

A CASE OF LYME DISEASE (LYME BORRELIOSIS)

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Abstract- While an important infectious disease in the United States and Eurasia, Lyme disease is rare in Iran. We present a 9-year old boy admitted in Children's Medical Center in December 2001 with final diagnosis of Lyme disease. On admission he showed arthritis and a history of previous skin lesions. Serologic examination including enzyme-linked immunosorbent assay and Western blot was positive for Lyme borreliosis. Patient was treated with doxycycline for four weeks, with good results. Although it is difficult to confirm diagnosis of Lyme disease in our patients, we should be aware that Lyme borreliosis is also found in Iran.

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Key words: Erythema migrans, arthritis, serologic tests, borrelia, Lyme disease

INTRODUCTION

Lyme disease is a multiorgan infection caused by spirochete *Borrelia burgdorferi* which is seen in United States; *B. afzelii* and *B. garinii* are seen in Europe and Asia (1-6).

A complete presentation of the disease is an extremely unusual observation in which a skin lesion results from a tick bite and is followed by heart and nervous system involvement and later on by arthritis. The only sign that enables to establish a reliable clinical diagnosis of Lyme borreliosis is erythema migrans. Microbial or serological confirmation of borrelial infection is needed for all manifestations of the disease except for typical early skin lesions.

This is the first report of Lyme disease from Children's Medical Center. Considering earlier report of 3 patients with Lyme borreliosis by our colleagues from Imam Khomeini Hospital (7), all physicians must be aware that Lyme disease can also be found in our country.

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CASE REPORT

A 9-year old male was admitted to the division of infectious disease of Children's Medical Center, Tehran, in December 2001. He was a boy from a village of Varamin (a city near Tehran) admitted with arthritis of left elbow joint. A week ago he had arthritis of left ankle. Arthritis began 4 weeks after skin lesions compatible with erythema migrans on right posterior thigh and left posterior foot. The skin lesions were associated with fever, transient conjunctivitis and regional lymphadenopathy on neck.

The physical examination showed oral temperature of 37 °C, a respiratory rate of 20/minute and a blood pressure of 100/60 mmHg. Chest roentgenogram was normal. The complete blood count was 7500/mm³, erythrocyte sedimentation rate (ESR) was 50 mm/hour, C reactive protein was positive, anti streptolysin O (ASO) titers was 250 Todd units and anti-nuclear autoantibody (ANA) was negative. Examination of the synovial fluid of elbow joint showed elevated leukocyte counts (3000 cells/mm³) with a predominance of polymorphonuclear leukocytes. Gram stained smear and culture were negative for bacteria. The results of a sample of blood sent to Germany for serologic tests was positive for ELISA and Western blot in 31k/Dalton (OSPA) and 23 k Dalton (OSPC).

The patient was treated with doxycycline for 4 weeks. The swelling and pain resolved after 2 weeks. He was well 12 months after discharge.

DISCUSSION

Lyme disease has become an important infectious disease in the US and Eurasia but it is rare in our country. Lyme disease takes its name from the town Lyme in Connecticut, US, where it was recognized in 1970s. Lyme disease presents with diverse clinical signs and symptoms and several variations in the course of the disease (Table 1). Lyme disease is an infection caused by spirochete *B. burgdorferi* in US and *B. afzelii* and *B. garinii* in Europe and Asia. The infection also is reported from Russia, China and Japan (1-6).

The most common manifestation of early localized Lyme disease is erythema migrans that generally appears at the site of a tick bite in seven to 10 days after the bite. It can be recognized in up to 85% of patients and is frequently located around the knees, axilla and groins. Erythema migrans usually

begins as a red macule or papule, which expands over a course of days to weeks, presumably as the spirochetes spread centrifugally in the skin. Secondary cutaneous lesions without tick bites may develop after hematogenous spread of spirochetes. Local symptoms include pruritus, tenderness or paresthesia. Our patient had erythema migrans with pruritus.

