



Understanding the Lyme Disease, Classification and Codes

Jose Lapenta*

Department of Dermatology and Post graduated from University of Carabobo, Venezuela

*Corresponding author: Jose Lapenta, Department of Dermatology and Post graduated from Carabobo University, Researcher, Venezuela; Website: www.dermagicexpress.blogspot.com

Abstract

Hello friends of the network dermagic brings you today another interesting topic about the very well known erythema migrans or lyme disease, transmitted by the bite of a tick, of the *ixodes* genus being the causal agent an *espirochete*, well known as *borrelia burgdorferi*, described for the first time by willy *burgdorfer* in the year 1981, and previously known as lyme arthritis. Today I bring you the codes of lyme's disease.

Received date: December 24, 2017

Accepted date: January 04, 2018

Published date: January 12, 2018

Citation: Lapenta, J. Understanding the Lyme disease, Classification and Codes. (2018) Invest Dermatol Venereol Res 4(1): 1- 11.

DOI: 10.15436/2381-0858.18.1769

Introduction

Currently worldwide lyme disease has become a major public health problem, due to the annual increase in cases, which in the United States amounts to about 380,000, new cases annually, 2 times more than breast cancer and 6 times more than aids, and beyond this, the lack of modernization of the disease codes at the software or digital level, them do not appear currently and they need to be recognized so that patients to be and treated in time. The events that I present below they are highly related to this lack of "CODIFICATION" of the Lyme disease and its different ways of manifesting itself clinically:

Difficulty to make the diagnosis:

It is well known that some test, to diagnose the disease, result in "NEGATIVE" due to the ability of the causative agent, the *spirochaete borrelia* to "hide (Biofilm) before the diagnostic tests" Many patients with symptoms of different diseases such as meningitis, arthritis, and recurrent fever, in late stages it is discovered that they are lyme "positive" after having multiple tests for the diagnosis, losing a valuable time to initiate an adequate treatment, and the worse thing is that the chronic development of these symptoms, impar the quality of life of patients who are unattended because they do not have a specific diagnosis.

Resistance to conventional treatment:

Another aspect to consider is that *borrelia* and its species over time have developed a "great resistance" to conventional therapy with the usual antibiotic treatments: minocycline, doxycycline, amoxicillin, cefuroxime, and many others, leading

patients to the despair at the occurrence of the codification of the symptoms. LYME disease has four stages classically known: Initial (I), Secondary (II), Late (III) Chronic (IV).

The lack of modernization of the codes for the Lyme disease:

In this modern and globalized world, digitalization and information technology have become essential elements and everything or almost everything has a code, even diseases at the software level, and in the case of lyme disease these must be updated, and this is done based on the evidence reports, studies and publications of the different manifestations of the disease.

Then you will be asking why the Lyme disease needs the update of its codes? If you enter in the World Health Organization (WHO) and look for lyme disease, you will only find two (2) mentions in the subject ZOONOSES, transmission by ticks: lyme disease and recurrent fever (*borreliosis*), and the latest relevant reports in terms of studies of the disease by WHO date from the years 1993 and 1995:

- WHO Workshop on Diagnosis and Surveillance of Lyme Borreliosis. Warsaw, Poland, 20 - 22 June 1995, Ref.: WHO / CDS / VPH / 95.141:
- The countries involved were: Austria, Bulgaria, Czech Republic, Denmark, Yugoslavia, France, Hungary, Ireland, Japan, Holland, Poland, Russia, Sweden, Switzerland, United Kingdom and the United States.
- Report of a WHO Workshop on Lyme *borreliosis*. Piestany, Slovak Republic, 6 October 1993, Ref: WHO / CDS / VPH / 93.132:



The countries involved: Germany, Slovakia and the United States. If you read those reports you will notice that they are totally out of date regarding the reality of Lyme disease today.

And I will always give you the answer.

I will place here more than 276 bibliography references classified based on the different manifestations of lyme disease or lyme borreliosis that are sufficient to recognize that beyond "Lyme Disease" and recurrent fever (*Borreliosis*) there are other manifestations of the *borreliosis* that should be codified, digitalized, to give a total coverage to the disease and search of its clinical manifestations.

This "Absence" of codes causes that many patients carrying lyme are not treated adequately, because they do not "Appear in the system" with their respective consequences.

Here I ask the innocent question, what happens is "Unknown" or "Intentioned"? Because to recognize all these IMPLIED CODES means more public spending by the State and the insurance companies.

1) Congenital Lyme Disease: Potential infection of the foetus with possibility of death^[1-15]:

- Lyme *borreliosis* in pregnant women.
- *Erlchiosis* and *Borreliosis* in Pregnant Women.
- The Infectious Origins of Stillbirth.
- Intrauterine Transmission of *Borrelia Burgdorferi* in dogs.

