

Introduction

Legionnaires' disease is seen in approximately 1.4 to 1.8 cases per 100,000 persons in the US (1). This condition should be considered in any patient presenting with community acquired or nosocomial pneumonia. The early recognition and treatment are crucial to improve outcomes and decrease mortality. We report a case of severe Legionellosis in a healthy young man, who had a complicated hospital course, and an initial false-negative *Legionella* urine antigen test.

Case presentation

A 34-year-old man was brought to the ER for high-grade fever, chills, diarrhea, non-productive cough, and progressive confusion for 4-days. Upon presentation, the patient was oriented only to self. Crackles were heard on the right upper lung field. The patient was normotensive, tachycardic (126 beats/min), tachypneic (23 breaths/min), had a SaO₂ of 93% on room air, and low-grade fever (100.5°F). Labs were significant for mild leukocytosis (WBC of 11.7 K/uL), thrombocytopenia (platelets of 101 K/uL), hyponatremia (sodium of 126 mEq/L), rhabdomyolysis (CPK of 96,000 U/L), coagulopathy (INR 1.7), elevated transaminases (ALT 168 U/L, AST 715 U/L), procalcitonin of 4.06 ng/ml, and creatinine of 1.2 mg/dl. The chest radiograph (Figure 1) and confirmatory CT chest showed consolidation in the right upper lobe. The CT of the head was normal. The urine antigen for legionella was negative. The patient was started on meropenem, vancomycin, and levofloxacin with aggressive IV hydration.

Due to the high suspicion for *Legionella* infection, a repeated urine antigen test was performed and was positive confirming *Legionella* pneumonia. Antibiotics were de-escalated to levofloxacin, however, rifampicin was added for severe sepsis syndrome and worsening respiratory status. The repeated chest X-ray revealed bilateral pulmonary congestion. Follow-up labs were significant for positive troponin of 0.123 ng/ml, and CPK of 130,000 U/L. Echocardiogram showed severely reduced left ventricular function (ejection fraction ~20%) and diffuse hypokinesia. The patient was started on lisinopril and carvedilol. The hospital course was complicated by ventricular tachycardia with subsequent fibrillation and cardiac arrest. ACLS protocol was applied and the patient was intubated. He remained stable, an AICD was placed, and the patient was eventually discharged to a subacute rehabilitation center.

Figure 1



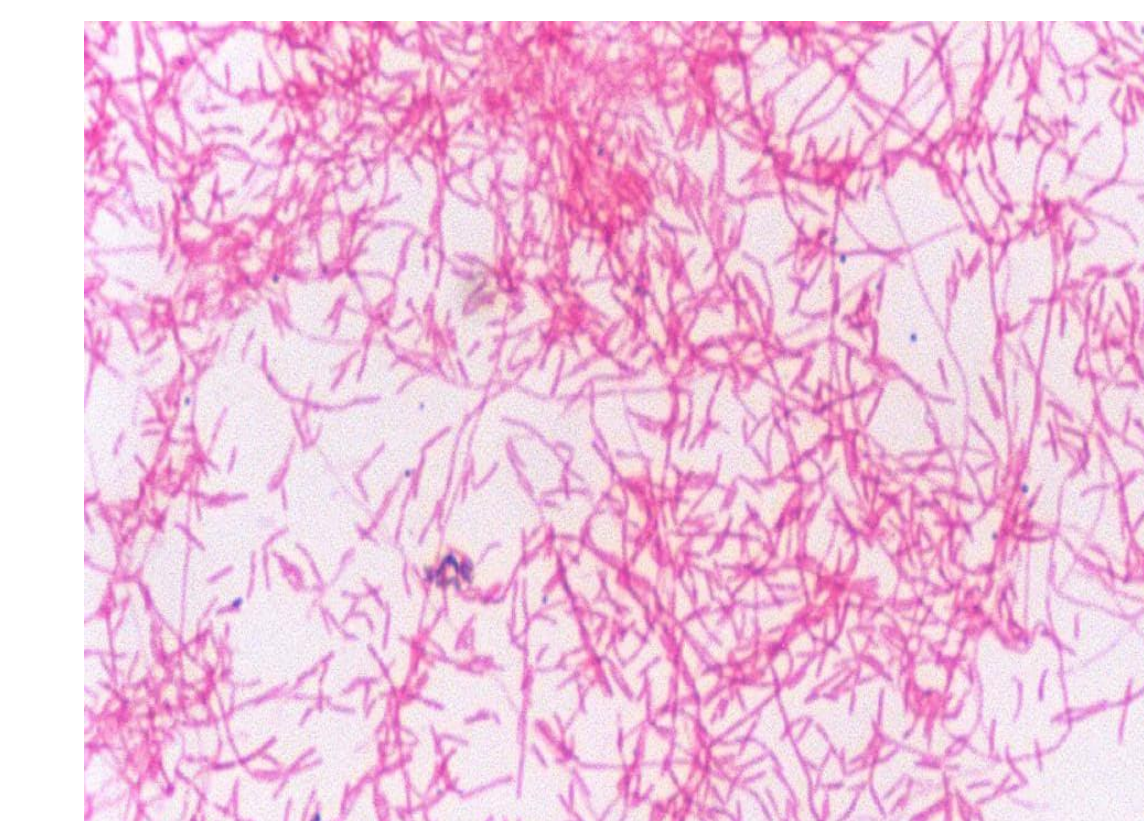
Chest X-ray showing right upper lobe consolidation.

Teaching Points

- *Legionella* bacteria are aerobic, gram-negative, intracellular pathogens that are commonly found in water and soil. Human infection is typically acquired through inhalation of aerosols from these substances (1).
- Legionellosis accounts for approximately 1 to 10 percent of cases of community-acquired pneumonia with mortality estimates range from approximately 1 to 10 percent (1).
- It's very important to recognize severe *Legionella* pneumonia infection with end-organ failure and to repeat *Legionella* urine antigen test when the initial result is negative in highly suspected cases.
- Levofloxacin and azithromycin are the preferred agents for the treatment of Legionnaires' disease (4).

Discussion

Legionella pneumophila is usually found in freshwater environments but can grow in any water system such as building cooling towers. From its source, *Legionella* is spread by airborne transmission through aerosolized water (2). Pneumonia caused by *Legionella* is clinically and radiographically similar to other forms of pneumonia (3). The main testing options for *Legionella* infection include nucleic acid detection, urine antigen, and culture. False-negative urine antigen for *Legionella* can be suspected in diluted samples, late testing (later than 7 days post-infection), and in cases of *Legionella pneumophila* non-serogroup 1 infection. Therefore, in strong suspicion for *Legionella* infection repeat testing is beneficial. Severe Legionellosis can lead to end-organ failure including rhabdomyolysis, kidney damage, hepatitis, and myocarditis causing heart failure. Levofloxacin and azithromycin are the preferred agents for the treatment of Legionnaires' disease (4).



Legionella bacteria seen under light microscopy.
Legionella bacteria are aerobic, gram-negative, intracellular pathogens.
Source: daily telegraph.com

References

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