Legionnaire's Disease and its Mimics: A Clinical Perspective

Burke A. Cunha, MD, MACP[a,b,*], Cheston B. Cunha, MD[c]

KEYWORDS

• Q fever • Psittacosis • Influenza like illnesses (ILIs) • Mimics • Adenovirus • HPIV-3

KEY POINTS

- Legionnaire's disease most often manifests as community acquired pneumonia (CAP) with characteristic extrapulmonary features that serve as diagnostic clues.
- Radiologically, legionnaire's disease presents as a rapidly progressive asymmetric multifocal pneumonia.
- For hospitalized adults with fever greater than 38.9°C (102°F), relative bradycardia is an important diagnostic finding in legionnaire's disease. Relative bradycardia also occurs with psittacosis and Q fever, but not with typical bacterial causes of CAP, such as *Streptococcus pneumoniae*, or nonzoonotic atypical pneumonias, such as *Mycoplasma pneumoniae* and *Chlamydophila pneumoniae*.
- Legionnaire's disease mimics are those CAPs that have otherwise unexplained clinical and or laboratory test findings in common with legionnaire's disease; for example, mental confusion, watery diarrhea, acute renal failure, highly increased C-reactive protein (CRP) level or erythrocyte sedimentation rate (ESR), microscopic hematuria, highly otherwise unexplained increased ferritin levels, mildly elevated serum transaminase levels, hypophosphatemia, or hyponatremia.
- Mycoplasma CAP is not usually considered a legionnaire's disease mimic. Except for watery diarrhea, mycoplasma pneumonia does not resemble legionnaire's disease radiographically. Furthermore, with *Mycoplasma* CAP, fevers are usually less than 38.9°C (102°F) (without relative bradycardia), and ESR, CRP, and ferritin levels are not highly increased. Serum transaminase levels are not increased and hypophosphatemia/hyponatremia are also not present. The presence of highly elevated cold agglutinin titers (>1:64) in hospitalized adults with CAP should suggest mycoplasma pneumonia and argues strongly against a diagnosis of legionnaire's disease.

Continued

[a] Infectious Disease Division, Winthrop-University Hospital, 222 Station Plaza North, #432, Mineola, NY 11501, USA; [b] School of Medicine, State University of New York, Stony Brook, NY, USA; [c] Division of Infectious Disease, Rhode Island Hospital, The Miriam Hospital, Brown University Alpert School of Medicine, Providence, RI, USA
* Corresponding author. Infectious Disease Division, Winthrop-University Hospital, 222 Station Plaza North, #432, Mineola, NY 11501.
E-mail address: bacunha@winthrop.org

Infect Dis Clin N Am 31 (2017) 95–109
http://dx.doi.org/10.1016/j.idc.2016.10.008 **id.theclinics.com**

Continued

- The most common bacterial mimics of legionnaire's disease are *S pneumoniae*, psittacosis, and Q fever.
- In hospitalized adults the most common viral mimics of legionnaire's disease are influenza, and viral pneumonias caused by influenzalike illness; for example, respiratory syncytial virus (RSV), rhinovirus/enterovirus (R/E), human metapneumovirus (hMPV), human parainfluenza virus type 3 (HPIV-3), and adenovirus.

CLINICAL DIAGNOSTIC APPROACH

If a disorder resembles another in one or more clinically important aspects, the potential for one disease masquerading or mimicking another is present. Unlike typical bacterial pneumonias, with clinical findings confined to the lungs, legionnaire's disease, a nonzoonotic atypical pneumonia, has several characteristic extrapulmonary findings. Pneumonias with one or more characteristic features of legionnaire's disease may mimic legionnaire's disease.[1–5] The more characteristics findings there are in common with legionnaire's disease, the more closely a pneumonia mimics legionnaire's disease (**Box 1**).

The characteristic clinical features of legionnaire's disease are not present in all cases.[1,3–5] Furthermore, individually, characteristic findings of legionnaire's disease are not diagnostic of legionnaire's disease. However, when characteristic findings of legionnaire's disease are otherwise unexplained and considered together, the probability of legionnaire's disease is greatly increased.[6] In contrast, clinical findings that are only

Box 1
Legionnaire's disease: characteristic clinical findings that increase pretest probability in hospitalized adults with pneumonia

Clinical findings[a]

- New onset of pneumonia symptoms
- Fever greater than 38.9°C (102°F) (with relative bradycardia)

Chest film features[a]

- New rapidly progressive unilateral or bilateral interstitial/nodular infiltrates
- New rapidly progressive bilateral multifocal infiltrates

Laboratory test abnormalities[a]

- Leukocytosis
- Relative lymphopenia
- Highly increased erythrocyte sedimentation rate (>90 mm/h) or highly increased C-reactive protein level (>180 mg/L)
- Highly increased ferritin levels (>2 × normal)
- Hypophosphatemia (on admission/early)
- Highly increased creatine phosphokinase level (>2 × normal)
- Microscopic hematuria (on admission)

[a] Otherwise unexplained.
Adapted from Cunha BA, Wu G, Raza M. Clinical diagnosis of legionnaire's disease: six characteristic criteria. Am J Med 2015;128:e21–2.