2) Lyme Disease: Primary Infection^[16-20]:

- Newborn dead woman pregnant with Lyme disease.
- Lyme *borreliosis*, implication for the foetus.
- Fetal *borreliosis*, texemia of pregnancy and fetal death.
- Eritema migrans in pregnancy.
- Fetal maternal transmission of lyme disease.
- *Borrelia burdogferi* in newborn.

A.) Primary infection and erythema migrans.

- Primary and secondary erythema migrans.

B.) Primary seronegative infection^[21-26].

- Negative antigens against *borrelia burdogferi* in cerebrospinal fluid in neurologic lyme disease.
- Seronegative Lyme disease.
- Seronegative chronic relapsing *neuroborreliosis*.

3.) Lyme disease, persistent infection in secondary and late stage^[27-30].

- Persistent infection with antibiotics doxycyline and amoxicillin.
- Isolation of *borrelia burdogferi* from ocular iris.
- Survival of *borrelia burdogferi* after therapy with antibiotic.

4.) Lyme disease, persistent infection in secondary and late stage^[31-40]:

A.) Cutaneous Manifestations:

- Borrelial Lymphocytoma (BL).
- Acrodermatitis atrophicans^[41-45].
- Annulare granuloma^[46-48].
- Morphea^[49-51].

- Localized scleroderma^[52-54].

- Lichen sclerosus and atrophicus^[55-57].

B.) Other Cutaneous manifestations^[58-62]:

- Benign lymphocytic infiltration of jessner kanof.
- Infantile acrodermatitis of gianotti-crosti.
- Atypical erythema multiforme.
- Urticarial vasculitis.

5.) Lyme disease of skin and mucous membranes^[63-65]:

- Association of Lyme disease with morgellons disease.
- Difusse alopecia^[66-69].
- Scleroderma in cup de sabre.
- Pseudopelade of brocq.

6.) Lyme disease and other lesions^[70-72]:

- Anetoderma.
- Primary and secondary erythema migrans in children.

7.) Lyme disease late stage: meningitis, oculoopathy, iridocyclitis, iritis, uveitis^[73-83].

A.) Lyme Meningitis.

B.) Lyme Oculoopathy.

C.) Lyme Iridocyclitis, Iritis and Uveitis.

8.) Lyme disease secondary and late stage: Nephritis, Hepatitis, Lymphadenopathy, Myositis and Other^[84-107].

A.) Lyme Nephritis.

B.) Lyme Hepatitis.

C.) Lyme Lymphadenopathy.

D.) Lyme Myositis.

E.) Other Conditions:

- Perplexing Symptoms.

- Pancytopenia.

- Eye Symptoms.

9.) Lyme disease late stage and cardiovascular disease^[108-128].

A.) Aortic Aneurysm.

B.) Aneurysm of Coronary Arteries.

C.) Late Endocarditis.

D.) Carditis.

E.) Atrioventricular Block.

10.) Lyme disease late stage, neuro-*borreliosis*, neuritis or neuropathy, meningovascular, nb with cerebral infarcts, lyme Parkinsonism, lyme encephalitis^[129-182].

A.) Neuro *Borreliosis* (NB) Late Symptoms.

B.) Neuritis or Late Neuropathy.

C.) Neuro *Borreliosis* (NB) Meningovascular with Cerebral Infarcts.

D.) Intracranial Aneurysm.

E.) Parkinsonism.

F.) Late Encephalitis.

G.) Stroke due to Neuro *borreliosis*.

H.) Neuro *Borreliosis* (NB) Unspecific Symptoms:

- Late Lyme disease (Neuro *Borreliosis*: Comparison and Evidence of the *Spirochetes* and late *Neurosyphilis*.

- Evidence between the infection of *spirochetes* and Alzheimer's

disease.

11.) **Lyme Disease:** Neuro borreliosis, Late Lyme Meningoencephalitis or Meningomyeloencephalitis^[183-212].

12.) **Lyme Disease Late Stage:** Atrophic form of Meningoencephalitis with Dementia, Subacute presenile dementia and neuropsychiatric manifestations^[213-243].

13.) **Lyme Disease: Late Stage:** Bone, Joint and Musculoskeletal Manifestations^[244-252]

14.) Lyme Disease, Late Stage: Oculopathy, Liver, Kidney and respiratory manifestations^[253-267].

A.) Oculopathy.

B.) Liver and other viscera.

C.) Kidney and ureter.

D.) Bronchia and Lungs.

15.) Lyme Disease, Latent Stage, Unspecified^[268-281].

