

Case Report

**LEGIONNAIRE PNEUMONIA PRESENTING WITH HALLUCINATIONS,
SLURRED SPEECH PANCYTOPENIA, TRANSAMINITIS AND
ELEVATED CREATININE IN AN IMMUNOCOMPETENT
INDIVIDUAL: A CASE REPORT**

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ABSTRACT

A 46 year old Jamaican man was seen in the ED with a history of subjective fever and productive cough, followed by confusion, hallucinations and slurred speech. His examination revealed decreased breath sounds over the left chest and rhonchi were present. Labs revealed neutropenia, hyponatremia, transaminitis, increased creatinine. X ray revealed large left-sided opacity and CT scan revealed extensive, dense consolidation with nicely demonstrated air-bronchograms. The combination of clinical, radiographic, and laboratory parameters made legionnaire's disease the most likely diagnosis in our case. In fact, this patient's urine legionella antigen assay was positive, and he recovered following a course of appropriate antibiotics.

Keywords: Legionnaire Pneumonia

CASE

A 46-year-old local truck driver originally from Jamaica, West Indies was brought to the emergency department (ED) of an urban U.S. hospital by his wife for 5 days of subjective fever and productive cough followed subsequently by confusion, hallucinations and slurred speech. Although, he had been losing weight even prior to the acute illness, his oral intake became especially poor after the onset of these symptoms. No complaint of dyspnea or diarrhea was elicited, and the remainder of the review of systems was negative. The patient was a 10-pack-year current smoker and an occasional drinker of alcohol. There was no recent history of distant travel or occupational exposures.

In the ED, the patient was found to be normotensive with a temperature of 102.7F, a pulse of 115, a respiratory rate of 19, and an oxygen saturation of 100% on non-invasive positive pressure ventilation, which was eventually discontinued. The patient was disoriented. He received intravenous fluids, ceftriaxone, azithromycin, and vancomycin. Lumbar puncture was performed by the ED staff. Upon evaluation by the admitting medical team, the patient was awake and alert but remained disoriented; his respirations were unlabored. The patient appeared chronically ill. There was temporal wasting but no nuchal rigidity. He had no JVD, and his sclerae were anicteric. There was no oral thrush. Cardiac exam revealed regular rate and rhythm without murmurs. On lung auscultation, breath sounds were diminished over the left chest and were rhoncherous in character. The abdomen was tense to palpation but non-tender and without guarding. He had normoactive bowel sounds. There was no clubbing or edema. Neurological exam was non-focal. Complete blood count was significant for pancytopenia. Serum chemistry revealed a low Na level of 132 meq/L and an elevated creatinine level of 3.3 mg/dL. There was a transaminitis: AST 242 U/L and ALT 124 U/L. Total bilirubin was elevated at 5.1 mg/dL, but the alkaline phosphatase and GGT were normal. LDH was markedly elevated. Coagulation parameters were normal. Rapid testing for HIV infection was negative. Urinalysis was significant for a large amount of blood without proteinuria or casts. The LP yielded 1 leukocyte, and the rest of the results were unremarkable. The patient was admitted to the step-down unit, where intravenous fluids and antibiotics were continued. Review of the peripheral

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blood smear revealed no schistocytes. Blood and urine cultures were ultimately negative. His urine legionella antigen assay was positive.

A chest radiograph was performed (Figure 1) followed by a CT scan of the thorax (Figure 2). The chest radiograph revealed a large left-sided opacity located predominantly within the left upper lobe. No prior radiographs were available for comparison. The subsequent chest CT confirmed the x-ray opacity to be an extensive, dense consolidation with nicely demonstrated air-bronchograms (arrow). The combination of clinical, radiographic, and laboratory parameters made legionnaire's disease the most likely as can be seen in the above description and he recovered following a course of antibiotics.

