

# A rare case of dengue and H1N1 co-infection: A deadly duo

Sir,

In tropical countries, multiple infectious diseases are prevalent within the population at the same time. There exists a strong possibility for an individual to be affected by two or more organisms. We describe a case of concomitant infection with dengue and influenza–SOIV H1N1 (H1N1) and discuss the clinic-lab picture and the problems associated with the successful management of the case.

A 27-year-old male presented with moderate grade fever with headache, myalgia of 4 days; dry cough, running nose, sore throat and progressively increasing breathlessness of 1 day duration. He had blood pressure (BP) of 90/52 mmHg; pulse of 112/min; respiratory rate (RR) of 20/min,  $\text{spO}_2$  of 92% on room air with examination of respiratory and other systems being normal. His investigations showed hemoglobin (Hb) of 15.6 gm/dL, leucocyte count (TLC)  $2200/\text{mm}^3$ , platelets  $90,000/\text{mm}^3$  and hematocrit 43%. His other biochemical and laboratory profile were normal. His NS1 and IgM dengue ELISA was positive and real-time polymerase chain reaction (RT PCR), done later, was also positive for dengue (DEN1 serotype). His x ray chest (CXR) showed mild left pleural effusion. He was managed as a case of severe dengue (dengue shock syndrome) using oral and intravenous (IV) fluids, antipyretics and other supportive therapy.

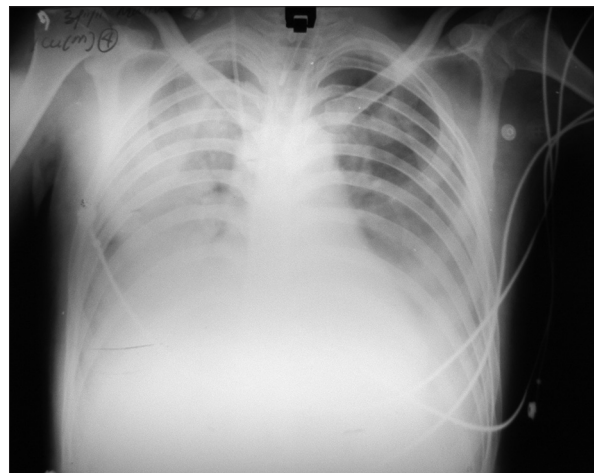
His cough and breathlessness worsened with tachypnea,  $\text{spO}_2$  88% and left interscapular crackles. His arterial blood gas analysis (ABG) showed pH of 7.40,  $\text{pCO}_2$  31 mmHg,  $\text{pO}_2$  62 mmHg, and bicarbonate of 16 mmol/L,  $\text{PaO}_2/\text{FiO}_2$  310 and a repeat CXR showing interstitial shadows in the left lower zone. He was given CVP-guided fluids, oxygen (4 L/min), IV ceftriaxone and levofloxacin, and other therapy continued. In view of upper respiratory tract (URT) symptoms with an interstitial pneumonia like picture, H1N1 pneumonia was also considered. His nasopharyngeal swab-antigen assay and RT PCR for H1N1 were positive. He was isolated and started on oral oseltamivir 150 mg twice daily. By second day, he progressively deteriorated with diffuse crackles up to mid interscapular level and worsening of opacities on CXR. He was intubated and placed on ventilator support (low tidal ventilation of 6 mL/kg and plateau pressure of 26-30 cm of water,  $\text{FiO}_2$  less than 0.6 and PEEP <10 cm of water).

Three days later, he showed signs of pneumonia (with CXR showing bilateral diffuse infiltrates as shown in Figure 1 and tracheal aspirate growing pseudomonas sensitive only to meropenem) with features of sepsis and multiorgan dysfunction, which was aggressively managed with IV

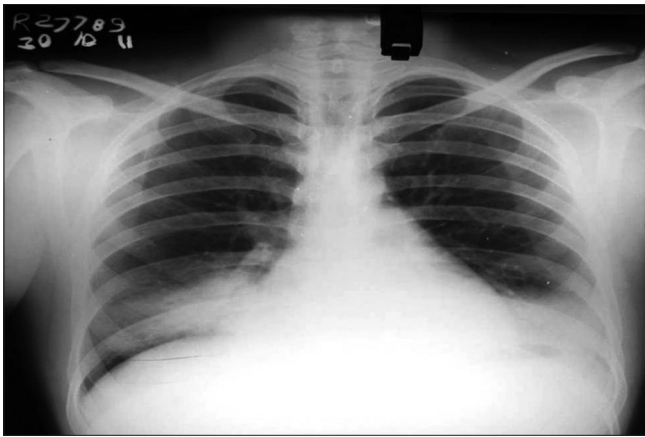
meropenem and other measures. Gradually by 7<sup>th</sup> day, the patient's ventilator parameters and laboratory parameters showed improvement. The weaning process was started and the patient was extubated by 12<sup>th</sup> day. With good physiotherapy and supportive measures, he was off all respiratory support by 14<sup>th</sup> day [Figure 2] and subsequently discharged on 20<sup>th</sup> day.

