CASE REPORT

Annals of Agricultural and Environmental Medicine
www.aaem.pl

Multifocal erythema migrans – rare presentation in a 2-year-old child

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Pałdyna B, Pałdyna M. Multifocal erythema migrans – rare presentation in two years old child. Ann Agric Environ Med. doi: 10.26444/aaem/193508

Abstract

Introducton. Ticks are a vector of infectious diseases, both bacterial and viral. Among ticks, Lyme disease is considered to be the most common vector-borne disease in North America and Europe. Many countries in Europe are endemic for Lyme disease, especially the central and north-eastern regions. Lyme disease is characterized by numerous signs and symptoms from various organ systems including the skin, joints, heart and nervous systems. Early stage manifesting with skin symptoms occurs in most infected people. Erythema multiforme appears at the site of a tick bite usually within one month. Typical skin lesions enable the diagnosis based on the clinical picture without performing any additional tests. Diagnostic difficulties may be caused by less common atypical and multiple skin lesions, and if the patient has not noticed a tick bite. The case report concerns a child with erythema multiforme, and reviews the literature on erythema migrans and its atypical forms.

Key words

Lyme disease, Borrelia infections, tick, doxycycline, Ixodes, Spirochaetales

INTRODUCTION

Lyme disease is a bacterial infection caused by the spirochete Borrelia burgdorferi, transmitted by Ixodes ticks [1, 2]. Borrelia burgdorferi sensu lato is divided into 20 genetic species, of which 3 are considered pathogenic to humans – Borrelia burgdorferi sensu stricto, Borrelia afzeli and Borrelia garnii [3]. Skin lesions are the most common symptom of Lyme disease and occur in 80% of patients [2]. Skin manifestations of early stage infection are erythema migrans (EM) and borrelial lymphocytoma of the skin (BL). Acrodermatitis chronica athropicans (ACA) is also a manifestation of a late stage [1].

CASE REPORT

A 2-year-old girl was consulted by a paediatrician due to an erythematous lesion on the left cheek. The lesion was round in shape, evenly coloured, and approximately 1 centimeter in diameter. Three weeks earlier, the patient's caregiver noticed and removed a tick from behind the left auricle. 7 days after the first consultation, the lesion enlarged and its diameter reached approximately 2.5 centimeters (Figure 1). Moreover, several new erythematous lesions appeared on the patient's body: 2 in the left popliteal fossa and in the buttock area, were oval in shape and approximately 5 centimeters in length (Figure 2, Figure 3). All lesions had brighter central part surrounded by darker edge. Due to the atypical manifestation the patient was referred for Lyme disease screening tests with ELISA method. Antibody test results for both IgM and IgG were positive, and confirmed by the Western Blot test.

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Received: 29.07.2024; accepted: 17.09.2024; first published: 07.10.2024

Figure 1. Barely visible erythematous edge of lesion on left cheek

Figure 2. Lesion on left buttock

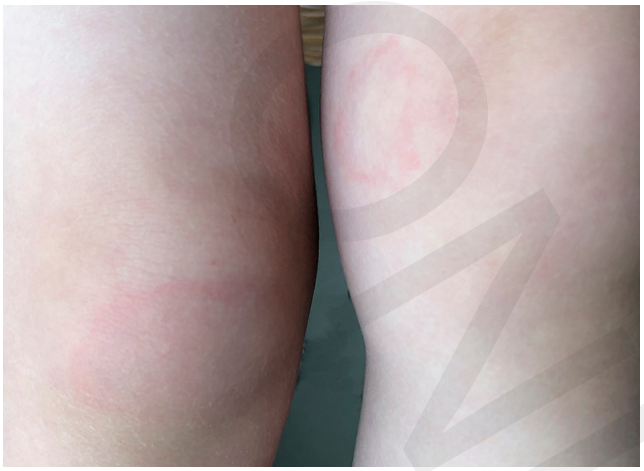

Figure 3. Symmetric lesions on both popliteal fossae

The treatment included amoxicillin administered in a dose adjusted to the patient's body weight, which resulted in a resolution of the skin lesions.