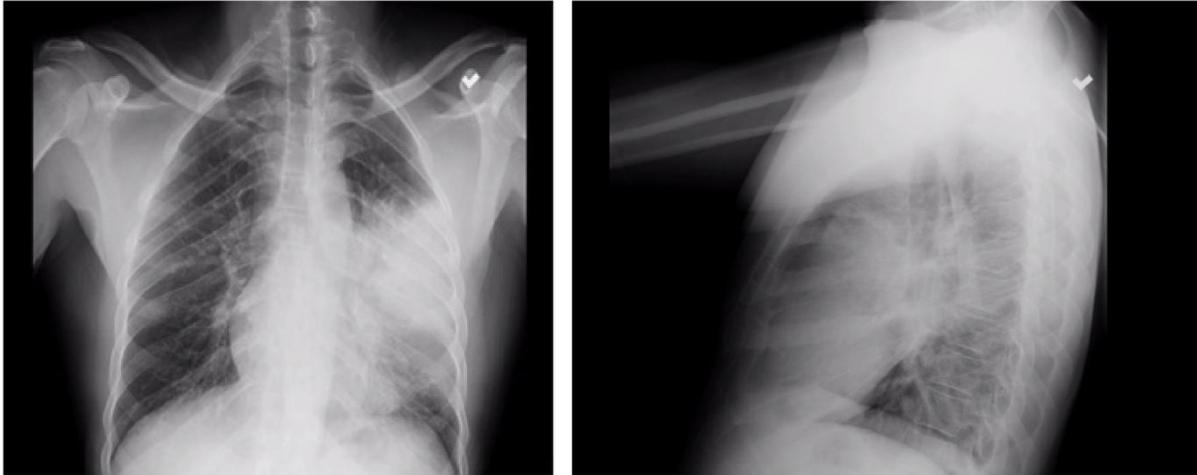


Figure 1(a, b): Large Left-Sided Opacity Located Predominantly within the Left Upper Lobe

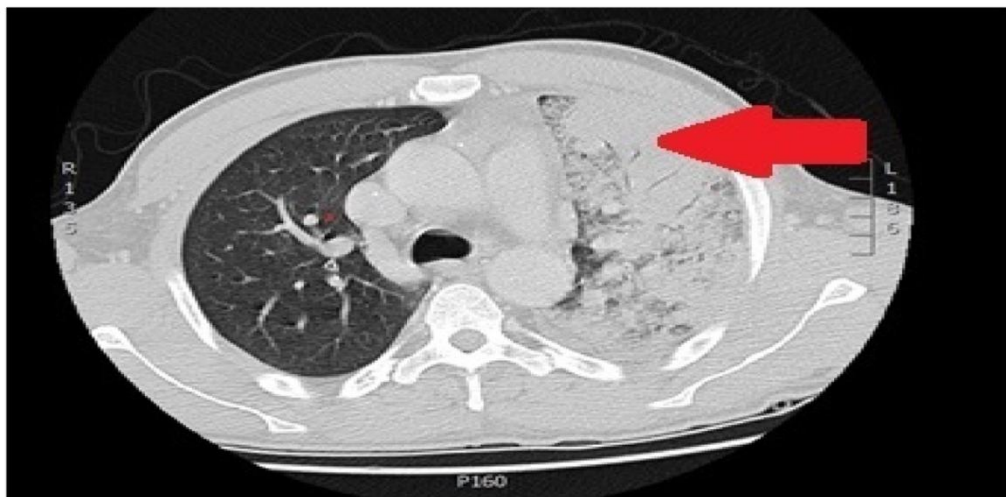


Figure 2: CT Scan Showing Extensive, Dense Consolidation with Nicely Demonstrated Air-Bronchograms (Arrow)

DISCUSSION

Legionella pneumophila earned this name after the gram-negative coccobacillus was associated with several outbreaks of severe respiratory illness, most famously during the American Legion convention in Philadelphia in 1976 (Cunha, 2010). There are many serotypes, but only 6 of them account for the majority of human disease. Legionella is difficult to isolate because it grows poorly on standard media; in the lung, it is an intracellular pathogen, and thus, impaired cellular immunity predisposes to infection (Cunha, 2010). Its natural habitat is fresh water, and contaminated water sources have caused nosocomial

