In a recent issue of *Critical Care*, Kuster and colleagues reported an observational study of patients admitted to critical care during periods of high influenza activity. A diagnosis of respiratory infection and being febrile (>38°C) were predictive of influenza among 126 confirmed subjects and had a higher predictive value for pandemic 2009 influenza A H1N1 (pH1N1) than seasonal influenza. A previous study identified that obesity, pregnancy, asthma, cardiac disease, immunosuppression, and diabetes are all risk factors for pH1N1 [2]. Such findings are important for focusing early optimal empiric therapy in addition to infection control measures during peaks of influenza activity. Nevertheless, it is important to investigate alternative differential diagnoses and pursue a definitive microbiological diagnosis when possible, particularly as bacterial co-infection occurs in almost a fifth of pH1N1 respiratory infections [3].

During the first 3 weeks of the 2010/2011 influenza season, 17 patients were admitted with proven influenza infection to critical care in our institution. A 28-year-old previously fit man presented at the end of this period with a 5-day history of dyspnea and cough. The patient was orientated, febrile (38°C), hypoxic with an arterial oxygen saturation (SaO₂) of 88% to 90% on high-flow oxygen, and tachypnoeic. He was intubated within 3 hours of hospital admission for severe hypoxic respiratory failure. His leukocyte count was 12 × 10⁹/L, and his C-reactive protein level was elevated (355 mg/L). A chest radiograph on admission demonstrated four quadrant infiltrates (Figure 1). Microbiological samples included a throat swab and non-directed bronchoalveolar lavage (NBL) for respiratory viruses and blood for serology. Guideline-concordant antibiotics for community-acquired pneumonia (co-amoxiclav and clarithromycin) were initiated [4]. Oseltamivir was also administered as the clinical presentation was typical of critically ill patients admitted in the previous 3 weeks with confirmed influenza.

The NBL and throat swab did not confirm influenza by reverse transcription-polymerase chain reaction. In the context of the 2010/2011 influenza season and the high index of clinical suspicion, it was assumed that these results represented a false negative [5] and oseltamivir was continued for 10 days. The patient required mechanical ventilation for 5 days. All other antimicrobials were discontinued after 7 days as the patient had improved, and he was discharged home on day 9. Subsequently, serology for influenza became available and was negative but did confirm a diagnosis of *Mycoplasma pneumoniae* infection, for which the patient had received appropriate therapy.

Pattern recognition of symptoms and signs is a fundamental aspect of how clinicians formulate a diagnosis.
Identifying features associated with a disease entity is an important aspect of improving this process but requires support from appropriate diagnostic tests that confirm or refute a diagnosis. The case described appeared typical of influenza infection during a period of intense influenza activity, but the serological results for *Mycoplasma* illustrate the importance of confirmatory diagnostic testing.

**Authors’ response**

Stefan P Kuster and Allison McGeer

We thank Holmes and colleagues for their interest in our article. We agree that the consideration of various differential diagnoses is a critical priority for clinicians, particularly those working in intensive care units (ICUs). As the case of Holmes and colleagues demonstrates, there is good evidence that ‘no specific symptom or combination of symptoms is diagnostic of [influenza]’ [6]; in addition, a significant proportion of community-acquired pneumonia episodes requiring ICU care are polymicrobial [7].

The aim of our study was not to find symptom complexes that were diagnostic of influenza – a quixotic quest – but rather to identify populations in whom the probability of influenza was high enough that influenza testing, empiric antiviral therapy, or empiric infection control precautions (or a combination of these measures) was warranted [1].

The results of our study are intended to sensitize clinicians to ordering influenza testing in addition to – not instead of – other diagnostic procedures.

**Abbreviations**

ICU, intensive care unit; NBL, non-directed bronchoalveolar lavage; pH1N1, pandemic 2009 influenza A H1N1.

**Competing interests**

The authors declare that they have no competing interests.

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