Letter

# Presentation and management of critically ill patients with influenza A (H1N1): a UK perspective

Joyce HY Yeung[1], Mark Bailey[1], Gavin D Perkins[1,2] and Fang Gao Smith[1,2]

[1]Heart of England NHS Foundation Trust, Birmingham Heartlands Hospital, Bordersley Green East, Birmingham, B9 5SS UK
[2]University of Warwick, Warwick Medical School, Clinical Trials Unit, Gibbet Hill Road, Coventry CV4 7AL UK

Corresponding author: Fang Gao Smith, Fang.gao@warwick.ac.uk

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We read with interest the recent report from Spain [1] and would like to report the presentation and management of patients with H1N1 on our intensive care unit.

As of September 2009, over 254,000 people have been affected worldwide with at least 2,800 deaths. The UK has one of the highest numbers of confirmed cases in Europe [2]. Between June and September 2009, there were 78 confirmed cases of H1N1 flu admitted to Birmingham Heartlands Hospital. These patients were predominantly young (median 30.5 years, interquartile range 23 to 53) and female (79.5%); 10 (16%) patients were pregnant, 19 (24.3%) patients had chronic lung disease and 24 (30.8%) patients had no underlying medical problems.

Seven patients (three male, four female) developed rapidly progressive respiratory failure and required intensive care admission. Compared with the Spanish study, our patients were similarly young (median age 35 years, interquartile range 30 to 48). Four out of seven patients were of ethnic minority. The presentation was similar, with fever ($n = 7$), respiratory symptoms ($n = 7$), flu-like illness ($n = 5$), gastrointestinal upset ($n = 2$) and confusion ($n = 1$). Co-morbidities included obesity (body mass index 30 to 35, $n = 3$), chronic respiratory illness ($n = 2$), ischaemic heart disease ($n = 2$) and diabetes mellitus ($n = 1$). These seven patients' Acute Physiology and Chronic Health Evaluation II scores were higher, with a mean of 16 (standard deviation 2), and they had a predicted mortality of 35 (standard deviation 26). Chest X-ray scans of critically ill patients started with mild changes but rapidly developed bilateral changes consistent with acute respiratory distress syndrome (ARDS). Only one patient developed multiorgan failure requiring vasopressors and haemofiltration.

Profound hypoxaemia was evident in all patients despite them having normal lung compliance and receiving mechanical ventilation. Airway pressure release ventilation was used on five patients with no significant benefit. Two patients required transfer for venovenous extracorporeal membrane oxygenation (ECMO) at ventilation days 16 and 17 due to refractory hypoxaemia. In contrast to previous reports [3,4], pulmonary embolism was not a feature. Paralytic ileus was common and double dosages of antiviral treatment were administered to ensure absorption. Six patients were alive on discharge and one patient (with significant premorbid co-morbidities) did not survive, giving a 28-day mortality of 14.3%.

## Authors' response

Jordi Rello and Alejandro Rodríguez, for the H1N1 SEMICYUC Working Group

We appreciate the interest from Dr Yeung and colleagues in our article and their insightful observations regarding management of severe influenza A (H1N1)v. The observed intensive care unit mortality (14.3%) described by Yeung and colleagues is similar to previous reports [5,6]. In our study the mortality rate was 30%; 75% of patients required mechanical ventilation due to severe hypoxemia, and 33% of them required the prone position [1]. ECMO, however, was not available.

The impact of ECMO on survival of patients with ARDS remains controversial. In a recent study in patients with influenza (H1N1) and ARDS treated with ECMO, the mortality

ARDS = acute respiratory distress syndrome; ECMO = extracorporeal membrane oxygenation.

was 23% [7]. This rate is higher than the mortality reported in patients with ARDS without ECMO (9%), but is significantly lower than that reported with the use of ECMO for ARDS due to heterogeneous aetiology (30 to 48%). Recent evidence suggests using ECMO may be a cost-effective strategy for management of ARDS patients [8]. The impact of ECMO on mortality in severe respiratory failure by influenza A may be associated with the specific population included (young people with ARDS secondary to viral pneumonia). Which advanced respiratory rescue technique, such as ECMO or high-frequency oscillation, is preferred should be further assessed by randomized controlled trial.

## Competing interests

The authors declare that they have no competing interests.

## References

1. Rello J, Rodríguez A, Ibañez P, Socias L, Cebrian J, Marques A, Guerrero J, Ruiz-Santana S, Marquez E, Del Nogal-Saez F, Alvarez-Lerma F, Martínez S, Ferrer M, Avellanas M, Granada R, Maraví-Poma E, Albert P, Sierra R, Vidaur L, Ortiz P, Prieto Del Portillo I, Galván B, León-Gil C; the H1N1 SEMICYUC Working Group: **Intensive care adults patients with severe respiratory failure caused by influenza A (H1N1)v in Spain.** *Crit Care* 2009, **13:**R148.
2. **Pandemic (H1N1) Update 58** [http://www.who.int/csr/don/2009_07_06/en/index.html]
3. **Intensive-care Patients with Severe Novel Influenza A (H1N1) Virus Infection – Michigan, June 2009** [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5827a4.htm]
4. **Pandemic H1N1 2009 Clinical Practice Note – Managing Critically Ill Patients** [http://www.rcoa.ac.uk/docs/H1N1_guidance.pdf]
5. The ANZIC Influenza Investigators: **Critical care services and 2009 H1N1 influenza in Australia and New Zealand.** *N Engl J Med* 2009, **361:**1925-1934.
6. Kumar A, Zarychanski R, Pinto R, Cook DJ, Marshall J, Lacroix J, Stelfox T, Bagshaw S, Choong K, Lamontagne F, Turgeon AF, Lapinsky S, Ahern SP, Smith O, Siddiqui F, Jouvet P, Khwaja K, McIntyre L, Menon K, Hutchison J, Hornstein D, Joffe A, Lauzier F, Singh J, Karachi T, Wiebe K, Olafson K, Ramsey C, Sharma S, Dodek P, *et al.*; for the Canadian Critical Care Trials Group H1N1 Collaborative: **Critically ill patients with 2009 influenza A (H1N1) infection in Canada.** *JAMA* 2009, **302:**1872-1879.
7. The Australia and New Zealand Extracorporeal Membrane Oxygenation (ANZ ECMO) Influenza Investigators: **Extracorporeal membrane oxygenation for 2009 influenza A(H1N1) acute respiratory distress syndrome.** *JAMA* 2009, **302:**1888-1895.
8. Peek GJ, Mugford M, Tiruvoipati R, Wilson A, Allen A, Thalanany MM, Hibbert CL, Truesdale A, Clemens F, Cooper N, Firmin RK, Elbourne D; for de CESAR Trial Collaboration: **Efficacy and economic assessment of conventional ventilator support versus extracorporeal membrane oxygenation for severe adult respiratory failure (CESAR): a multicentre randomized controlled trial.** *Lancet* 2009, **374:**1351-1363.