LYME DISEASE, ATYPICAL SKIN MANIFESTATIONS

G. Stinco

SUMMARY

Lyme borreliosis is a multisystemic infection associated with a variety of clinical manifestations. Rather often it causes largely incomplete, hidden clinical findings or quite atypical variants. In the present paper less common skin variants of Lyme borreliosis are reviewed including localized alopecia at the site of erythema migrans, urticaria, erythematous papules, nodular panniculitis (Pfeifer-Weber-Christian), sclerocutaneous skin conditions, Raynaud's syndrome, benign lymphocytic infiltrate of Jessner-Kanoff, cutaneous B-cell lymphoma, sarcoidosis, granulomatous thrombophlebitis, generalized exanthema, granuloma annulare, pityriasis rosea and purpura. Different species of *Borrelia burgdorferi* have been associated with different clinical manifestations. This may explain the rarity of some clinical variants. The agent of Lyme disease may be responsible for some cases, but further observations are necessary to differentiate atypical Lyme variants and casual associations.

KEY WORDS

*Lyme borreliosis, atypical manifestations, Borrelia burgdorferi*

INTRODUCTION

Lyme borreliosis is a multisystem infectious disease capable of producing a wide variety of clinical pathologic conditions. Complications of this infection can involve many organ systems, especially skin, joints, nervous system, eyes and heart. These manifestations may be acute, or evolve slowly over months or years. *Borrelia burgdorferi (Bb)* infection rather often causes oligosymptomatic manifestations or quite atypical variants. Diagnostic confirmation of Lyme disease may be difficult, because isolation of *Bb* is usually problematic. Therefore numerous clinical variants have been associated with Lyme disease on the basis of a positive tick bite history, stay in an endemic area, positive serologic results or response to antibiotic therapy. It must also be considered that in endemic areas the presence of an incriminating parameter e.g. seropositivity may lead to overdiagnosis.

In the present paper less common skin variants of Lyme borreliosis are reported.
ATYPICAL VARIANTS

Skin manifestations and histopathological findings depend on the stage of infection and vary from local inflammatory infiltrates to chronic atrophic skin diseases.

Erythema migrans (EM) is the dermatological hallmark of early Lyme borreliosis. There is a considerable variation in the appearance of EM. Particularly its central portion may show equal or greater erythema than the periphery, blue discoloration, purpura, induration, necrosis or ulceration (1,2,3). A low rate (8%) of patients with EM may have a lesion with vesicles (4). Lesions may also have different shapes or textures (1,2). Localized alopecia at the site of EM is also reported (5). Scaling has been occasionally observed on some lesions (1). Recently cases of Lyme borreliosis with erythematous papules or irregular erythema, accompanied by mild burning and itching were observed in patients in whom EM was absent (6). Besides cases of Lyme disease disclosed as urticaria (7) and also cases of urticarial vasculitis (8) were reported.

Involvement of subcutaneous tissue has been observed only very rarely. Hassler et al. (9) reported two patients suffering from nodular panniculitis (Pfeifer-Weber-Christian) with the evidence that the disease was caused by Bb. In fact in one of the cases Bb was repeatedly isolated from skin and subcutaneous tissue biopsies. A septal panniculitis (10) as a manifestation of Lyme disease was observed in a 22-year-old woman who presented fever, chills, photophobia, and headache, followed by a centrally clearing erythematous skin eruption, migratory polyarthralgias, conjunctivitis, and subsequently, tender, nodular skin lesions. Antibodies to Bb were present and skin biopsy revealed an acute septal panniculitis.

Many scleratrophic skin conditions have been reported as possible late manifestations of Lyme disease. These include: lichen sclerosus et atrophicus (11,12) morphea (11,12,13,14,15,16,17), linear scleroderma (14), disseminated localized scleroderma (18), generalized scleroderma (19), morphea profunda (20), atrophoderma Pasini-Pieriini (21), Shulman syndrome (or eosinophilic fasciitis) (22,23), progressive facial hemiatrophy of Parry-Romberg (24), erythema chronicum migrans et atrophicans (25) and porphyria cutanea tarda with sclerodermic alterations (26). Clinical, immunological and microbiological data seem to indicate a clear relationship between infection with Bb and scleratrophic lesions, however many other published studies do not support these findings and have cast doubt on an etiological role for this spirochete in these diseases (27,28,29,30,31,32).