DISCUSSION

Erythema migrans is associated with the multiplication of spirochetes in the skin at the site of inoculation [2]. It can appear within 3 days to 3 months, but usually within 3 – 30 days [1, 3, 4, 5]. Localization varies depending on the site of the bite. In children, the most common regions affected are the head and neck, and in adults the extremities or trunk [1, 5]. The typical lesion presents as a red to bluish-red round or oval patch which enlarges centrifugally. It could be single-coloured or have a central clearing with a darker border. Some lesions have a target-like morphology, also called a bull's eye, with a darker central part and border with a clearing in between [3, 6, 7]. Typically, the lesion is not accompanied by subjective symptoms, but pain or itching may be referred [6]. The lesion enlarges rapidly, and if the diameter exceeds 5 centimeters, it is considered pathognomonic for Lyme disease [1, 6]. The maximum size of the lesion, however, is unlimited [1]. Attention should be paid to the fact that up to 79% of patients do not remember being bitten by a tick [2, 6, 8].

Atypical lesions may have a diameter of less than 5 centimeters, irregular shape, red-violet spots, vesicles or petechiae on the surface, and could be accompanied with atrophic changes. The case in which a tick was still present in the central part of the EM lesion has also been described [6]. If left untreated, the lesion disappears within a few weeks, usually up to 4 weeks after the bite [5]. Diagnosis in the case of EM is based on the clinical picture, and serological tests are not recommended. Moreover, tests performed during the occurrence of EM may be negative [4].

Multiple erythema migrans (MEM) is a cutaneous manifestation of early disseminated Lyme disease associated with the spread of spirochetes through the bloodstream [1]. MEM appears several weeks to months after innoculation [3]. The appearance of a lesions resembles classic EM, but may be more discreet, less erythematous, and may have atypical morphology [3]. In Europe, MEM is found in 8% of patients with Lyme disease, and in the USA up to 25–48% of patients [1, 8]. The number of lesions also varies between continents. In Europe, 2 or 3 lesions are most often found, while in the USA more than 20 lesions have been recorded [8]. Severe systemic symptoms and abnormalities in laboratory tests are more often in the course of MEM [1].

Skin lesions in the course of Lyme disease in children are similar to those in adults, except for the most common location, which in children is the head and neck [5]. Vertical infection with the spirochete Borrelia from the infected mother through the placenta to the foetus is also possible in the first month of pregnancy [6]. A case of congenital infection was described in a child whose mother had EM during pregnancy. EM was observed in the child, and the spirochete Borrelia garnii was isolated from the lesion. Rapid improvement was obtained after the introduction of antibiotic therapy [9].

Early initiation of treatment is key to preventing the spread of spirochetes and the involvement of organs other than the skin. According to recommendations, the treatment of Lyme disease involves the administration of an antibiotic that is active against B. burgdorferi. The choice of antibiotic and the duration of treatment depend on the form of Lyme disease, the patient's age, and other situations, such as age, pregnancy, allergies. Antibiotic therapy lasting longer than 28 days is not recommended, as is the use of methods with unconfirmed effectiveness [1]. There is a report on the effectiveness of doxycycline for 7 days in EM [10].

First line treatment of EM in adults include doxycycline, amoxicillin and cefuroxime axetil (Tab. 1) [1]; however, doxycycline should not be used in children under 8 years of age due to the risk of permanent tooth discolouration, enamel hypoplasia, and growth disorders [11]. For this reason, doxycycline is also contraindicated in pregnant women and breastfeeding women [11]. An antibiotic from the macrolide group – azithromycin – should only be used in cases of contraindications to the use of doxycycline, and allergies to semi-synthetic penicillins [1].

CONCLUSION

As the lesions seen in erythema migrans are pathognomonic and are easily diagnosed, atypical and multiple lesions could be a huge clinical problem and lead to delay in the treatment. In doubtful cases, laboratory tests are useful and should be performed to confirm diagnosis.

Table 1. Antibiotics preferred in the treatment of EM [1]

Antibiotic	Treatment duration (days)
First choice	
Doksycyklina	7–21
Amoxicillin	14–21
Cefuroxime axetil	14–21
Second choice	
Azithromycin	5–10

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