

Case Report

Borreliosis: Early Diagnosis based on Clinical Suspicious

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Abstract

Background: Lyme disease, (LD) is the most common tick-borne disease. It is caused by *Borrelia burgdorferi*. Lyme disease is a systemic illness. It can involve different organs, causing a large variety of clinical manifestations. LD is potentially lethal in chronic and late stages, so it is important to consider the antibiotic therapy at early stages.

Cases Report: Here we present a 29-year-old young woman who was admitted to the hospital with fatigue. She claimed to be bitten one day before the admission. She was otherwise a healthy individual.

Conclusion: Through this reported case, we highly recommend the early clinical diagnosis of Lyme disease in endemic areas.

Keywords: Lyme disease, Early diagnosis

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Introduction

Lyme disease (LD), also known as Lyme Borreliosis, is the most common tick-borne illness caused by *Borrelia Burgdorferi*¹. Classically it is presented within three stages: early localized, early disseminated and late disease^{2,3}. The first stage is best described with the typical skin lesion called erythema migrans. This lesion is best described as the "bull's eye"⁴. The second stage is well known for its multiple skin lesions, which are usually far from bite-site. The multi organ failure could happen in this stage⁵. The last stage which may develop even years after the initial infection, typically presents with arthritis⁶. The diagnosis of LD has two steps. Step one is the determination of the presence of *B. burgdorferi* antibodies through ELISA test. If the test

is positive, Western blot test will be conducted afterwards. However, the diagnosis of the disease is still a challenging issue. The reason is the high rates of false negative results. Therefore, most of the times the LD is diagnosed objectively by the practitioner and the antibiotic therapy is started³. There are very different regimens suggested. However, the routine regimen for adults includes a 14-day period of doxycycline, amoxicillin, or cefuroxime axetil^{7,8}.

Case Report

In the late spring, a 29-year-old young woman was admitted to Vali-e-Asr hospital of Zanjan. She gave a history of being bitten by something. She complained about fatigue, malaise and feeling weak. All the symptoms started the day after being bitten. She was

otherwise a healthy individual without a history of previous hospitalization. On the examination she was not febrile ($T=37.2^{\circ}\text{C}$). She had no dyspnea or respiratory distress ($\text{RR}=20$). She had a mild hypotension ($\text{BP}=100/65$ mmHg) and a mild sinus tachycardia ($\text{PR}=105$). Fundoscopy of her eyes appeared to be normal. Her auscultations were also normal and the ECG had no signs of arrhythmia. On her right buttock there were three skin lesions. The red patches were round, erythematous, painful and tender in touch. The biggest lesion was approximately about 6×8 cm in size. The bite-site was noticeable in the center and the lesions looked like the typical "bull's eyes" (Figure 1). She was sure that the lesions were first small and they developed into large painful itchy ones in just one day.

The initial laboratory evaluation showed no anemia or leukocytosis. Her liver function tests were normal. The ESR 37 mm/hr and CRP 106.9 mg/L were compatible with an inflammatory state. First of all we decided to rule out any abscess formation or collection. Therefore, an ultrasonography was performed. The sonography reported subcutaneous superficial hypo echo regions as a sign of inflammation.

Considering the clinical manifestations and the characteristic bull's eye shaped lesions, we suspected the early stage of Lyme disease. Although we performed an ELISA test at Zanjan Vali-e-Asr hospital laboratory to confirm our diagnosis. We performed Xpert EV via Cepheid device. In order to prevent the disease from developing into the late stage, we started anti-biotic-therapy. We chose Amoxicillin 500 mg per 8hrs. After only one day there was a dramatic improvement in the lesions (the erythema was improved, the pain was almost subsided and she there was no tenderness in touch).

The patient was discharged from hospital on the third day and was prescribed Amoxicillin 500 mg three times a day for another 7 days. The six-month follow up of the patient revealed no systemic findings.

Discussion

Lyme disease is famous as the great imitator and can mimic almost all kinds of different diseases. It can be asymptomatic leaving it hard to be diagnosed before its complications. Also it may be diagnosed with its



Figure 1. Round and erythematous, bull's eye shaped lesions on the patients' right buttock.

fatal complications such as carditis⁹. The incubation period of the typical "bull's eye" skin lesions may vary from one day to one month and even years in rare cases³. In summertime, in countries which are known as endemic regions for Borreliosis, any flu-like syndrome with characteristic erythema migrans or the signs of sunburns must be considered as LD; even if the confirmatory serologic tests are absent¹⁰. Two serological tests are currently used as the diagnostic tools for Lyme disease: ELISA and Western blot. They are both indirect tests with a 50% of false negative responsiveness and poor sensitivity. They only support the diagnosis of LD. We cannot solely depend on the test results to diagnose the disease. Therefore, it is highly recommended to consider the clinical suspicion to make the diagnosis. The importance of early diagnosis is that, we can start the antibiotic therapy as soon as possible. If LD becomes chronic it can be potentially lethal with high rates of morbidity^{11,12}. There are variable regimens to treat LD. However, according to IDSA (Infectious Disease Society of America) the preferred antibiotics in case of early diagnosed Lyme disease for adults consist of a 14-day period of Doxycycline, Amoxicillin or Cefuroxime axetil^{7,13,14}. We suspected LD based on the bite history and the typical lesion type. Indeed to confirm our diagnosis we requested the ELISA test. Unfortunately there was a delay to report the results of the ELISA test due to some financial issues. However, when the results were reported, the ELISA test was

negative for *B. burgdorferi* within the patient. It must be mentioned that we considered the specialist's clinical suspicion on the diagnosis and started the antibiotic therapy. The negative result must be due to high rate of false negative reports of ELISA. Since the ELSA test was negative, not far from what we actually expected, we performed PCR using the Cepheid EV PCR. The results were positive confirming our early diagnosis. Our patient perfectly responded to Amoxicillin and the follow-ups were overwhelming.

Conclusion

It is important to make the clinical diagnosis of Lyme disease and start the antibiotic therapy even in the absence of confirmatory serologic tests, especially in the endemic areas. Because it may take several weeks for the serology to become positive (excluding the false positive tests) and it is important to initiate the antibiotics in the early stages of the disease to prevent the complicated, life threatening complications.

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