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Lyme Borreliosis as a Trigger of Dermatomyositis and Cerebral Thrombosis. Clinical Presentations of This Unusual Manifestation of Lyme Disease

Victoria Birlutiu[1,2]* and Rares Mircea Birlutiu[1]

[1]Lucian Blaga University Sibiu, Faculty of Medicine Sibiu, Romania

[2]Academic Emergency Hospital Sibiu, Romania

***Corresponding author:** Victoria Birlutiu, Lucian Blaga University Sibiu, Faculty of Medicine Sibiu, Romania, Email: victoriabirlutiu@yahoo.com

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ABSTRACT

Lyme disease represents a multisystemic tick-borne disease transmitted by ticks from the Ixodes genus. It is estimated a number of 20-100 cases per 100000 inhabitants in North America and around 100-130 cases per 100000 inhabitants in Europe. The disease evolution in stages is easily to be recognized when knowing the moment of the tick bite and it gets difficult in cases where this moment cannot be determined. Diagnostic difficulties are justified by the lack of recognition of the time of the bite in about 64% of cases of Lyme disease in Europe, and in 25-30% of cases in the United States. The association of Lyme disease with dermatomyositis and the occurrence of cerebral thrombosis secondary to neurborreliosis are rarely found in the literature. We intend to present two clinical cases with these particular aspects.

Keywords: Lyme borreliosis; Dermatomyositis; Cerebral thrombosis; Clinical presentations; Lyme disease; Diagnostic

INTRODUCTION

Lyme disease is triggered by *Borreliaburgdorferisensustricto* (the only pathogenic species in the US) [1], *B. spielmanii, B.afzelii* and *B.garinii* (species identified in Europe), and represents a multisystemic tick-borne disease transmitted by ticks from the Ixodes genus. In addition, there are other species involved in the disease in certain geographical areas: *B. americana, B. andersons, B. bavariensis* (*B. garinii*OspA serotype 4), *B. bisettii* [2], *B. lonestar* [3], *B. valaisiana, B. kurtenbachii,* and *B. crocidurae* [4], isolated from patients with Lyme-like disease clinical picture. Recently has been identified a Lyme-like disease, described for the first time in 2007 in Russia [5], caused by *Borreliamiyamotoi*phylogenetic similar, [6,7] but also described in the US in 2013 [8,9] in endemic areas of Lyme disease, suggesting the need to asses also for this ethology febrile patients with deer ticks bites. It is estimated a number of 20-100 cases per 100000 inhabitants in North America and around 100-130 cases per 100000 inhabitants in Europe.

B burgdorferi being present in the central nervous system adheres to the cellular endothelium, having a neurotoxic action, and induces the release of proinflammatory cytokines [10]. In neuroborreliosis pathogenesis, CXCL13 chemokines synthesized by the monocytes under the influence of TLR2 after their penetration in the cerebrospinal fluid [11], appear to have an important role, also their level is increased in neurosyphilis.

B burgdorferi possess mechanisms to evade the body's defense system, being able to resist the action of TLR2, CD14, complement, and anti OspA or OspC antibodies, namely: reducing the expression of surface proteins, inactivates the effector mechanisms, it concentrates in the extracellular matrix, and so on.

CLINICAL PICTURE

Lyme disease develops in three stages: stage 1 or localized Lyme disease, stage 2 or disseminated infection and stage 3 or persistent infection, without a clear separation between the last two. Stage 3 occurs in the first year after infection.

Stage 1 is represented by the *erythema chronicummigrans* centered on the tick bite, with an increasing trend through the margins, with central fading, painless, sometimes itchy, with a diameter of at least 5 cm, with a round or oval shape, rarely triangular or in linear shape, and occurs after 3-30 days after the tick bite. The most common locations are: armpits, lower abdomen or gluteal regions, popliteal space and the cervical region. Even without treatment, the erythema may disappear in 2-3 weeks; in 20% of cases the recurrence of the lesions is possible or the presence of multiple elements produced by haematogenous dissemination. Approximately 2/3 of patients passing through stage 1 will present clinical manifestations of stage 2 or 3, at least.

Other manifestations of the first stage without erythema migrans are: mild fever, myalgia, arthralgia, headache or neck stiffness, digestive symptoms, lymph nodes located in the vicinity

of the tick bite, exceptionally eye (conjunctivitis, photophobia) or respiratory involvement. The presence of general sever symptoms, suggests the coinfection with *Babesia* or *Erlichia* spp.

