

# The Challenges of Diagnosing Disseminated Lyme Disease in a Patient with CLL

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## ABSTRACT

The diagnosis of Lyme disease may be a challenge in patients with Chronic Lymphocytic Leukemia. In relying on detection of antibodies in the serum for diagnosis we are presented with a problem in our patients with CLL in whom there is hypogammaglobulinemia secondary to B-cell malfunction. We suggest the use of PCR in aiding in diagnosis of Lyme disease in patients with CLL.

**Keywords:** Chronic Lymphocytic Leukemia; Lyme Disease; Borrelia

## 1. Introduction

We present the case of a 53 y/o female with a history of CLL who was diagnosed with Lyme disease after several weeks of multifocal neurologic symptoms. The diagnosis was a challenge secondary to traditional serologic testing in patients with Lyme disease which relies on detection of antibodies in the serum. Our case proposes additional testing for suspicion of Lyme disease in a patient with CLL using PCR analysis.

## 2. Case

We report the case of a 53 year old female diagnosed with CLL in September of 2008 who presented to our hospital with multifocal neurologic symptoms which were present over several months.

The symptoms initially began with shoulder and back pain associated with neuropathic symptoms mainly dysesthesias. The patient presented to her PMD who treated the pain as musculoskeletal in etiology. She was administered a steroid injection and prescribed topical anesthetics and muscle relaxants which provided the patient with temporary relief. Later the patient began to feel a “band like” numbness around her abdomen and lower back region which persisted for a week. In addition, she developed an acute onset of facial droop which was evaluated at an outside hospital. This patient’s workup included an MRI/CT scan, and she was treated with Plavix for a suspected diagnosis of TIA.

A week following her diagnosis of TIA the patient returned with a sudden development of a right facial droop, difficulty with closure of the right eyelid, and increased

lacrimation of the right eye. The patient was worked up at an outside hospital and diagnosed with Bell’s Palsy. The patient was then referred to a neurologist who confirmed the diagnosis of Bell’s Palsy and treated her with steroids which alleviated her symptoms.

The patient’s neurologic symptoms, continued in early March when she developed decreased hearing in her right ear with complaints of dizziness. She was referred to an ENT specialist. Subsequently these symptoms progressed to involve weakness in the bilateral lower extremity. The patient denied any fever/chills/night sweats or rash. At that time the patient had become quite debilitated requiring hospitalization; an MRI of the brain and spinal cord were reportedly normal as well as a lumbar puncture. HIV, RPR, PPD testing were negative. An EMG showed plexopathy and at that time the patient was referred to a Neurologist at our hospital for further work-up.

The work up at our hospital revealed the following results:

- Lumbar Puncture: CSF-WBC 60, 58 lymphs, glucose 43, protein 150-staining for AFB, Fungal and Gram were all negative, cryptococcal antigen negative, bacterial AFB cultures and fungus culture were also negative.
- CSF flow cytometry comprised of 75% T-cells and less than 1% B-cells.
- Peripheral blood Flow Cytometry-showed a monoclonal (kappa) B-cell CD 5, CD 23, Dim CD 20 positive of 63% of cells consistent with CLL.

The patient was treated for suspected Guillain Barre with IVIG and Dexamethasone with clinical improve-

ment. At that time an infectious disease consult was requested and further history indicated interaction with her dogs and a travel history to Lake Hopatcong in rural New Jersey during the fall. The patient also described a febrile illness in December which was never diagnosed. She denied tick bites or a rash. The patient was subsequently diagnosed with Lyme disease due to her exposure history (dogs, wooded area), 7th and 8th cranial nerve involvement and pre-dominantly T lymphocytes in the CSF. She was started on IV Ceftriaxone and showed improvement in her symptoms. PCR of the CSF was positive for *Borrelia Ag.*

### 3. Discussion/Conclusions

This case presents a challenge of diagnosing Lyme disease in patients with CLL. Due to the difficulty in culturing *Borrelia* bacteria, the diagnosis of Lyme disease is typically based on the clinical exam findings, and a history of exposure in endemic areas. Serological testing can be used to support a clinically suspected case but is not diagnostic by itself. Standard serologic testing involves the Western blot and ELISA which depend on detecting antibodies in the serum. In relying on detection of antibodies in the serum for diagnosis of Lyme disease, we are presented with a problem in our patients with CLL in whom there is hypogammaglobulinemia secondary to B-cell malfunction.

As suggested by the German report by Schweighofer

*et al.* [1] flow cytometry of the CSF is the first step in ruling out CLL in the CSF. Report by Kalac *et al.* [2] describes a case of concomitant presence of neuroborreliosis and CLL in CSF responding to treatment with both antibiotics and steroids. Cerroni *et al.* [3] show the benefit of PCR testing in cutaneous manifestation Lyme disease in patients with CLL.

The lesson from our case is to keep high index of suspicion for Lyme disease in patients with CLL when the CSF flow cytometry shows predominantly T cells and early use of PCR to confirm the diagnosis of neuroborreliosis.

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