Legionella Pneumophilla Infection Masquerading as Acute Cholecystitis

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\textbf{ABSTRACT}

Legionella pneumophilla represents a relatively common cause of community acquired pneumonia with high mortality related burden if not promptly diagnosed and treated with appropriate antibiotics. Clinical characteristics of Legionella infection are often non-specific making accurate diagnosis challenging.

We report a case of a middle aged immunocompetent woman referred to our department via her general practitioner with a history of fever and abdominal pain located in the right upper abdominal quadrant. Initial diagnostic work up disclosed a moderate elevation of inflammation markers and cholelithiasis. The paucity of respiratory symptoms led initially to an altered presumed diagnosis of acute cholecystitis. Development of pulmonary symptoms during hospitalization raised the suspicion of Legionella community acquired pneumonia. The diagnosis was later confirmed by serology.

\textbf{Keywords:} Legionella, community acquired pneumonia, cholecystitis, diagnosis

\textbf{INTRODUCTION}

Legionella is a gram negative facultative bacterium, and a common cause of hospital as well as community acquired pneumonia in adults (1). Remarkably, Legionella community acquired pneumonia is of particular severity if not promptly diagnosed and treated, accompanied by a high mortality related burden that reaches up to 27 percent (2). However its diagnosis remains challenging due to the atypical clinical presentation and the common absence of pulmonary symptoms at onset (3). Here we present an atypical case of community acquired pneumonia presenting with right upper abdominal discomfort.

\textbf{CASE REPORT}

A 49 year-old smoker white Caucasian woman, was referred to the emergency department of our hospital with a two days history of fever and right upper quadrant abdominal pain. Her past medical history was unremarkable. In the emergency department
her vital signs were as follows: temperature 38.2°C, pulse rate 110 beats per minute, respiratory rate 15 breaths per minute, blood pressure 135/90 mmHg and oxygen saturation of 97% while breathing ambient air. Palpation of the abdomen disclosed marked sensitivity with tenderness in the right upper quadrant. Pulmonary auscultation did not reveal any abnormal finding. The rest of the physical examination was normal.

Chest X ray at admission was normal. Electrocardiogram revealed sinus tachycardia with no other abnormal findings. Initial laboratory work up disclosed: white blood cells, 13 cells / μl (normal range: 4-11 cells/μl) with 94% neutrophils, hemoglobin of 15.7 g/dL (range 14.0–18.0 g/dL), platelet count of 135 × 10³/mm³ (range 150–350 × 10³/mm³) sodium 136 mmol/L (normal range: 136-145 mmol/L), potassium 4.5 mmol/L (normal range: 3.5-5.1 mmol/L). Aspartate aminotransferase (AST) and alanine aminotransferase (ALT) were mildly elevated at 43 IU/L and 49 IU/L (normal range: 10-40 IU/L and 5-42 IU/L), respectively. Renal function tests were normal. Coagulation profile, amylase and lipase were all within normal limits. Measurement of inflammatory markers showed elevated levels of C-reactive protein (8.9 mg/dl). An ultrasound of the abdomen detected cholelithiasis along with signs of gallbladder inflammation (Figure 1). These findings were attributed to acute cholecystitis. Empirical antibiotherapy was initiated with intravenous (i.v) administration of ceftriaxone and teicoplanine. However, in the 5th hospital day the patient continued to be febrile and complained for pain irradiation to the right costophrenic angle. Respiratory auscultation revealed diminished breath sounds in the right lower lung fields while percussion showed dullness at the base of the right lung. Blood cultures were negative.

Computed tomography (CT) thoracic scan was consecutively performed indicating a large mass with a maximum diameter of 7 cm, irregular limits and necrotizing lesions inside, located in the right lower pulmonary lobe invading the pleura (Figure 2). A urine antigen test performed in the 6th hospital day confirmed the diagnosis and the antibiotic regimen was changed to moxifloxacin 400 mg daily i.v for two weeks. Taking a targeted social history, she reported frequent use of air-conditioner in her apartment. The patient was discharged 14 days after admission in a good condition. During his follow up, CT thoracic scan showed a full remission of the pathological findings (Figure 3).