For the patients with infection caused by *B. miyamotoi*, symptoms often associate fever, myalgia, rash, headache, suggesting rather human anaplasmosis infection. Among laboratory changes thrombocytopenia, elevated liver enzymes, and leucopenia are found. Chronic or cases with sequels are not described.

Stage 2 of Lyme disease develops after 1-3 months after the initial infections and is the result of the haematogenous or lymphatic dissemination of *Borreliei*, most commonly being affected the musculoskeletal system, the nervous system and the heart.

Most commonly are **musculoskeletalmanifestations,** common in Europe, described as symmetrical arthritis or arthralgia, localized at the large joints (knees, elbows, shoulders) but may occur also in small joints or temporomandibular joint, or sacroiliac joint. In the absence of treatment, relapses are possible, less severe compared to the initial episode, which usually affect only one joint.

The **neurological manifestations** of stage 2 of the disease are represented by cranial nerve palsy, the most common being facial nerve palsy, unilateral or bilateral, in 1 of 3 cases [12], especially in children [13]. There is also described radiculopathy associated with general symptoms like: arthralgia, myalgia and fatigue. In Europe most commonly found is the peripheral nervous system involvement as painful radiculitis with sensory, motor or mixed symptoms. Less frequently severe symptoms such as diffuse polyneuropathy that imitates Guillain-Barre syndrome are identified and axonal neuropathy.

The meningitis in the stage 2 of Lyme disease is a lymphocytic one with low cellularity, a slight increase of proteins, and normal or slightly increased levels of cerebrospinal fluid glucoseand evolving in mild to severe forms.

The **encephalopathy** in Lyme disease, is characterized by mild confusion, memory, concentration, or personality impairment, sometimes depression and irritability, and occurs months or years after infection.

Cardiac manifestations of stage 2 are represented by the grade I, II and also III atrioventricular block, and myopericarditis, rarely cardiac tamponade, with a limited duration of one week. Grade III blocks may require electrical pacing.

Cutaneous manifestations of this stage are multiple elements of erythema migrans, or borreliallymphocytoma, localized at the ear lobe (especially in children) or at the mammary areola (in adult); rarely described on the extremities, scrotum or nose.

Ocular manifestations of stage 2 are represented by papilledema, optic neuritis, unilateral or bilateral, especially in children [14], optic atrophyorpseudo tumorcerebri.

In stage 3 of Lyme disease, neurological and rheumatological manifestations occur, months or years away from the initial infected, in Europe also being described acrodermatitischronicaatrophicans.

Neurological manifestations could be either peripheral or central.

Chronic Lyme encephalopathy, rarely associated in North America, more commonly described in Europe, is hard to be diagnosed after a long period of time after the infection, no clinical or imagistic elements are evocative for neuroborreliosis - MRI aspects suggest either a brain stem injury or a cerebrovascular ischemia. It is associated with memory and attention impairment, emotional lability, sleep disorders in 15% of cases [15,16], psychosis [17], schizophrenia [18], hearing or visual hallucinations [17,19].

Meningo-vascular Lyme neuroborreliosis evolves with secondary cerebral infarcts [20], through inflammatory cell infiltration, adventitia fibrosis, intima proliferation in lumen and complete arterial obstruction by thrombus, brain stem infarction. A second form of chronic Lyme neuroborreliosis is chronic **Lyme meningoencephalomyelitis/ meningoencephalitis** that can evolve as infiltrative or atrophic type. In the infiltrative type, from a pathogenic point of view there is an important cellular immune response, perivascular lymphocytic infiltrate, microglial reaction and vasculitis; in some cases multiple periventricular demyelinating areas are described. The atrophic form is dominated by cognitive decline, dementia and subacute presenile dementia [21,22], predominantly fron to temporal cerebral atrophy evidenced by neuro imaging [23], neural destructions [24], and microglia and astrocyte proliferation.

Other manifestations in the chronic stage are: transverse myelitis and radiculoneuritis. After Lyme disease cognitive and psychiatric symptoms may persist, without the possibility of establishing the presence of the infection in the CNS and without any benefits after applying the antibiotic treatment again.

Among the manifestations of meningoencephalitis in stage 3of Lyme disease are discribed: seizures, hemiplegia, ataxia, hearing impairment, progressive facial hemiatrophy; myelit is from the late stage in half of the cases is associated with spastic paraparesisortetraparesis.

Acrodermatitischronicaatrophicans, with an initial aspect of fading and inflammation, and then skin atrophy, is localized in the dorsal aspect of the foot, also on the hands, elbows and knees.

