humans, causing the death of a man in China.⁵ The appearance of novel reassortant viruses able to infect humans may be cause of concern since the probability of influenza strains developing human to human transmission increases, in turn contributing to the possible emergence of an influenza pandemic event.

References

- 1 Jiao P, Cao L, Yuan R, Wei L, Song Y, Shen D, *et al.* Complete genome sequence of an H10N8 avian influenza virus isolated from a live bird market in southern China. *J Virol.* 2012; 86:7716.
- 2 Chen HY, Yuan H, Gao R, Zhang J, Wang D, Xiong Y, *et al.* Clinical and epidemiological characteristics of a fatal case of avian influenza A/H10N8 virus infection: a descriptive study. *Lancet.* 2014;383:714–21.
- 3 To KK, Tsang AK, Chan JF, Cheng VC, Chen H, Yuen KY. Emergence in China of human disease due to avian influenza A(H10N8) — cause for concern? *J Infect.* 2014;68:205–15.
- 4 Su S, Qi W, Zhou P, Xiao C, Yan Z, Cui J, *et al.* First evidence of H10N8 avian influenza virus infections among feral dogs in live poultry markets in Guangdong Province, China. *Clin Infect Dis.* 2014;59:748–50.
- 5 Available from: <http://www.wpro.who.int/china/mediacentre/releases/2014/20140507/en/> (accessed 7 May 2014).

Correspondence to: E. Montomoli, Department of Molecular and Developmental Medicine, University of Siena, Siena, Italy. Email: emanuele.montomoli@unisi.it