DISCORDANT CHEST RADIOGRAPHS—A PITFALL IN FEBRILE ELDERLY PATIENTS WITH PNEUMONIA

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SUMMARY

A 77-year-old female presented to our emergency department (ED) with sudden onset of fever and general malaise for a week. She was initially seen by her family physician a few days prior to ED admission. She reported no respiratory tract symptoms. Both primary care and ED physicians ordered chest X-rays to check for atypical presentation of pneumonia; both chest X-rays were negative for pneumonia. An abdominal computed tomography (CT) scan was ordered after abdominal ultrasound screening with suspected liver abscess during her ED stay. Surprisingly, the CT scan revealed right lung parenchyma infiltrates rather than liver abscess. The chest radiograph remains the gold standard for diagnosing pneumonia, but clinicians should be aware that chest radiography does not provide 100% reliable pneumonia diagnosis, especially in elderly patients. Physicians may need to consider the CT scan, not for routine use but as an alternative tool for making the diagnosis if no clear source of fever is found. [International Journal of Gerontology 2009; 3(3): 185–187]

Key Words: chest X-rays, computed tomography, pneumonia

Introduction

Pneumonia is a very common diagnosis in emergency departments (EDs), and is the most frequent cause of ED admission in the United States1. In older age groups, pneumonia may present differently because of biologic changes with age affecting host defenses and infection responses. This is commonly an issue for respiratory symptoms, such as cough and dyspnea; they are less frequently observed in elderly patients2. Chest radiograph (CXR) is frequently used for pneumonia diagnosis in EDs. Here, we report on a febrile elderly female patient whose initial work-up for fever included a negative CXR, but the final source of infection was proven to be pneumonia.

Case Report

A 77-year-old female reported general malaise and dizziness for several days. She was initially evaluated by her family physician with a physical examination and laboratory studies. This included white blood cell count and chest X-ray (Figure 1), the results of which were all normal. Three days after this, she developed fever with an extremely poor appetite, muscle ache, and near syncopal events; she was then brought to the ED. Upon arrival, her vital signs were stable except a body temperature of 39.6°C. The physical examination was unremarkable. She did not report any respiratory symptoms. Her past medical history included hypertension and hyperlipidemia. The initial ED workup for the patient included complete blood count (showing mildly elevated white count of 9,100/μL, without bandemia), biochemistry results, liver function profile, and urinalysis (all within normal ranges). Repeated CXR (Figure 2) was conducted in the ED and interpreted by both a radiologist and ED physician as negative for pneumonia. She was kept in an observation unit, because she continued to have spike fever. Her white blood cell count was
followed up and it raised slightly from 9,100/\mu L to 12,200/\mu L over a 12-hour period. We reviewed the patient’s history again in detail and repeated the physical examinations; her abdominal examination was significant for mild tympanic sound on percussion. An abdominal ultrasound was then ordered and liver abscess was suspected. So, an abdominal computed tomography (CT) scan was ordered, and the results surprisingly revealed right lower lobe infiltrates rather than liver abscess (Figure 3). The patient was then admitted to a medical ward with diagnosis of pneumonia.

Discussion

On reviewing the case, ED physicians initially ruled out pneumonia because of the patient’s two negative CXRs, supported by lack of respiratory symptoms and normal thoracic physical examination. Both ED and primary care physicians were aware of atypical presentation of pneumonia in elderly patients (who may present uncommonly with nonspecific complaints but respiratory problems). Others may argue that primary care or ED physicians are less accurate at interpretation of CXRs than radiologists, as shown in a recent study by Al Aseri\(^2\). However, the radiologist’s official reports (after two CXRs) in this case were consistent with the interpretation by the primary and ED physicians.

CXR is an effective, inexpensive and fairly quick study for diagnosing pneumonia. However, it has a few limitations. The classic radiographic features may be absent in the elderly patients, because coexisting diseases, such as congestive heart failure or chronic obstructive pulmonary disease, may obscure the presence of an infiltrate. The radiographic manifestations of pneumonia in the elderly may be difficult to interpret. Research has suggested that pneumonia may not appear on chest films when in a dehydrated state\(^4\).

Although CXR is still considered the standard of care for diagnosing pneumonia, it does not have 100% sensitivity or 100% specificity. Basi et al.\(^5\) reported that...
one-third of admitted patients were found to have a normal CXR on admission, and these patients had lower respiratory tract infections with positive blood and sputum cultures. Syrjala et al.6 studied patients with clinical findings consistent with pneumonia but without a diagnostic CXR. They found that 26% of patients had abnormalities consistent with the diagnosis of pneumonia on high-resolution chest CT. In several studies, CT scans were superior to the traditional CXR for diagnosing pneumonia in populations of immunocompetent children, neutropenic patients, and patients with human immunodeficiency virus7–9. Although chest CT is not suggested for routine use in pneumonia patients, it may be useful in certain settings.

The patient in this case report presents an interesting example of two back-to-back CXRs being discordant with pneumonia, and presenting symptoms that were not directly affecting the respiratory system. The patient’s extreme age and fever are a warning for physicians, in that no single symptom, sign or examination finding is statistically powerful enough to rule in or out the diagnosis of pneumonia on CXR10.

References