Ocular manifestations that may occur in stage 3 (and also in the late second stage) are most commonly represented by episcleritis, iritis, keratitis, uveitis, vitreous inflammation, retinal detachments, retinal vasculitis, chorioretinitis, and macular edema.

The severity of Lyme disease progression appears to be associated also with the underlying diseases, the genetic predisposing factors described, different aspects regarding the immunity, the presence of autoimmune factors [24] or comorbidities [25].

DIAGNOSIS

Diagnostic difficulties are justified by the lack of recognition of the time of the bitein about 64% of cases of Lyme disease in Europe, and in 25-30% of cases in the United States. In endemic areas, at people that work in forestry or live in rural areas, or persons that conduct professional or recreation alactivity in wooded areas, erythemamigrans is found at the end spring and in summer, and in Europe reinfection being possible with different species.

Erythema migrans can be confused with Southern Tick-Associated Rash Illness **(STARI)**, or Master disease or with skin hypersensitivity to tick bites, frequently below 5 cm in diameter and with lesion disappearance in a few days, or with contact dermatitis or granuloma annulare.

Through the symptomatic pleiomorphism [26], Lyme disease is suitable for the differential diagnosis with other chronic inflammatory diseases, degenerative diseases, autoimmune diseases, psychosomatic disorders [27], gout, fibromyalgia, the difficulty of diagnosis being motivated both by not knowing the moment of the tick bite and of the erythema migrans.

LABORATORY EXAMINATIONS

At suspicion of Lyme disease, are performed tests like Enzyme Immunoassays **(EIA)** and Enzyme-Linked Immunosorbent Assay **(ELISA)** of anti *B burgdorferi immunoglobulins* M and G (IgM and IgG) antibodies, which are completed for equivocal or positive with Western blot, the detection of both types of antibodies for the presence of symptoms up to 30 days respectively IgG Western blot for symptoms over 30 days. In Europe C6 peptide testing is recommended, test that is more accurately for *B burgdorferi*, easier and less expensive to differentiate from other species. Western blot examination is performed also from the cerebrospinal fluid at patients with central nervous impairment. Examination of articular fluid is important for the exclusion of other etiologies and but also for the confirmation of the presence of specific antibodies at this level. For cases that associate heart impairment, are complementary evaluated by electrocardiogram, and echocardiography in case of myopericarditis.

Antibody against *B. miyamotoi*GlpQ [28] or Polymerase Chain Reaction **(PCR)** is current methods of diagnosis of infection with *B. miyamotoi.*

TREATMENT

Lyme disease management consists of an appropriate therapy of the stage of the disease, influenced by the age of the patient, presence of allergies or by the persistence of the symptoms.

For patients over 8 years of age, in stage 1 of the disease there is prescribed one of the fallowing option: doxycycline, amoxicillin, or cefuroxime axetil; under 8 years old, doxycycline represents a contraindication. Duration of treatment is 2-4 weeks.

In stage 2 of Lyme disease, for the involvement of the joints it can also be prescribed oral therapy as in the first stage, for a period of 28 days, with a switch to parenteral antibiotics for

nonresponsive cases or in case of recurrence of symptoms, amoxicillin 4-6 g/day, ceftriaxone 2g/day or cefotaxime 6 g/day are being preferred, associated with nonsteroidal anti-inflammatory drugsor hydroxychloroquine. For patients with heart involvement is recommended either oral or parenteral therapy in similar doses, for a period of 14-21 days.

Cases of neuroborreliosis, in anearly disseminating stage (memingo-radiculo-neuritis, meningitis) are treated parenterally for 14-21 days. In the late stage of neurological impairment,a therapy with benzylpenicillin (penicillin G),18-24 million units/day, ceftriaxone or cefotaxime for 14-28 days can be prescribed. Articular recurrences in the late-stage can be addressed orally or parenterally for 28 days. Acrodermatitis chronic atrophicansis suitable for an oral treatment with duration of 14-28 days.

In case of suspicion of infection with *B. miyamotoi,*doxycycline is treatment of choice, also beingactive on both in case of Lyme disease and on human granulocytic anaplasmosis, coinfection being also possible.

CASE PRESENTATIONS

The Association of Lyme disease with Dermatomyositis

The association of Lyme disease with dermatomyositis is rarely found in the literature [29-32] mostly present in the chronic Lyme disease stage [33,34].

Dermatomyositis is a myopathic inflammatory disease, accompanied by specific skin lesions, with or without joint, esophageal or pulmonary and, exceptionally, cardiac involvement.

