

## **Can Lyme disease cause dementia?**

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In a retrospective study, entitled [“Secondary dementia due to Lyme neuroborreliosis.”](#) Kristoferitsch and colleagues describe several case reports of patients diagnosed with dementia-like syndromes due to Lyme neuroborreliosis or Lyme disease that help address the question - can lyme disease cause dementia.<sup>2</sup>

### **Rapid improvement with antibiotic treatment**

The authors' case report featuring a 76-year-old woman demonstrates how Lyme disease can cause dementia-like symptoms. The patient developed progressive cognitive decline, loss of weight, nausea, gait disturbance and tremor over a 12-month period. She was referred to a neurology clinic for evaluation.

Three months earlier, the woman had been diagnosed with tension headaches and a depressive disorder. Medications, however, did not improve her symptoms.

Further testing revealed bilateral white matter lesions and an old lacunar lesion located at the left striatum. Extensive neurocognitive testing found “a severe decline of attention, memory and executive functions corresponding to subcortical dementia,” the authors write.

“LNB [Lyme neuroborreliosis] was diagnosed when further CSF [cerebral spinal fluid] examinations disclosed a highly elevated Bb-specific-AI indicating local intrathecal Bb-specific antibody synthesis,” Kristoferitsch writes.

After a 3-week course of treatment with ceftriaxone, the woman “recovered rapidly,” the authors write.

“In a telephone call in February 2018 at the age of 82 years, the patient reported no gait problems or cognitive impairment and had just returned from a trip to Cuba,” the authors write.

### **Woman admitted to psychiatric ward with severe dementia**

A 71-year-old woman with rapidly progressing dementia and short periods of altered consciousness was admitted to a psychiatric hospital. Six months earlier, she was having mild forgetfulness.

MRI results, which indicated slight mesiotemporal atrophy, along with neurocognitive testing supported an initial diagnosis of primary dementia.

“Later, the patient’s daughter reported a tick bite followed by a widespread rash,” the authors write. “Thus, LNB [Lyme neuroborreliosis] was suspected and confirmed by CSF investigations.”

After 2 weeks of antibiotic treatment with ceftriaxone, the woman’s symptoms subsided and her cognition improved.

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At her 5-year follow-up visit, the woman's "cognition was stable" and memory tests indicated a score above the mean for females her age, "which strongly argued against any dementing process," the authors write.

In reviewing the literature, Kristoferitsch et al. identified several signs and symptoms that may indicate that Lyme neuroborreliosis (or Lyme disease) is causing dementia in a patient.

**Distinguishing features of Lyme-induced dementia**

- Most of the patients or family members did not recall previous tick bites, an EM rash or symptoms of Lyme disease. Therefore, when "EM or other characteristic symptoms of early LB 1–2 years before the onset of dementia may if untreated serve as an indicator for chronic LNB."
- Unlike most neurodegenerative dementias, dementia caused by Lyme disease appears to progress rapidly, the authors write.
- "Weight loss is another symptom observed in LNB [Lyme neuroborreliosis]," the authors explain. "It is also compatible with the diagnosis of AD [Alzheimer's disease] but when it occurs in chronic LNB, it can be more pronounced, reaching up to 20 kg/year." Weight loss in patients with Alzheimer's disease is less prominent, the authors explain.
- Headache, nausea, malaise and vomiting are typically not symptoms of degenerative dementias, the authors explain. But, "might be associated with secondary dementia and thus also with chronic LNB [Lyme neuroborreliosis]."
- Gait disturbances at the onset or early in the disease which was observed in all cases of this study, makes the diagnosis of a probable AD [Alzheimer's disease] uncertain or unlikely."

Additionally, "In most patients, improvement of symptoms was reported already within a few days of antibiotic treatment," Kristoferitsch writes.

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The authors stress the importance of recognizing Lyme-induced dementia-like syndromes.

"It is essential to be aware of this manifestation of Lyme neuroborreliosis, because early antibiotic treatment will prevent permanent sequelae that may occur throughout the further course of the untreated disease," the authors conclude.

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**References:**

1. Blanc F, Philippi N, Cretin B, et al. Lyme neuroborreliosis and dementia. *J Alzheimers Dis.* 2014;41(4):1087-1093. doi:10.3233/JAD-130446
2. Kristoferitsch W, Aboulenein-Djamshidian F, Jecel J, et al. Secondary dementia due to Lyme neuroborreliosis. *Wien Klin Wochenschr.* 2018;130(15-16):468-478. doi:10.1007/s00508-018-1361-9

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