

# Severe Pneumonia and Respiratory Failure from Influenza A/H1N1 2009 Coinfected with *Streptococcus pneumoniae* Bacteremia in a Pregnant Woman

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## ABSTRACT

In 2009, pandemic influenza A/H1N1 2009 increased the risks of morbidity and mortality, especially in pregnant women. Center of Disease Control and Prevention (CDC) had reported that about 29 percent of the fatal cases from influenza A/H1N1 2009 infection also had bacterial coinfection, which nearly half of them were *Streptococcus pneumoniae*. We had successfully treated a 28-year-old woman with overlap syndrome who was sick from influenza A/H1N1 2009 pneumonia and *S. pneumoniae* bacteremia. She was pregnant with gestational age of 35 weeks. To our knowledge, there has never been any reported case of influenza A/H1N1 2009 coinfection with *S. pneumoniae* bacteremia in Thailand. (*J Infect Dis Antimicrob Agents* 2010;27:91-4.)

**Note:** This case had been presented and discussed in the Interhospital Case Conference on Infectious Diseases (ICCID), 26 March 2010, Bangkok, Thailand

## INTRODUCTION

On June 11, 2009, the World Health Organization (WHO) declared the pandemic outbreak of respiratory illness associated with the influenza A/H1N1 2009 virus.<sup>1</sup> The influenza A/H1N1 2009 infection can cause various degrees of infection, ranging from mild to severe to fatal. Evidence from previous influenza pandemics and interpandemic seasonal influenza

suggested that pregnant women were at increased risk for influenza complications.<sup>2</sup>

Influenza and *Streptococcus pneumoniae* (*S. pneumoniae*) are the leading infectious causes of death in the United States. Both pathogens had strong seasonal patterns, with illness rates peaking in winter. *In vitro* studies indicated that influenza infection predisposed to pneumococcal pneumonia, with greatest

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host susceptibility period was approximately 1 week after influenza infection.<sup>3</sup> We report a case of a 28-year-old pregnant woman with overlap syndrome who developed severe influenza A/H1N1 2009 pneumonia and *S. pneumoniae* bacteremia on the first day of hospitalization who eventually survived and was discharged from our hospital without any sequel.

### CASE REPORT

A 28 year-old Thai woman with overlap syndrome (active systemic lupus erythematosus with systemic scleroderma) was hospitalized at Rajavithi Hospital, Thailand on January 14, 2009. She was pregnant with gestational age of 35 weeks. The presenting symptoms were high grade fever and dyspnea with non productive cough for 1 day prior to admission. On admission, the patient was found to have a temperature of 38.3°C, respiratory rate of 30 per minute, pulse rate of 120 beat per minute, blood pressure of 140/90 mmHg and tachypnea. She had crepitations at both lungs. There were no localizing neurological or meningeal irritation signs. Her oxygen saturation was 96 percent while being on mask with bag and oxygen at 10 liters per minute.

Laboratory investigations were performed as the following. Complete blood count revealed a hematocrit of 40.6 percent, WBC of 6,400/mm<sup>3</sup> (N 54%, L 1%, M 7%, band forms 38%) and a platelet count of 194,000/mm<sup>3</sup>. Blood urea nitrogen and creatinine were 10 and 0.6 mg/dL, respectively. Sputum Gram's stain revealed no bacteria. Liver function test and electrolytes were normal. An electrocardiogram showed sinus tachycardia. Chest X-ray revealed patchy infiltration on both lungs (Figure 1).

The patient was hospitalized at an intensive care unit (ICU) and a throat swab was sent to test for influenza A/H1N1 2009, using polymerase chain reaction (PCR) technique and 2 sets of aerobic blood



**Figure 1. Chest X-ray on the admission day showed bilateral patchy infiltration of both lungs.**

cultures were sent to Microbiology Unit. The antibiotics chosen on the first day were cefoperazone/sulbactam, azithromycin and co-trimoxazole. Oseltamivir (75 mg twice daily) was started on the second day of hospitalization. She received dexamethasone 4 mg twice daily for treatment of overlap syndrome. On the fourth day of hospitalization, a report of PCR of throat swab showed a positive result for influenza A/H1N1 2009 and hemoculture showed positive for *S. pneumoniae*. Chest X-ray revealed an increased infiltration of the right and left lungs (Figure 2). She received an increased dose of oseltamivir to 150 mg twice daily and the antibiotics were changed to ceftriaxone. On the fifth day of hospitalization, the patient was intubated with ventilation support due to acute respiratory failure. Cesarean section was performed due to fetal distress and maternal hypoxia. A premature female infant was born with birth weight of 1,910 g and Apgar score of 7, 8. Infant was admitted to the neonatal ICU, primarily for management of complication of prematurity. Finally, infant survived with no evidence of influenza or *S. pneumoniae* infection. On the sixth day of hospitalization, fever decreased and



**Figure 2. Chest X-ray on the fourth day showed an increased infiltration of both lungs.**



**Figure 3. Chest X-ray on the sixth day showed marked decreased of infiltration of both lungs.**

chest X-ray revealed decreased infiltration of both lungs. On the twelfth day of hospitalization, she was extubated and was able to breathe spontaneously with oxygen mask and bag at 10 liters per minute. She had a respiratory rate of 22-24 per minute and an oxygen saturation of 96-99 percent. She received oseltamivir for 10 days and ceftriaxone for 14 days. On the twenty-

first day of hospitalization, she was able to breathe with room air and had an oxygen saturation of 96-98 percent. Finally, she was discharged from the hospital.

## DISCUSSION

The patient had severe community-acquired pneumonia caused by H1N1 influenza. In addition, she also had *S. pneumoniae* bacteremia. Although pneumococcal bacteremia is usually secondary to pneumonia, there is no evidence of pneumococci by sputum Gram stain or culture in this case.

Most bacterial infection occurs during influenza infection are pneumonia. Classically, bacterial pneumonia complicates influenza infection, occurs between 4 to 14 days after near resolution of influenza symptoms and presents with fever, dyspnea, productive cough, and abnormal chest radiographic findings.<sup>4</sup> Postmortem lung specimens of 77 fatal influenza A/H1N1 2009 infection cases were evaluated by the CDC to determine the role of bacterial coinfection in fatal outcomes. Evidence of bacterial coinfection was discovered in 22 (29%) cases by means of histopathologic, molecular and immunohistochemical analyses. In these 22 cases, *S. pneumoniae* predominated (10 cases), but these were postmortem findings.<sup>5</sup> Our case was proven by the evidence of *S. pneumoniae* bacteremia recovered from hemoculture results.

Even though our patient received steroid for controlling overlap syndrome with the concern about uncontrollable bacterial infection, she still had a full recovery from *S. pneumoniae* and influenza A/H1N1 2009 infection infections. These may be from the early administration of oseltamivir within 48 hours of developed symptoms. Compared to pregnant women who received treatment after 48 hours of infections, it increased the risk of admission to the ICU or death. That was about 4 times greater than those with earlier

treatment.<sup>6</sup> Our case was the first reported case of *S. pneumoniae* bacteremia coinfection with influenza A/H1N1 2009 infection in Thailand, who completely recovered from early treatment with oseltamivir and antimicrobial agents.

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