The diagnosis criteria of dermatomyositis were uttered by Bohan and Peter in 1975.

- Symmetrical hypotonia of the belt muscles, of the extremities and of the neck, which is progressive over weeks and even months, with or without dysphagia or the involvement of the respiratory muscles.

- Aspect of myositis and muscular necrosis during the muscular biopsy.

- Increased level of muscular enzymes in the serum.

- Myositis electromyographic alterations.

- Presence of skin lesions, including a mauve colouring with a peri-orbital edema, erythematosus dermatitis on the back of the hand, especially at the level of the metacarpal-phalanx and proximal inter-phalanx joints (the Gottron sign), but also on the knees, face, neck and upper thorax.

The dermatomyositis diagnosis is certain/valid when the skin signs are associated with other three criteria presented above.

The two authors identified 5 sub-types of dermatomyositis: dermatomyositis, polymyositis, myositis associated with neoplasia, juvenile dermatomyositis/polymyositis and myositis

associated with other collagen diseases. In some cases, the tegumentary involvement is not associated with the muscular one (situation known as Amyopathic Dermatomyositis **(ADM)** or dermatomyositis sine myositis) or myopathy is controlled while the tegumentum is still affected (postmyopathic dermatomyositis).

From a physiopathological point of view, dermatomyositis presents a vascular inflammatory reaction, at the level of the muscular capillaries and small arterioles, as a result of deposits of C5-b-9 complement and Membrane Attack Complex **(MAC),** at the level of the vascular endomysium, which triggers an immediate humoral immune reaction, presenting B cells but also CD4 cells. Consequent to the destruction of the capillaries, there will be micro-infarcts at the muscular level and, in the case of more advanced phases, necrotic and degenerative lesions.

Rarely is a familial aggregation of dermatomyositis possible, when dealing with HLA DR3, DR5, DR7 persons, with polymorphism of the tumoral necrotic factor – the presence of the 308A allele. Different types of infections are also possible, as triggers of dermatomyositis: viruses (parvoviruses, enteroviruses – Echo, Coxsackie, HTLV- human T-cell lymphotropic virus type 1, HIV), bacteria (Borreliaburgdorferi), Toxoplasma etc.

The therapy of dermatomyositis imposes using cortico-therapy, immunosuppressive agents, antimalarial agents, methotrexate, mycophenolate mofetil, immunoglobulins and rituximab.

We are going to present a case of Lyme disease, which precipitated the appearance of dermatomyositis – an extremely rare situation mentioned in literature.

Case presentation

A 50 year-old patient, known as having total hysterectomy with bilateral anexectomy, chronic ischemic heart disease and hypertension under treatment, is committed two months subsequent to a tick bite, having fever, shivers, myalgia, paresthesia, motor deficit of the lower and upper limbs, nausea, capricious appetite, significant weight loss (10 kg within the last two months), dizziness and memory disorders. We mention the presence of migratory erythema one week after the tick bite, which was treated with doxycycline for 14 days (200mg/day). This is what the objective examination revealed to us when the patient was committed: bad general condition, pale dry teguments, hypotonic and hypo-kinetic muscular tissues, impossibility of maintaining orthostatism, normally shaped tho¬rax participating symmetrically in the respiratory movements, respiratory frequency 24//min, bilateral coarse vesicular murmur, basal bilateral crackles, HR 74/min, BP 120/70 mmHg, rhythmic cardiac noises, clearly beaten, flexible, elastic abdomen, painful on deep palpation in the right hypochondria, liver in normal range, impalpable spleen, temporospatially oriented, no neck stiffness, cranial nerves – normal relations, osteo-tendinous reflexes globally diminished, Achilles reflexes totally abolished (tetraparesis with predominant paraparesis), balance difficulties.

The **laboratory tests** revealed the following: WBC=8540/mm^3, RBC=3,87mil/mm^3, Hemoglobin=12g/dl, Hematocrit=38,7%, VCM=100fl, MCH=31pg, MCHC=31g/dl, Platelet=204000/mm^3, Neutrophils=58,9%, Eosinophils=0,4%, Monocytes=5,3%, Lymphocytes=32,7%, Basophils=2,7%, ESR=87mm/h, Fibrinogen=472,3mg/dl, CRP=7,7mg/l, Glycemia =74mg/dl, urea=38mg/dl, creatinine=0,65mg/dl, ASAT=57U/l, ALAT=37U/l, GGT=258U/l, amylase=58U/l, total bilirubin=0,71mg/dl, total proteinTP=6,7g/dl, Cholesterol =276mg/dl, triglycerides TG=201mg/dl, creatine phosphokinase 2600 u/l, IgA=118mg/dl, IgG=1250mg/dl, IgM=244mg/dl, serum complement fraction C3=125mg/dl, serum complement fraction C4=30mg/dl, Na^+=138mEq/l, K^+=3,42mEq/l, Ca^{2+}=4,3mEq/l, Mg^{2+}=1,39mEq/l.