Certain skin and soft tissue manifestations of Lyme disease such as lymphocytoma and acrodermatitis chronica atrophicans are usually caused by *B. garinii* and *B. afzelii*, respectively, and are seen more frequently in Europe than in the US (1-2). Systemic complaints in patients with Lyme disease are more common in the US than in Europe and Asia, perhaps as a result of infection by a more virulent genospecies (*B. burgdorferi* rather than *B. afzelii*) (1-2). The most frequent symptoms of culture confirmed cases include fatigue (54%) myalgia (44%), arthralgia (44%), headache (42%) fever and/or chills (39%) and stiffness of the neck (35%). Physical findings include regional lymphadenopathy (23%) and fever (16%) (2). Our patient had fever and regional lymphadenopathy.

Table 1. Manifestation of Lyme borreliosis

Cutaneous findings	
Erythema migrans	Expanding erythematous patch (> 5 cm in diameter); potential for secondary erythema migrans lesions
Lymphocytoma cutis	Painless bluish-red nodule or plaque on ear lobe, nipple or scrotum
Acrodermatitis	Longstanding red to bluish discoloration, usually
Chronica atrophicans	On the extensor surfaces of extremities, sometimes associated with swelling, ultimately becoming atrophic (sometimes associated with peripheral neuropathy and adjacent periarticular nodules)
Extracutaneous findings	
Carditis	Acute onset of arterioventricular contraction deficit (grade II or III) that resolves in days to weeks; sometimes associated with perimyocarditis. This definition dose not include palpitations, bradycardia, bundle- branch block or myocarditis without other objective manifestations of Lyme borreliosis
Neuroborreliosis	Lymphocytic meningitis, cranial neuritis (particularly peripheral facial nerve palsy), radiculoneuropathy and, rarely, encephalomyelitis. This definition dose not include headache, fatigue, paresthesia, or stiff neck without other objective symptoms of Lyme borreliosis
Arthritis	Recurrent brief attacks (weeks or months) of objective joint swelling in one or few joints, typically in one or both knees. This definition dose not include chronic progressive arthritis not preceded by brief attacks, chronic symmetrical polyarthritis or arthralgia, myalgia or fibromyalgia without other objective symptoms of Lyme borreliosis

A case of Lyme disease

The greater variety of genospecies of *B. burgdorferi* in Eurasia may account for different manifestations of Lyme disease in different geographic areas. Patients with early Lyme disease may also present with symptoms similar to those caused by virus infections without erythema migrans. However, because the sensitivity and specificity of serological tests for early Lyme disease are poor and because viral illness-like symptoms from causes other than Lyme disease are common, it is difficult to confirm diagnosis of early Lyme disease in patients with non-specific acute symptoms.

Late extracutaneous manifestations of Lyme disease are characterized by carditis, neuroborreliosis and arthritis. Carditis due to *B. burgdorferi* typically develops weeks to months after infection and is usually manifested by arterioventricular block. Carditis was especially reported in US patients before the widespread use of antibiotics for erythema migrans. We could not find carditis in our patient.

In up to 10% of untreated patients, *B. burgdorferi* may cause chronic neuroborreliosis sometimes after long periods of latent infection, thus making correct diagnosis very difficult. The symptoms of neuroborreliosis usually develop within weeks after the onset of erythema migrans. In Europe and Asia, the frequency of neuroborreliosis seems to be higher, potentially due to the greater neurotropism of *B. garinii*, which has not been isolated in US. This sign also was not seen in our patient.

Months after the onset of illness, about 60% of untreated patients in the US begin to have intermittent episodes of arthritis, especially the knee, shoulder, elbow, ankle, wrist and hip. The arthritis occurs weeks to months after the initial infection. Although the joint is typically swollen and tender, intense pain associated with septic arthritis is usually not present.

Although *B. burgdorferi* DNA can be detected by polymerase chain reaction (PCR) in the synovial fluid of up to 85% of untreated patients with Lyme arthritis, *B. burgdorferi* has rarely been isolated from joint fluid cultures (8). It was not possible for us to perform PCR examination. However, since culture and PCR can only be done satisfactorily in specialized laboratories, antibody detection is currently most widely used in microbiological diagnosis of Lyme disease. Clinical and serologic tests were confirmed in our patient. He was treated with antibiotic and on follow-up he was well.

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