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CASE REPORT

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An Atypical Presentation of Legionnaire's Disease

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ABSTRACT

The multisystem involvement in Legionnaires' disease commonly includes the pulmonary, gastrointestinal tract, renal and neurological manifestations, but the mechanism of disease has not been defined except for the pulmonary system. Circulating toxins are the most likely culprit. We describe a nonfatal case of Legionnaires' disease that had seizures at presentation. The patient was a chronic alcoholic and a very remote history of seizures, the last seizure being 20 years ago. So at the time of presentation, we had to determine whether the seizure was due to withdrawal from substance abuse, was a regular tonic-clonic seizure that the patient was diagnosed with many years ago, or was it a manifestation of infection. An immunologic mechanism is mostly responsible for the extrapulmonary manifestations of Legionnaires' disease.

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Introduction

A species of Legionella bacteria, Legionella pneumophila, is quite often the cause of Legionnaires' disease [1]. In July 1976 people attending an American Legion convention in Philadelphia were affected with pneumonia caused by a previously unrecognized bacterium [2]. Twenty-nine of 182 cases were fatal [2]. It seemed that the spread is airborne, but no source was found. Legionella is a type of bacterium that is found naturally in freshwater environments. It can become a health concern when it grows and spreads in water systems like sink faucets, showerheads, hot tubs, plumbing systems. Home and car air-conditioning units that do not use water to cool the air, are not a risk for Legionella growth [3]. People can get Legionnaires' disease when they breathe in small droplets of water in the air that contains the bacteria [4]. The legionellaceae family has multiple species of which L. pneumophila is the commonest causative agent accounting for 90% of legionellosis cases [5].

Case Presentation

We hereby present a 56 year-old-man with a past medical history of seizures (last seizure 20 years ago), macrocytic anemia, and poly-substance abuse, presented to the ED with a witnessed seizure episode about 4 days ago. The seizure was witnessed by the patient's son and was described as tonic-clonic. The patient did not lose consciousness, was not confused, fully alert, and oriented, but felt very weak and lethargic after the seizure. The patient has not taken any seizure medications in many years. The last known seizure was 20 years ago. Examination revealed a thin man, sitting comfortably on the bed, not coughing, but speaking slowly. The patient has been drinking half a pint of hard liquor for many months. The last drink was one day before the presentation. On further questioning, the patient also complained of loose, non-bloody stools for a couple of days. Vitals on presentation were: blood pressure of 114/80 mm Hg, temperature 97.8 F, Pulse of 110, saturating 97% on room air. Liver function tests, thyroid studies, procalcitonin, lipid profile as in [Table 1].

Table 1: Liver Function Studies, Thyroid Function Studies, Procalcitonin

Laboratory Value	Patient's Value	Normal Range
Procalcitonin	7.18 ng/ml	0.00-0.05
TSH	5.32 mIU/L	0.47-4.68 mIU/L
Free T4	0.95 ng/dL	0.78-2.19 ng/dL
AST	93 U/L	17-59 U/L
ALT	41 U/L	4-50
Troponin I	< 0.012 ng/ml	0.00-0.034

Hemoglobin, hematocrit, white blood cells, creatinine on presentation as shown in [Table 2].

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Table 2: Laboratory Values on Presentation

Laboratory Value	Patient's Value	Normal Range
Procalcitonin	7.18 ng/ml	0.00-0.05
TSH	5.32 mIU/L	0.47-4.68 mIU/L
Free T4	0.95 ng/dL	0.78-2.19 ng/dL
AST	93 U/L	17-59 U/L
ALT	41 U/L	4-50
Troponin I	< 0.012 ng/ml	0.00-0.034

Chest x ray [figure 1] showed near complete opacification of the left hemithorax consistent with a large left-sided pleural effusion with underlying atelectasis and infiltrate. Right lung is clear. The x-ray looked worse than the patient clinically.