Lumbar puncture was performed revealing a clear cerebrospinal fluid CRF, slightly hypertensive. CRF examination: Elements 5/mm^3, Pandy reaction negative, Glucose =50 mg/dl, Protein =0.38g/ dl; the bacteriological examination did not reveal any germs in the cultivated media; Gram stain: rare lymphocytes and epithelia. A sample was sent for the Western blot of CRF to be run for *Borrelia* – IgM negative and IgG positive. IgM in the serum for Borreliaspp was 84 u/l.

Pulmonary radiography: generally accentuated pulmonary interstice, micro-nodular images emphasized at the level of both pulmonary areas – nodular, tending to become confluent in the inferior pulmonary areas. Cerebral MRI – normal aspect.

Electromyography revealed an aspect of motor axonal polyneuropathy. The cutaneous biopsy suggests an aspect of dermatomyositis.

The differential diagnosis matter resulted in the exclusion of the following:

- Multiple sclerosis – clinically, the patient evolution with muscular hypotonia, motor coordination disorders, extremity paresthesia, vertigo, cognitive disorders – excluded consequent to the imagistic examinations and the neurological examination.
- Fibromyalgia – neurosensory disease characterized in part by the anomalies of the central nervous system in processing the pain; it implies certain elements of vulnerability: female gender, genetic inheritance, environmental factors. Clinically, it manifests itself by muscular diffuse pain, which lasts for at least three months, pain in the large joints and belts, paresthesia, migraines, cognitive difficulties frequently accompanied by multiple inexplicable organic symptoms, sleeping disorders, symptoms which are worsened under stress, anxiety and physical effort. The MRI reveals a reduced sanguine flow in the thalamus and the basal ganglions.
- Acute polyradiculoneuropathy –showing a general worsened condition, respiratory and gastro-intestinal manifestations associated with motor deficit located both proximally and distally, which progresses rapidly towards tetraplegia, sensitivity disorders.
- Polyneuropathies of other etiologies – metabolic, toxic and neoplastic.

- Endocrine myopathies of hypothyroidism, hyperthyroidism, Cushing's syndrome, Addison's disease. The muscular weakness present in these endocrine diseases is not accompanied by the increase in the serum enzymes of muscular origin.
- Infectious myopathies of infections caused by the Coxsackie, ECHO and influenza viruses – without epidemiological context or any clinical background.

Dermatomyositis was sustained by cutaneous aspects - a mauve coloring with an orbital edema and by telangiectasia, peri-nail coloring, and muscular weakness of the upper and lower limbs, myalgia, and increase of CPK, electromyographic alterations, myositis and inflammatory syndrome. The pulmonary involvement could also have been associated with dermatomyositis, but the clinical evolution under antibiotic therapy eventually excluded this association.

A hygienic and dietetic treatment was established – ceftriaxone 4mg/day for 21 days, antifungal, corticotherapy for dermatomyositis under proton pump inhibitors protection, vasodilators. Presently the patient is under treatment with immunosuppressive agents, as the corticosteroid therapy did not have a favorable influence on the evolution of dermatomyositis; furthermore, it associated with the insulin-needing cortisone mellitus diabetes and Cushing's syndrome.

There are only 10 other cases described in the literature, in which Lyme disease triggers der-matomyositis; the case presented above stands out because of the short period of time (two months) between the debut of Lyme disease and the confirmation of dermatomyositis, in the case of a patient treated with doxycycline, in accordance with the initial stage of the Lyme disease.

The Association of Lyme Disease with Thrombophilia

Chronic Lyme disease is associated with hypercoagulability, with increasing fibrinogen, fibrin and coagulation factor II (prothrombin) and thrombin/antithrombin complexes. Pairing chronic Lyme disease with hereditary hyper-coagulability, predisposes in addition to blood clotting. We present the case of a patient with thrombophilia and neuro- borreliosis, whose hypercoagulable state was diagnosed in the course of the chronic infection.

