

Positive correlation between swine-origin influenza A (H1N1) virus infection and severe respiratory disease

Two studies were carried out in Mexico in March and April 2009 in the wake of a wave of infections with swine-origin influenza A (H1N1) virus (S-OIV).

The first study focused on the clinical and epidemiological features of the first 18 cases of S-OIV infection confirmed by laboratory analysis of nasopharyngeal swabs and bronchial aspirates subjected to RT-PCR that progressed within 5–7 days to pneumonia. The patients were admitted to a tertiary care centre for respiratory diseases in Mexico in the period between 24 March and 24 April 2009. Their median age was 38 years, with 10 of the 18 patients being previously healthy and all presenting with similar clinical features of fever, cough and respiratory distress and/or dyspnoea. Laboratory features included raised lactate dehydrogenase, aminotransferase and creatine kinase levels and lymphopenia. All patients were treated with antiviral agents and antibiotics. Ten of the 18 went on to develop respiratory distress necessitating intubation and mechanical ventilation, and 7 of the 18 patients died. Those with confirmed S-OIV infection were observed to have more severe disease and a higher death rate than those with negative laboratory results. PCR assays for other respiratory viruses and atypical bacteria were negative, ruling out concurrent bacterial infection as a cause of the pneumonia.

The second study focused on the age distribution of morbidity and mortality rates of patients in Mexico presenting with pneumonia in conjunction with confirmed S-OIV infection in the period between 24 March and 29 April 2009. 87% of deaths and 71% of pneumonia cases involved a population aged 5–59 years, a relatively younger cohort than that affected by the usual seasonal wave of influenza. This finding was mirrored by studies of previous influenza epidemics in Mexico.

Both studies used identical diagnostic methods to confirm the presence of S-OIV infection in the patients. The epidemic resembles previous influenza epidemics in its atypical timing of onset which, in Mexico, is usually between the months of October and March. Another notable feature in common with previous epidemics was the age shift in disease severity and death rates to a relatively younger population. One factor explaining this phenomenon could be a level of protection offered by previous exposure of people aged >60 years to influenza A (H1N1) strain which was in circulation between 1918 and 1957. The possibility of seasonal vaccination protecting against infection was not evaluated in either study. The novelty of the current epidemic is that it demonstrates sustained human-to-human transmission resulting from a possible host species jump by the virus.

These studies illustrate the risk factors and the clinical and epidemiological features of an influenza epidemic so that countries may prepare for potential future influenza pandemics with reserves of vaccines, antiviral and antibiotic drugs, diagnostic reagents, infection control measures and prioritisation strategies for their implementation.

- Perez-Padilla R, de la Rosa-Zamoni D, Ponce de Leon S, *et al.* Pneumonia and respiratory failure from swine-origin influenza A (H1N1) in Mexico. *N Engl J Med* 2009;**361**:680–9.
- Chowell G, Bertozzi SM, Colchero MA, *et al.* Severe respiratory disease concurrent with the circulation of H1N1 influenza. *N Engl J Med* 2009;**361**:674–9.

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