

## LETTERS

## Clinical outcomes of pandemic (H1N1) 2009 influenza (swine flu) in adults with cystic fibrosis

Patients with cystic fibrosis (CF) suffer recurrent bacterial pulmonary infections, but viral infections can also cause acute clinical deterioration.<sup>1</sup> Certain patient groups suffer increased morbidity following pandemic (H1N1) 2009 influenza (swine flu),<sup>2</sup> but there are few previous reports of outcomes in individuals with CF.<sup>3–5</sup> The West Midlands, along with Greater London, has had the highest incidence of H1N1 influenza in the UK.<sup>5</sup> We therefore examined the outcomes of patients diagnosed with H1N1 influenza at the West Midlands Adult CF Centre.

From June 2009 to April 2010 all adults with CF at our regional centre with potential H1N1 influenza had nasopharyngeal swabs tested by PCR. PCR testing was instituted in patients with fever >38°C together with one or more of the following: sore throat, rhinorrhoea, loose bowel motions, myalgia and headache. We documented clinical management, as well as lung function and body mass index (BMI) at the visit prior to their febrile illness and at their subsequent clinic visit. We used paired and unpaired Student t test and Mann–Whitney U test as indicated.

Out of our total patient population of 325 adults with CF, 45 patients had nasopharyngeal swabs tested by PCR over the study period. Thirteen patients (4% of our patient population) tested positive ('H1N1 +ve' group) and 32 patients (9.8%) tested negative for H1N1 influenza ('H1N1 –ve group'). In three of the 'H1N1 –ve' group, PCR was positive for alternative viruses (1 adenovirus, 1 parainfluenza type 4, and 1 herpes simplex type 1).

There were no statistically significant differences in baseline clinical characteristics between the two groups (table 1). Presenting symptoms in the 'H1N1 +ve' group were: fever >38°C (13/13 patients), increased sputum production (13/13), sore throat (8/13), myalgia (5/13), nausea/vomiting (5/13) and headache (2/13). Fever, increased sputum production, nausea/vomiting and headaches were similarly common in the

'H1N1 –ve group'; however, none of the patients in the 'H1N1 –ve group' complained of sore throat or myalgia. Blood test results showed a trend towards lower total white cell count and C-reactive protein (CRP) in the 'H1N1 +ve' group compared with the 'H1N1 –ve' group. All patients initially received antibiotics and oseltamivir, and in 'H1N1 +ve' patients oseltamivir was continued for a median of 10 days. Nine of the 13 patients in the 'H1N1 +ve group' required hospital admission, but there were no differences in duration of hospital admission or requirement for antibiotics between the two groups. There were no statistically significant differences in clinical outcomes between the 'H1N1 +ve' and 'H1N1 –ve' groups. In both the 'H1N1 +ve' and 'H1N1 –ve' groups there was a non-significant decrease in FEV<sub>1</sub> (forced expiratory volume in 1 s) % predicted, FVC (forced vital capacity) % predicted (table 1) and BMI. None of the patients in the 'H1N1 +ve' group had new changes on their chest radiograph or required ventilatory support.

In our experience, adults with CF have generally experienced a relatively mild illness as a result of the first influenza pandemic of the 21st century. However, the CF community is well aware of the potential implications of a subsequent more virulent pandemic in future years.

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## Immunogenicity and safety profile of the monovalent A/H1N1 MF59-adjuvanted vaccine in patients affected by cystic fibrosis

Viral respiratory tract infections may determine lung function deterioration in patients affected by cystic fibrosis (CF). Viruses may have a synergistic action with bacteria to damage the respiratory tract; they may also promote airway bacterial colonisation.<sup>1</sup> Influenza virus infection has been described to increase the number of CF pulmonary exacerbations and the incidence of hospitalisation.<sup>2</sup> For this reason, vaccination is strongly recommended annually. The immunogenic effect and safety of influenza vaccines in CF children are comparable with that of healthy individuals.<sup>3</sup> The reported adverse events after vaccination are mild and not persisting. In 2009, a novel swine pandemic influenza A virus (A/H1N1) was identified. To date, the outcome of H1N1 infection has been described only in CF adults,<sup>4</sup> and no data are available about the safety and immunogenicity of the A/H1N1 vaccine administered to CF patients. The aim of our study was to evaluate safety and immunogenicity of the monovalent A/H1N1 MF59-adjuvanted surface antigen vaccine administered to CF patients. All CF patients aged 6 months to 26 years and followed at the referral Centre of the Bambino Gesù Children's Hospital (Rome, Italy) were assessed for eligibility. Exclusion criteria were a contraindication for the influenza vaccine or a previous documented H1N1 virus infection. All subjects received one dose of

**Table 1** Patient characteristics and lung function data

	Age, median (range)	Male, n (%)	Chronic <i>Pseudomonas</i> airway infection, n (%)	CF-related diabetes, n (%)	CF liver disease, n (%)	Transplant recipient, n (%)	FEV <sub>1</sub> % predicted prior to presenting illness, mean ± SD	FEV <sub>1</sub> % predicted following presenting illness, mean ± SD	FVC % predicted prior to presenting illness, mean ± SD	FVC % predicted following presenting illness, mean ± SD
'H1N1 +ve' group (n=13)	22 (17–48) years	6 (46.2%)	13 (100%)	7 (53.8%)	6 (46.2%)	3 (23.1%)	51.4 ± 18.3%	46.5 ± 16.7%	67.4 ± 17.9%	64.0 ± 19.9%
'H1N1 –ve' group (n=32)	26 (15–59) years	15 (46.9%)	31 (96.9%)	24 (75%)	6 (18.8%)	3 (9.4%)	50.7 ± 20.9%	49.8 ± 19.5%	66.4 ± 23.4%	65.0 ± 20.9%

CF, cystic fibrosis; FEV<sub>1</sub>, forced expiratory volume in 1 s; FVC, forced vital capacity.