Kristof et al. (33) suggested the association between Lyme borreliosis and Raynaud's syndrome.

The hypothesis of a borrelial etiology has been suggested in the benign lymphocytic infiltrate of Jessner and Kanoff (22,34) and later in one case it has been possible to provide evidence of Bb by polymerase chain reaction (35). Cutaneous B cell lymphoma may also be associated with Bb infection. The occurrence of acrodermatitis chronica atrophicans and malignant lymphomas in the same patient was frequently reported in literature before Bb was recognized. Garbe et al. (36) presented four patients with low-grade malignant B cell lymphoma of the skin in association with chronic Bb infection. Plaque-shaped or nodular erythematous lesions with ill-defined borders were observed. Clinical progression was slow, up to 7 to 15 years. Extracutaneous involvement was found in only one case. In three cases no clinical signs of Bb were found; in one patient acrodermatitis chronica atrophicans was present.

Hua et al (37) suggested that Bb infection may be a cause of sarcoidosis. They measured antibodies to Bb in 33 patients with sarcoidosis confirmed clinically and histopathologically. The results showed that 82% of the patients were positive for anti-Borrelia antibodies. Besides Bb was isolated from a patient's blood. The antibody titers and serum angiotensin converting enzyme rapidly decreased to nearly normal levels after antibiotic treatment. According to these findings they considered that Bb may be a cause of sarcoidosis and this last may be a specific type of Lyme disease.

A granulomatous thrombophlebitis in Lyme borreliosis has been reported (38). A patient with Lyme disease developed a thrombophlebitis saltans. Histopathologically there was a granulomatous perivasculitis with deposits of IgG, IgA, IgM, C3 and C4 in the vessels. Antibody titers against Bb were elevated, but no anti-cardiolipin antibodies were found.

As Bb is capable of eliciting numerous clinical manifestations based on serological criteria also granuloma annulare (39) and pityriasis rosea (40) were reported as manifestations of Lyme borreliosis.

Prinz et al. (41) observed another possible clinical manifestation characterized by a generalized exanthema, acute hepatitis with porphyria cutanea tarda with sclerodermic alterations. Clinical, immunological and microbiological data seem to indicate a close relationship between infection with Bb and scleratrophic lesions, however many other published studies do not support these findings and have cast doubt on an etiological role for this spirochete in these diseases.

acta dermatovenerologica A.P.A. Vol 3, 94, No 1/2
and the high IgG antibody titre against Borrelia suggested a causal relationship with the previous thrombocytopenic purpura.

Schonlein-Henoch purpura seems to be also a possible manifestation in Bb infection (43, 44).

CONCLUSIONS

The Borrelia etiology of the above mentioned skin manifestations may often be only suspected and, owing to the paucity of these observations, it is still under discussion whether they are casually associated pathologies or atypical variants of Lyme borreliosis.

Recently three separate genospecies have been identified: Borrelia burgdorferi sensu stricto, Borrelia garinii and Borrelia afzelii VS461 (45). Different strains of Bb have been associated with different clinical manifestations. Therefore it is possible that infection with a certain strains of Bb will lead to the development of a distinct skin lesion, which fact may explain the rarity of some clinical variants.

At present it seems premature to enlarge the spectrum of Lyme borreliosis skin manifestations in an exaggerated fashion. The agent of Lyme disease may be responsible for some cases, but to differentiate atypical Lyme variants and casual associations further observations with diagnostic proofs of Bb in the affected tissues are necessary.

REFERENCES


AUTHOR'S ADDRESS
Stinch Giuseppe, MD, Institute of Dermatology, University of Trieste
Ospedale di Cattinara, Strada per Fiume 34149, Trieste, Italy