Pharmacist initiation of postexposure doxycycline for Lyme disease prophylaxis

Anita N. Jackson, K. Kelly Orr, Jeffrey P. Bratberg, and Frederic Silverblatt

Abstract

Objectives: To enhance public access to prophylaxis for Lyme disease following an identified *Ixodes scapularis* tick bite through pharmacist-initiated antibiotic therapy and to assess patient satisfaction with the pharmacy-based service provided.

Setting: Independent community pharmacy in Charlestown, RI, from May to October 2012.

Practice description: Under a collaborative practice agreement, trained pharmacists at an independent pharmacy identified patients eligible for postexposure antibiotic prophylaxis following attachment and removal of an *I. scapularis* tick (commonly known as a deer tick) and dispensed two 100 mg tablets of doxycycline. Patients were included if they were 18 years or older, provided informed consent, had an estimated time of tick attachment of 36 hours or more, had the tick removed within 72 hours of visit, denied contraindications to doxycycline therapy, and reported telephone access for follow-up. Patients enrolled in the study protocol were given counseling related to doxycycline, signs and symptoms of Lyme disease, and future tick prevention strategies.

Practice innovation: Pharmacist initiation of doxycycline prophylaxis has not been described in the literature previously. Successful pharmacist initiation of antibiotic prophylaxis may have broader implications for states with endemic Lyme disease or other infectious disease public health concerns.

Main outcome measures: Patient self-reported adverse outcomes and satisfaction with the pharmacy-based service.

Results: Eight patients enrolled in the study and completed the follow-up survey. The results indicated a high level of satisfaction with the pharmacy services provided, with no reports of the subsequent development of Lyme disease symptoms or major adverse events.

Conclusion: The project has expanded to three community pharmacy sites in southern Rhode Island based on this experience. Similar pharmacy-based collaborative practice models should be considered in highly endemic Lyme disease areas.

Keywords: Community pharmacy, Lyme disease, collaborative practice agreements.

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Lyme disease is a tickborne illness caused by the bacteria *Borrelia burgdorferi* and usually transmitted to humans by *Ixodes scapularis* (or "deer tick").[1] The prevention and/or treatment of Lyme disease is an important public health concern because of the increasing annual incidence of human infection and the potential for serious long-term sequela.[2] Lyme disease is the most commonly reported vector-borne illness in the United States, and in 2011, was the sixth most common illness reported to the National Notifiable Disease Surveillance System. Lyme disease is concentrated in the New England, mid-Atlantic, and upper Midwestern regions, with 96% of cases in 2011 reported from 13 states.[3]

Symptoms of Lyme disease may be nonspecific and mimic the symptoms of many other disorders. Usual symptoms include headache, myalgias, arthralgias, and fatigue, while physical exam findings may include rash (erythema migrans), arthritis, meningitis, and/or cranial nerve paralysis.[4] Untreated Lyme disease can progress to a serious illness, including cardiac and neurologic complications. With appropriate and prompt antibiotic treatment, most patients recover from Lyme disease without complications. However, up to 20% of patients may develop chronic subjective symptoms, known as posttreatment Lyme disease syndrome, the diagnosis and treatment of which is controversial in the literature.[5,6]

Patients living in areas with endemic Lyme disease may be assessed and treated with a 2 × 100 mg tablet regimen of doxycycline, to be taken together as a single 200-mg dose, within 72 hours following an identified *I. scapularis* bite to prevent subsequent infection with *B. burgdorferi*. This single-dose regimen is administered to reduce the risk of developing Lyme disease, the treatment of which requires longer courses of oral or intravenous antibiotics. In a randomized controlled trial with 482 participants, the relative risk for developing an erythema migrans rash, indicating the development of Lyme disease, following a tick bite was reduced by 87% with antibiotic prophylaxis.[7] According to a recent meta-analysis, an estimated 49 individuals need to be treated with postexposure antibiotics to prevent one case of Lyme disease; however, with careful assessment of tick engorgement with blood, the number needed to treat decreases to around 11.[8] Guidelines exist for determining which patients should be treated with postexposure antibiotics to prevent Lyme disease following a tick bite.[9] The most common adverse effects observed in clinical trials with single-dose doxycycline for Lyme prophylaxis included self-limiting nausea and vomiting.[7]

At a Glance

Synopsis: Under a collaborative practice agreement, trained pharmacists at an independent pharmacy in Rhode Island identified patients eligible for postexposure antibiotic prophylaxis following attachment and removal of an *Ixodes scapularis* tick (commonly known as a deer tick) and dispensed doxycycline to the patients. The results indicated a high level of patient satisfaction with the pharmacy services provided and no reports of subsequent development of Lyme disease symptoms or major adverse events.

Analysis: *Community pharmacists can play a critical role in prompt access to medication when treatment is a time-sensitive matter. Areas with endemic Lyme disease rates are predominately located along the Eastern Seaboard and Great Lake regions, where residents and tourists may be at increased risk of exposure to infected* I. scapularis *ticks during the summer months due to the popularity of outdoor activities in wooded or grassy areas. Tourists may particularly benefit from this pharmacy-based service to reduce the need for an urgent care visit and to enhance awareness related to the recognition of Lyme disease symptoms through pharmacist education. Pharmacy-based collaborative practice models similar to that described here should be considered in endemic areas to increase timely access to antibiotic prophylaxis.*

Objectives

The objectives of this study were to enhance public access to prophylaxis for Lyme disease following an identified *I. scapularis* bite through community pharmacist-initiated antibiotic therapy and to assess patient satisfaction with the pharmacy-based service provided.

Setting and practice description The practice setting was an independently owned pharmacy located in southern Rhode Island, where Lyme disease is hyperendemic, with *B. burgdorferi* infection rates of isolated *I. scapularis* ticks approaching 50%.[10] Pharmacy staff consisted of two full-time pharmacists and one part-time pharmacist who also is the owner. All on-duty pharmacists participated in the study protocol and were trained in the assessment and prophylaxis of Lyme disease by study investigators from the University of Rhode Island and successfully completed the certificate program in human participant research through the Collaborative Institutional Training Initiative. The pharmacy prescription volume averaged 2,100 prescriptions per week, with an increase in the summer because of an influx of beach and campground tourism. Group homes and assisted-living facilities accounted for approximately one-third of the pharmacy's prescriptions annually. The pharmacy operated and was open to the public 7 days per week, with more limited hours on the weekend. Patients were recruited through