In tropical countries where peak dengue season often coincides with that of influenza; co-infections of dengue with influenza may be seen. Such cases are very rare and have been reported by Perez, *et al.*<sup>[1]</sup> and by Borthakur, *et al.*<sup>[2]</sup> The H1N1 virus is known to cause damage to respiratory epithelium. As the respiratory epithelium may also be afflicted by dengue virus, a mixed infection may lead to fulminant lung involvement.<sup>[3]</sup> On the contrary, some researchers postulate that dengue may improve outcomes in influenza by causing apoptosis of infected respiratory cells, thereby limiting spread of H1N1 infection.

The clinical syndrome produced by these infections can be mimicked by each other. Dengue may cause pulmonary features like parenchymal infiltrates, pleural effusion, pneumonitis, pulmonary hemorrhage and acute respiratory failure.<sup>[4]</sup> Influenza may cause a febrile illness with headache, myalgias, hemorrhagic manifestations, leucopenia or thrombocytopenia resembling dengue infection.<sup>[5]</sup> In such a scenario of mixed clinical picture, dengue can be confirmed by NS1, IgM, and IgG ELISA test which are sensitive, quick and simple; and H1N1 may be diagnosed by rapid antigen detection assays or RT PCR as shown in Table 1.



**Figure 1:** Chest x ray picture on day 5 of illness showing bilateral parenchymal infiltrates with bilateral pleural effusion



**Figure 2:** Chest x ray picture on day 16 of illness showing improvement in radiological picture

**Table 1: Common diagnostic tests of dengue and H1N1**

Diagnostic tests of dengue	Diagnostic tests of H1N1
Serology (NS1, IgM, IgG dengue)	Virus isolation and culture (gold standard)
ELISA	Antigen detection kits (rapid assay)
Hemagglutination inhibition	Hemagglutination inhibition test
Complement fixation test and	Immunofluorescence assay
Viral isolation and culture	Molecular test
RT PCR	RT PCR
	Virus genome sequencing

RT PCR: reverse transcriptase-polymerase chain reaction

Distinguishing dengue and influenza by clinical features alone can be difficult but certain clinical clues can help in diagnosis. Cough, sore throat, and other URT symptoms are common in H1N1 while headache, myalgias, arthralgias and hemorrhagic manifestations are commoner in dengue. A dengue patient may also have hemoconcentration (high Hb and PCV), leucopenia or thrombocytopenia, hypoalbuminemia, mild transaminitis, or mild ascites and acalculous cholecystitis. The diagnosis can be confirmed by serology.<sup>[6]</sup>

The management of such a co-infection needs aggressive treatment of both as discussed in this case which includes

appropriate fluid hydration, antipyretics, oseltamivir for H1N1, antibiotic therapy for secondary bacterial infection, oxygen support and aggressive critical care support. Both dengue and H1N1 influenza are potentially fatal diseases and a high index of suspicion is necessary among the treating physicians for early diagnosis and best outcomes.

**Vineet Behera, Nardeep Naithani, Asif Nizami,  
Rajeev Ranjan**

*Department of Internal Medicine, Armed Forces Medical College,  
Pune, Maharashtra, India  
E-mail: beheravineet@gmail.com*

**REFERENCES**

1. Perez MA, Gordon A, Sanchez F, Narvaez F, Gutierrez G, Ortega O, et al. Severe coinfections of dengue and pandemic influenza A H1N1 viruses. *Pediatr Infect Dis J* 2010;29:1052-5.
2. Borthakur B, Panwar D, Garg R, Pawar M. Viral co-infection with dengue and H1N1 virus in a critical care setting. *J Anaesthesiol Clin Pharmacol* 2011;27:236-8.
3. Lee YR, Su CY, Chow NH, Lai WW, Lei HY, Chang CL, et al. Dengue viruses can infect human primary lung epithelia as well as lung carcinoma cells, and can also induce the secretion of IL-6 and RANTES. *Virus Res* 2007;126:216-25.
4. Gupta KB, Parkash P, Kumar V, Yadav S. Pulmonary complications of dengue - A case report and review of literature. *Pulmon* 2009;11:15-8.
5. Chudasama RK, Patel UV, Verma PB, Amin CD, Savaria D, Ninama R, et al. Clinico-epidemiological features of the hospitalized patients with 2009 pandemic influenza A (H1N1) virus infection in Saurashtra region, India (September, 2009 to February, 2010). *Lung India* 2011;28:11-6.
6. Nair V, Behera V, Kapoor R. Dengue. In: Nair V (editor). *Textbook of Environmental Medicine*, 2<sup>nd</sup> Ed. India. Wolters Kluwers; 2014. chapter 6.6. p. 184-91.

Access this article online	
<b>Quick Response Code:</b> 	<b>Website:</b> <a href="http://www.lungindia.com">www.lungindia.com</a>
	<b>DOI:</b> 10.4103/0970-2113.156263