DISCUSSION

Clinical characteristics of Legionella pneumonia vary from a mild infection to severe pneumonia that often requires admission to the intensive care unit (3). Non-specific systemic symptoms such as high grade fever, arthralgias or myalgia, headache, anorexia and confusion are usually present at onset (3). Furthermore, gastrointestinal symptoms develop frequently and include nausea, vomiting, abdominal pain and diarrhea (3). Typical respiratory symptoms that may develop in the course of the disease include dry cough, dyspnoea and less frequently pleuritic chest pain and he-
moptysis (3). In case of clinical aggravation, symptomatology reminds pneumonia with productive cough, dyspnea and pleuritic chest pain (4).

In regards to laboratory characteristics of legionellosis, liver and renal function test abnormalities, thrombocytopenia and leucocytosis are frequently present (3). Hyponatremia secondary to diarrhea and loss of water and sodium may also occur (5). The gold standard tool for the diagnosis of Legionella pneumophilla serogroup 1 infection is the urine antigen test since it is characterized by high sensitivity and specificity (of over 95 percent) (6) it is not influenced by antibiotherapy and remains positive for weeks after infection (3). For diagnostic confirmation of legionellosis acute and convalescent serology is useful to be tested. A fourfold increase in titres to 1:128 within 4 weeks is considered positive (3). Currently, the most efficient antibiotics are considered macrolides or fluoroquinolones (7). Intravenous administration of azithromycin is strongly suggested (3). In complex cases the later can be combined with a quinolone or rifampicin (3). Duration of antibiotherapy is 2 weeks in immunocompetent adults with extension to 3 weeks in immunocompromised hosts (3).

Prompt detection of Legionella infection and timely administration of appropriate antibiotherapy in the patient admitted to the acute care setting is of crucial importance (8). However, as in our case, early diagnosis is difficult since respiratory symptoms are lacking (3) and clinical manifestations are not reliable (8). This fact leads frequently to an alternate diagnosis and the appropriate antibiotherapy is delayed (3). In the same direction, clinical criteria proposed for the diagnosis of Legionellosis are of limited usefulness in the emergency care setting since they present low sensitivity and specificity of less than 80 percent (9). However, it has been reported that high grade fever, the presence of gastrointestinal symptoms that precede respiratory manifestations, hyponatremia and hepatic dysfunction are key clinical clues that have to trigger the diagnostic suspicion (3). In alignment, in a retrospective study that assessed the likelihood of Legionella community-acquired pneumonia in patients presenting to the emergency department were reported six parameters (high body temperature, absence of sputum production, low serum sodium concentrations, high levels of lactate dehydrogenase and C-reactive protein and low platelet counts) that could independently predict the accurate detections of patients with Legionella community acquired pneumonia (8). Additionally, lack of patient’s response to previous beta-lactamic antibiotics, severe hyponatremia, elevation of creatine cinase levels and absence of expectorative cough are important features in order physicians consider Legionella infection in their differential diagnosis (10).

In the case reported here, due to the absence of early respiratory symptoms, chest x-ray was overlooked and the diagnostic work-up was orientated towards imaging investigation of the abdomen. Therefore the non-specific systemic symptoms masked the accurate diagnosis in the emergency setting. Similarly, in a case series have been reported that patients systemic symptoms masked the accurate diagnosis in the emergency setting (3,11). More specifically they had received altered diagnoses such as acute cholecystitis and bacterial meningitis (3,11).

Emergency care physicians have to be aware and consider Legionella community acquired pneumonia in the differential diagnosis of right flank pain and fever even in the absence of respiratory symptoms. Awareness of the unreliable systemic clinical features of patients with legionellosis at onset in combination with a careful clinical examination as well as methodological appraisal of the laboratory findings may assist in timely diagnosis.
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REFERENCES