Case presentation

We present the case of a 45-years-old Caucasian woman, pharmacist assistant by profession, with a history of duodenal ulcer (1990) and a miscarriage, who at admission presented occipital headache and vision changes that were reported like bilateral amputation of lower visual field. Symptoms with an onset 1 month prior to her presentation in the emergency room, where a cranial Computerized Tomography **(CT)** scan was performed in order to exclude an acute intracranial pathology. The conclusion of the CT scan was: minimal maxillary sinus mucosal thickening and right sphenoid sinus retention cyst. The patient was evaluated by an otorhinolaryngologist, the association between the headache and an ear, nose, and throat condition being excluded. The patient continues to experience headaches, reports visual changes and image distortion, becomes agitated, being diagnosed with anxiety and is treated as an outpatient with anxiolytics. 30 days

after the onset vomiting occurs, the visual changes are emphasized and blindness is present and resolves spontaneously after 24 hours, symptoms for which she is admitted to the Infectious Diseases Department. Neurologic examination and physical examination were unremarkable: afebrile, without signs of meningeal irritation, symmetrical light reaction pupils, without motor deficit, except for osteotendinous hyperreflexia and right Babinski reflex in flexion.

Laboratory examinations revealed the following alterations: a thrombocytopenia of 116.000/ mm^3, alanine aminotransferase 78U/L (references values 20 to 43), aspartate aminotransferase 44U/L (reference values 20 to 40), International Normalized Ratio **(INR)** of 1.64, Quick`s tine of 19.8 seconds; viral hepatitis B, C, HIV, herpes simplex virus type 1 and type 2, cytomegalovirus and the Epstein-Barr virus infections are excluded as well as the collagen disease, the thyroid disease, syphilis, tuberculosis and toxoplasmosis. The Cerebrospinal Fluid **(CSF)** studies were within normal values. The cranial CT scan was performed again and revealed occipito-parietal lacunar and hypodense lesions with gyrus hyperdensity after intravenous contrast agent was injected, without other parenchymal injuries; the conclusion were: bilateral occipito-parietal subacute and chronic ischemia. A cranial Magnetic Resonance Imaging **(MRI)** was performed and the findings were: bilaterally occipital hyperintensities FLAIR changes with temporal extension, affecting the white and gray matter, and marked peri-gyrus hypervascularization after i.v administration of contrast agent. The conclusion of the MRI was: bilateral occipital encephalitis, with left temporal extension. The patient is investigated from a hematological point of view: a thrombophilia is confirmed (Factor V Leiden mutation, mutation of Methylene Tetra Hydro Folate Reductase **(MTHFR)** C677T – positive) and a treatment with anti-clotting medication was initiated with Low Molecular Weight Heparin **(LMWH)**, enoxaparin sodium.

Because the patient reports a tick bite five years ago without erythema migrans, she is investigated also for borreliosis; Immunoglobulin **(Ig)** G ELISA positive test, Western blot analyses for Lyme IgG being positive from both serum and CSF. Chemokine (C-X-C motif) ligand 3 (CXCL3) detection was not performed.

Her evolution was favorable under treatment with ceftriaxone 2g/day for 21 days, anti-clotting medication, with improved visual field that still remains decreased, at discharge a treatment with doxycycline is recommended 2x100mg/gay for the next 60 days.

Through the symptomatic pleiomorphism [26], Lyme disease is suitable for the differential diagnosis with other chronic inflammatory diseases, degenerative diseases, autoimmune diseases, psychosomatic disorders [35], the difficulty of diagnosis being motivated both by not knowing the moment of the tick bite and of the erythema migrans (at 30% of cases). The therapeutic response of late neurological manifestations forms are really good at oral therapy with doxycycline [36].

CONCLUSIONS

The presented case is of a patient with unidentified thrombophilia (Factor V Leiden positive mutation, mutation of MTHFR C677T - positive) until now, the emergence of the neurological manifestations, with a miscarriage, for which she was not investigated in terms of a hematological disorder on that particular occasion. Heterozygous mutations of factor V Leiden are associated with a more increased risk of thrombosis held between 20-35 times higher than the general population. Our patient clinical picture is due to the combination of coagulation activation by Borrelia infection in a patient with a hereditary predisposition. The presence of hypoprothrombinemia, thrombocytopenia was most likely associated with antiprothrombin antibodies or Antiphospholipid Antibodies **(aPL)**, which were tested later and explain the presence of thrombosis. MTHFR 677 is more often associated with early heart disease and stroke. Pairing this hereditary predisposition with borreliosis causes the brain thrombosis, unusual manifestations of reversible blindness and amputation of the vision field, rarely cited in the literature.

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