

LETTER TO THE EDITOR

Unexplained Increased Incidence of Legionnaires Disease during the “Herald Wave” of the H1N1 Influenza Pandemic

To the Editor—Our hospital, as well as others, was at the epicenter of the H1N1 (“swine”) influenza pandemic in the spring and summer of 2009 in the New York City area.^{1,2} The emergency department was inundated with hundreds of patients with influenza-like illnesses (ILIs) seeking H1N1 influenza (H1N1) testing and evaluation. Most of these patients were not sufficiently ill to require admission, but 25 adults were hospitalized with definite or probable H1N1 influenza pneumonia.

Positive results of rapid influenza A (QuickVue A/B) screening tests were highly predictive of positive reverse-transcription polymerase chain reaction (RT-PCR) results. However, in our emergency department, 30% of patients with an ILI and had negative rapid influenza diagnostic test results. Among the adult admitted patients with an ILI and negative rapid influenza diagnostic test results, there were major problems from diagnostic and infection control perspectives. The laboratory diagnosis of H1N1 influenza was based on the results of RT-PCR testing, which was restricted by the health department.^{3,4} In adults admitted with an ILI and negative rapid influenza diagnostic test results, clinical criteria were developed to enable clinicians to make a diagnosis of probable H1N1 influenza pneumonia.⁵

In the differential diagnosis of H1N1 influenza pneumonia in hospitalized adults, physicians had to exclude other disorders that mimicked H1N1 influenza pneumonia (eg, exacerbations of chronic bronchitis, asthma, and congestive heart failure). In the differential diagnosis, other important diagnostic considerations included neoplasms, pulmonary fibrosis, and community-acquired bacterial pneumonia.⁵ In the midst of the H1N1 influenza pandemic, we noted an unusual and otherwise unexplained increased incidence of Legionnaires disease.

We have been interested in and have tracked Legionnaires disease for decades. Traditionally, at our hospital, sporadic Legionnaires disease cases occur in late summer or early fall. In the summer months, during the “herald wave” of the H1N1 influenza pandemic, we noted an increased incidence of Legionnaires disease (ie, 9 cases). These cases occurred earlier than that in past years at our institution. There were no changes in environmental conditions (eg, construction or changes in water supply) to account for this shift in occurrence and greater number of cases than usual. We compared our Legionnaires disease experience in terms of number of cases and peak occurrence with that from the 2 previous years (2007–2008). Clearly, from June through August 2009, there

was an increased incidence of Legionnaires disease, and the incidence peaked earlier than usual (Figure).

H1N1 influenza virus is an influenza A virus variant comprising the genetic combination of 4 elements of swine influenza, human influenza, avian influenza, and Eurasian swine influenza viruses.^{1,2} Because the H1N1 influenza pandemic strain is new, we looked to previous influenza A ep-

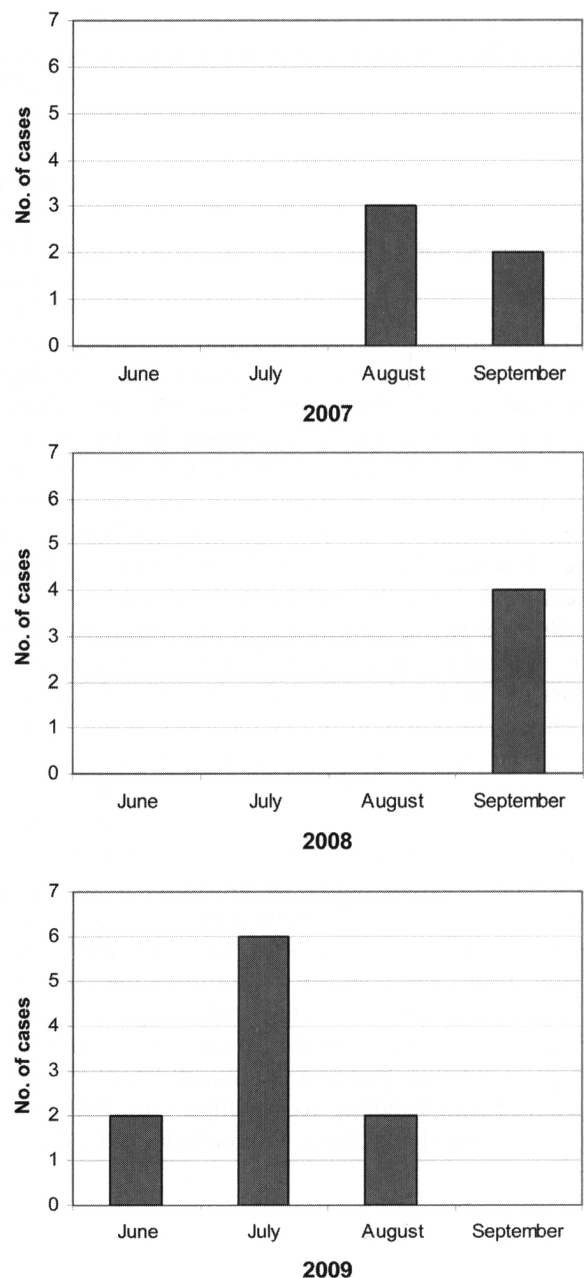


FIGURE Seasonal distribution of Legionnaires disease at Winthrop-University Hospital, Mineola, New York, 2007–2009.

idemics to determine whether other any infectious diseases were associated with previous influenza A pandemics. Because there were no environmental factors to explain this increased incidence and earlier peak in the incidence of Legionnaires disease, we searched the PubMed database for articles in English to determine whether the incidence of any infectious diseases increased during previous influenza A pandemics. Interestingly, during the influenza pandemic in 1957–1958, European authors and then American authors reported an unexpected and unexplained increase in acute appendicitis among patients with influenza A.^{6,7} The authors reported that not only was the incidence of acute appendicitis elevated during the influenza A pandemic, but also that cases of acute appendicitis were unusually severe. They had no explanation for the relationship between the influenza pandemic and the incidence and severity of acute appendicitis.^{6–8} Interestingly, during the H1N1 influenza pandemic at our institution, a case of acute appendicitis occurred in a young adult with H1N1 influenza.

Although we cannot explain the earlier-than-usual and unusual increased incidence of Legionnaires disease during the herald wave of the H1N1 influenza pandemic at our hospital, all 9 cases were due to *Legionella pneumophila* (serogroups 01–06) and were diagnosed by means of *Legionella* urinary antigen testing. We believe that there may be a relationship between H1N1 influenza pneumonia and Legionnaires disease. None of the 25 hospitalized adults with probable or definite H1N1 influenza pneumonia had concurrent community-acquired bacterial pneumonia (eg, Legionnaires disease). We have no pathophysiologic explanation for this apparent relationship. Both H1N1 influenza and Legionnaires disease affect lymphocytes, and both conditions are associated with relative lymphopenia. Perhaps the answer lies in the lymphocytes.^{8–10}

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