Comparison of critically ill patients between different outbreaks caused by pandemic H1N1 2009 influenza virus in Okinawa, Japan

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Accepted 20 June 2011. Published Online 14 July 2011.

Keywords Influenza, outbreaks, pandemic, severe patients.

To the editor:

In Okinawa, Japan, we have experienced two epidemics of influenza caused by the pandemic H1N1 2009 virus. Given this epidemic history, we compared the characteristics of critically ill (intubated) patients observed during the first epidemics (2009–2010) and during the first post-pandemic seasonal activity (2010–2011) caused by pandemic H1N1 2009 in Okinawa, Japan.

Upon initial analysis, it was observed that the durations of these two influenza epidemics were significantly different. For the first epidemics, the outbreak of influenza started in August 2009 and ended in February 2010 (7 months' duration). In contrast, in the first post-pandemic seasonal

activity, the outbreak started in December 2010 and ended in February 2011 (3 months' duration). The duration of the first epidemics was much longer despite the peak level being lower. In contrast, the pattern of the epidemic for the first post-pandemic seasonal activity closely resembled that for seasonal influenza.

There have been several previous reports that compared differences between the first and second waves of epidemics during the same 2009–2010 season.^{1–5} However, there is only one report that compared the clinical features observed between the two influenza seasons.⁶ It was reported that the second year of pandemic H1N1 2009 in New Zealand produced an epidemic curve similar in shape

Figure 1. Distribution of the age of patients with severe influenza during the first epidemics and during the first post-pandemic seasonal activity caused by pandemic H1N1 2009.

to the first wave, of about half to two-thirds the size, and starting 1 month later in the winter. In contrast to this report, our experience in Okinawa has shown the incidence of influenza mainly caused by pandemic H1N1 2009 virus increased markedly in August 2009, peaked in mid-September, and then declined thereafter. In addition, the incidence of influenza increased again and peaked in December 2009, and, overall, the influenza epidemics lasted 26 weeks.

We also compared the clinical features of patients that required intubation during the first epidemics with those that were intubated during the first post-pandemic seasonal activity, namely patients with severe influenza infection. The most striking difference observed in patients with severe influenza during the first epidemics and the first post-pandemic seasonal activity was the difference in the age of the patients. As shown in Figure 1, patients with severe influenza seen during the first epidemics were significantly younger compared with patients with severe influenza observed during the first post-pandemic seasonal activity. As demonstrated in Figure 1, in the first epidemics, younger children were more likely to deteriorate and require intubation mainly because of influenza encephalopathy as reported previously.^{7,8} In addition, three of 21 intubated patients died during the first epidemics. The age distribution of severe influenza observed during the first epidemics had the highest rates in children under the age of 10 years, and intubation rates declined significantly for most age groups (Figure 1). Among the 21 patients with severe influenza, only eight patients had underlying diseases (two had only bronchial asthma). In addition, four children had complications with bronchial asthma during the first epidemics.

In contrast, during the first post-pandemic seasonal activity, the status of patients with increased age deteriorated, and seven of 16 intubated patients died. The age distribution of severe influenza infection during the first post-pandemic seasonal activity was highest in adult patients aged 50–59 years, as well as adult patients aged 70–79 (Figure 1). In addition, among the 16 patients with

severe influenza infections, 15 patients had underlying diseases (one had only bronchial asthma and another had only obesity).

In conclusion, there were significant differences observed in the clinical features of critically ill patients observed in Okinawa, Japan, during the first epidemics and the first post-pandemic seasonal activity. Further study will be required to clarify the pathogenesis of severe influenza.

Conflicts of interest

The authors have no conflicts of interest to declare.

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