Lyme Disease in Children

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KEYWORDS

• Children • Tick bite prevention • Tick bite management
• Increased intracranial pressure • Optic nerve • Lyme meningitis

KEY POINTS

- The diagnosis and management of Lyme disease in children in general is similar to that in adults, but it should be noted that doxycycline is not an initial empiric choice for children 8 years and younger.
- The prognosis of Lyme disease is excellent in almost all children, including for those who present with the late disseminated manifestation of Lyme arthritis.
- Increased intracranial pressure is observed frequently in children as a complication of acute disseminated Lyme disease, usually in acute neurologic disease, and entails a risk of visual loss.
- Serologic tests are often ordered inappropriately, and should be done only if a child's signs and symptoms are consistent with Lyme disease.
- Children frequently get tick bites, so pediatricians and family practitioners should be familiar with the prevention and management of tick bites.

Lyme disease or Lyme borreliosis owes its name to the investigation of an unusual cluster of children with unexplained arthritis occurring in Lyme, Connecticut and surrounding communities.[1] Some of the first cases of erythema migrans (EM; the characteristic rash of localized Lyme disease) in the United States also were observed in children, in Connecticut and Massachusetts in 1975.[2,3] Lyme arthritis was subsequently recognized to be part of this multisystem disease. The age-specific incidence of Lyme disease is higher in children than in adults (**Fig. 1**), presumably because of their increased exposure to ticks. About a quarter of all reported cases in the United States occur in children who are younger than 14 years of age.[4]

CLINICAL MANIFESTATIONS

As in adults, children have signs and symptoms of either early localized, early disseminated, or late Lyme disease. Early disseminated disease manifests in the skin, nervous system, heart, or with musculoskeletal symptoms, in those who develop

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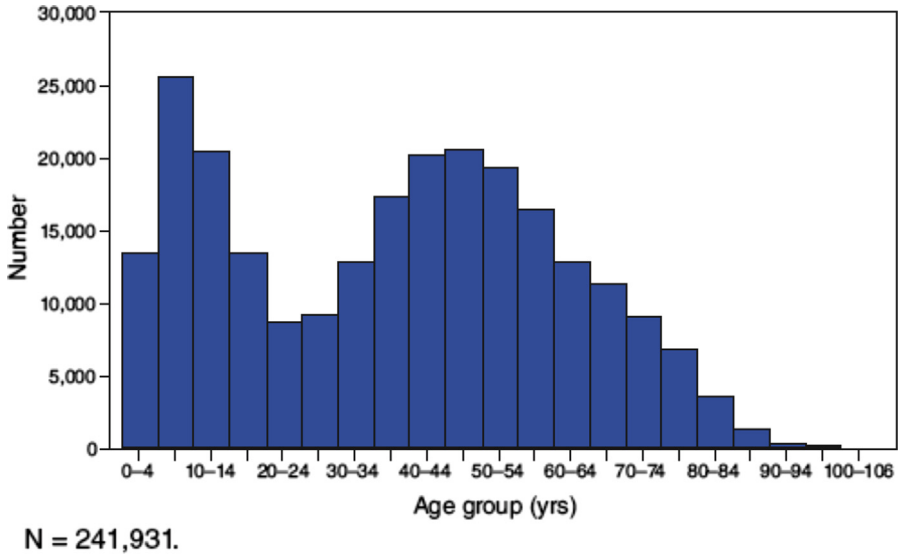

Fig. 1. Number of Lyme disease cases reported, by age group, 1992–2006. (*From* Bacon RM, Kugeler KJ, Mead PS, Centers for Disease Control and Prevention (CDC). Surveillance for Lyme disease—United States, 1992–2006. MMWR Surveill Summ 2008;57(10):1–9.)

spirochetemia after the tick bite. Some children present with more than one manifestation. A prospective study of children in five pediatric practices in hyperendemic towns of Southern Connecticut provided valuable information on the spectrum of clinical presentation of Lyme disease in children.[5] Most (89%) presented with either single or multiple EM and more than a third presented with a sign of dissemination as the presenting manifestation (multiple EM, arthritis, facial palsy, meningitis, or carditis). Children with multiple EM had a higher incidence of systemic symptoms than those with a solitary lesion. There are a few differences in the spectrum for Lyme disease acquired in Europe, where neurologic manifestations are notably more common in children (17%–38% of cases) than in adults, and Bannwarth polyradiculoneuritis also is a manifestation of Lyme disease in children.[6,7] Borrelial lymphocytoma, a localized tumor-like growth most commonly found on the nipple or earlobe, is common in children and only occurs on the Eurasian continent.[8]

Erythema Migrans

EM is a roughly circular or oval lesion that appears at the site of the tick bite after an incubation of about 1 to 31 days (mean, 10 days). At least two-thirds of solitary EM lesions are initially erythematous plaques with or without an enhanced central erythema, rather than a "bull's eye" or ring shape.[9] Because small ring-shaped lesions from insect bites are more common than Lyme disease in children, pediatricians should not rush to treat a lesion as EM. The differential diagnosis includes insect and tick-bite skin reactions. Unlike these reactions, EM enlarges gradually, and close follow-up establishes the diagnosis if the lesion attains a diameter of at least 5 cm, the minimum diameter required to meet the Centers for Disease Control and Prevention case definition of EM. Rarely, the lesion may have a somewhat atypical presentation with a central vesicular or necrotic area.[10] There can be mild pruritus or a stinging sensation. EM can occur anywhere on the body, but about half of tick bites in children are sustained on the head or neck, so an EM lesion on the scalp could be obscured