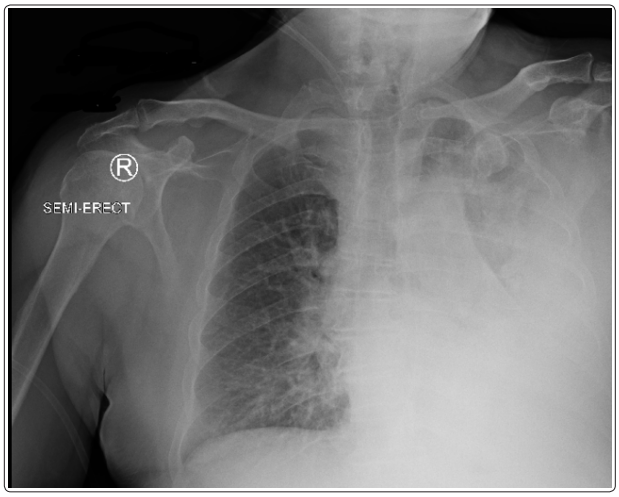

Figure 1: Chest X-ray: AP view of the chest demonstrating near complete opacification of the left hemithorax consistent with a large left-sided pleural effusion with underlying atelectasis and infiltrate. Right lung is clear

The patient's EKG showed Qtc prolongation at 479 ms. The patient was started on ceftriaxone and doxycycline. SARS-CoV-2 RNA (RT-PCR) was negative. Urine antigen for Legionella was sent which returned in a few days to be positive for Legionella. The patient's urine drug screen was positive for opiates and methadone. The alcohol level was normal. CIWA score at presentation was 2. The patient was alert and oriented. The banana bag was given, Ativan per needed, every four hourly for alcohol withdrawal and seizures, ordered. DVT prophylaxis with Lovenox sub Q 40 mg once daily and sequential compression device were ordered. The patient was placed on fall, aspiration, and seizure precaution. The patient's condition improved and was discharged with doxycycline for 10 days. The patient was counseled on cessation of the use of illicit drugs.

Case Discussion

The predominant symptoms of Legionella Pneumonia include fever, cough, and shortness of breath [6]. Symptoms usually arise 2-10 days after exposure to contaminated soil or water. Rales or signs of consolidation may be present [7]. Radiographic findings vary from patchy infiltrates to consolidation. Our patient had a chest x-ray positive for consolidation. Legionella infection should be considered in any patient presenting with pneumonia. While the majority of Legionella infections occur in patients with community-acquired pneumonia, it can also be acquired in health care settings. Outbreaks are often associated with contamination of water supplies or exposure to a contaminated water source eg, hot tubs. The constellation of findings of low sodium, CNS involvement in the form of seizures, and GI involvement in the form of diarrhea, made us start doxycycline early in the course of treatment. The typical presentation of Legionella Pneumonia includes gastrointestinal symptoms such as nausea, vomiting, diarrhea, hyponatremia, elevated hepatic transaminases, C-reactive protein levels > 100 mg/L.

Among our differential were aspiration pneumonia, community-acquired pneumonia. The upper lobe was involved which is not a typical presentation for aspiration pneumonia, but the patient was a chronic alcoholic so we added it to our differential. Community-acquired pneumonia was high in the differential because of consolidation on imaging studies and rales on examination. Legionella was high on the differential because of involvement of CNS (seizures), GI (diarrhea), hyponatremia. The best treatment options for Legionella include fluoroquinolone, macrolide, or tetracycline [8]. Selection among these agents and the need for treatment with additional antibiotics varies based on the severity of pneumonia, patient's comorbidities, and local resistance rate.

Conclusions

Legionnaires disease is a pneumonic illness with systemic manifestations. Although it primarily belongs to the pulmonary field, Legionnaire's disease sometimes displays some rare symptoms like seizures. The association of these rare symptoms with Legionnaire's disease may easily be overlooked. A urine antigen testing is mostly sufficient to assess the presence of Legionella. In patients presenting with neurological symptoms like seizures, altered mental status along with diarrhea, and laboratory abnormalities of hyponatremia, Legionella infection may be high on the differentials. Culture is considered the gold standard for diagnosis but takes longer. The most commonly used laboratory test is Legionella urinary antigen. Delay in diagnosis without the appropriate treatment can increase mortality. Empiric treatment for pneumonia should always include coverage for atypical organisms. If a patient is not improving with the current management, the diagnosis and the treatment plan should be re-evaluated.

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