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outbreaks. Legionnaire's disease refers to pneumonia caused by legionella species. Pontiac fever, so named for an outbreak in Pontiac, Michigan, is an acute febrile illness without lung involvement. Legionnaire's disease is a form of acute and severe CAP; the patient is usually admitted to the step-down or even intensive care unit. Its radiology is nonspecific, generally characterized by dense multi-lobar lung consolidation. Commonly, as is often the case in atypical pneumonia, the lung infection is accompanied by a constellation of extra-pulmonary manifestations that permit a presumptive diagnosis while awaiting laboratory confirmation. Many such features were observed in our case. Vital signs classically reveal pulse-temperature dissociation, meaning that the patient is relatively bradycardic despite a fever that should produce a higher pulse (Cunha, 2010). Headache and altered sensorium are both common, frequently leading to consideration of meningitis. Abdominal pain and diarrhea are typical presenting complaints. Associated laboratory findings include hyponatremia, transaminitis, and microscopic hematuria. Clinically suspected legionella pneumonia is most commonly confirmed in practice by an assay for antigenuria, which detects the 6 relevant serotypes and is not affected by antibiotic therapy (Helbig *et al.*, 2003).

This patient's relatively acute presentation with respiratory symptoms and focal lung consolidation points to a bacterial community-acquired pneumonia (CAP), which is most commonly caused by the so-called "typical" organisms such as streptococcus pneumoniae, haemophilus influenzae, moraxella catarhalis, and klebsiella pneumoniae. "Atypical" pneumonia is likewise in the differential diagnosis, which can be subdivided into zoonotic and non-zoonotic infections. The lack of exposure history to animals makes zoonotic entities like psittacosis, Q fever, and tularemia less likely. The accompanying neurological and laboratory abnormalities would be most consistent with an atypical but non-zoonotic pathogen in our case, namely *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*, or *Legionella pneumophila*. Adenovirus can also present similarly. The patient's apparent immunocompetence makes opportunistic pneumonia a remote consideration.

The acuity of his presentation, his long-standing residence in the northeastern United States, and his radiographic picture would have been unusual for mycobacterial organisms and other granulomatous infections, but his occupation as a truck driver compels one to consider reactivation of endemic fungal infections such as histoplasmosis and coccidiomycosis. Non-infectious entities also enter the differential diagnosis, especially should treatment with antimicrobials fail to improve the patient's condition. These can be divided into neoplastic and inflammatory phenomena. Lung adenocarcinoma, for example, is a well-known mimicker of pneumonia and is of particular concern in someone with a smoking history and evidence of recent weight loss. The same can be said of lymphoma. Non-neoplastic possibilities would include organizing pneumonia, vasculitis, and alveolar sarcoidosis among others. Radiographic findings are not specific enough to distinguish among typical and atypical pathogens in pneumonia nor to exclude any of the non-infectious considerations.

Therefore, blood and body fluid analysis is warranted in an attempt to arrive at a concrete diagnosis. Blood cultures will generally have already been drawn and can be helpful if the patient turns out to have bacteremic pneumonia. Blood can be sent for mycoplasma IgM and cold agglutinin titers as well as for zoonotic and fungal serologies. Sputum bacterial culture, though rarely contributory, may reveal an unsuspected organism. Sputum mycobacterial and fungal cultures can be obtained. The urine can be tested for pneumococcal and legionella antigens. Sputum cytology has a low yield in lung cancer not involving the airway but can be considered in the course of the evaluation. Ultimately, neoplastic and inflammatory conditions would require lung biopsy for diagnosis. Thus, for legionnaires disease based on local availability and expertise, the diagnostic evaluation include culture, direct fluorescence antibody, as well as comparison of acute and convalescent titers (Fiore *et al.*, 1999). Macrolides and fluoroquinolones are the two antibiotics used most commonly to treat legionella; thus, the vast majority of CAP regimens will include legionella coverage (Kuzman *et al.*, 1995; Yu *et al.*, 2004). Duration of therapy is a matter of physician preference, but courses often last as long as two weeks. There are no established data to suggest that combination therapy is more effective than monotherapy (Pedro-Botet *et al.*, 2006; Pedro-Botet and Yu, 2009). The morbidity associated with condition are respiratory failure and acute renal failure

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(Mykietiuk *et al.*, 2005). Recovery is expected when antibiotic treatment is prompt and appropriate (Heath *et al.*, 1996; Gacouin *et al.*, 2002).

Conclusion

This case report exemplifies the fact that the physicians must keep a low threshold of legionella pneumonia in a patient with pneumonia with associated hallucinations and relative bradycardia and empiric treatment should be initiated early that can significantly decrease morbidity associated with this condition.

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