A.) Infection of the Central Nervous System.

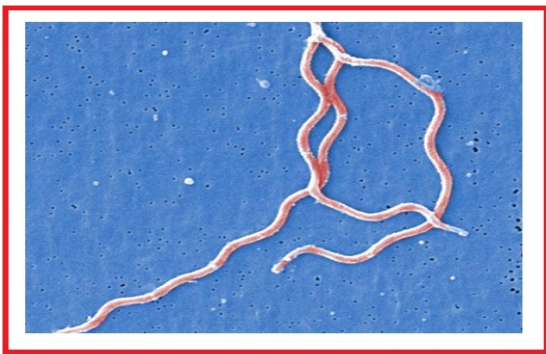
B.) Simple Herpes Type 1.

C.) Diseases by Spirochetes of the Central Nervous System.

This classification that you have just read is a summary of the 276 bibliographic references that I describe below which you can find in the best scientific databases such as Pubmed, Medscape, Lilacs etc, if you have some doubt copy and paste of any of them, put it in your browser and you will get the exact information on the mentioned databases.

BORRELIA BURGENDORFERI

Center For Disease Prevention and Control



DERMAGIC - EXPRESS - MARACAY VENEZUELA

Conclusion

As you can see, there are enough evidences, to update the codes of Lyme disease in all the databases systems of the planet, to give a total coverage to the diagnosis and treatment of this disease that in my particular way of seeing is becoming the new plague of the 21st century. But this does not end here, suddenly you think that some details are missing, some or several questions, which I will explain in the next edition: Lyme's Disease, *Syphilis* and Leprosy, the missing link.

Do not miss it!!!

References

- Bale, J.F. Jr., Murph, J.R. Congenital infections and the nervous system. (1992) *Pediatr Clin North Am* 39(4): 669–690.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Brzostek, T. Human granulocytic ehrlichiosis co-incident with Lyme borreliosis in pregnant woman--a case study. *Przegl Epidemiol* (2004) 58(2): 289–294.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Gardner, T. Lyme disease. In: Remington JS, Klein JO, eds. *Infectious Diseases of the Foetus and Newborn*. (1995) 5th ed. Philadelphia: Saunders 447–528.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Goldenberg, R.L., Thompson, C. The infectious origins of stillbirth. (2003) *Am J Obstet Gynecol*. 189(3): 861–873.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Gustafson, J.M., Burgess, E.C., Wachal, M.D., et al. Intrauterine transmission of *Borrelia burgdorferi* in dogs. (1993) *Am J Vet Res* 54(6): 882–890.
[Pubmed](#) | [Crossref](#) | [Others](#)
- MacDonald, A.B., Benach, J.L., Burgdorfer, W. Stillbirth following maternal Lyme disease. (1987) *N Y State J Med* 87(11): 615–616.
[Pubmed](#) | [Crossref](#) | [Others](#)
- MacDonald, A.B. Gestational Lyme borreliosis. Implications for the foetus. (1989) *Rheum Dis Clin North Am* 15(4): 657–677.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Macdonald, A.B. Human fetal borreliosis, toxemia of pregnancy, and fetal death. *Zentralblatt für Bakteriologie, Mikrobiologie und Hygiene. Series A: Medical Microbiology, Infectious Diseases, Virology, Parasitology* (1986) 263(1-2): 189–200.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Maraspin, V., Cimperman, J., Lotric-Furlan, S., et al. Erythema migrans in pregnancy. (2000) *Wien klin Wochenschr* 111: 933–940.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Markowitz, L.E., Steere, A.C., Benach, J.L., et al. Lyme disease during pregnancy. (1986) *JAMA: J Am Med Asso* 255(24): 3394.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Schlesinger, P.A., Duray, P.H., Burke, B.A., et al. Maternal-fetal transmission of the Lyme disease Spirochete, *Borrelia burgdorferi*. (1985) *Ann Inter Med* 103(1): 67.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Silver, R.M., Yang, L., Daynes, R.A., et al. Fetal outcome in Murine Lyme disease. (1995) *Infect Immu* 63(1): 66–72.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Strobino, B.A., Williams, C.L., Abid, S., et al. Lyme disease and pregnancy outcome: A prospective s of two thousand prenatal patients. (1993) *Am J Obstet Gynecol* 169(2): 367–374.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Weber, K., Bratzke, H.J., Neubert, U., et al. *Borrelia burgdorferi* in a newborn despite oral penicillin for Lyme borreliosis during pregnancy. (1988) *Pediatr Infect Dis J* 7(4): 286–288.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Christova, I., Komitova, R. Clinical and epidemiological features of Lyme borreliosis in Bulgaria. (2004) *Wien Klin Wochenschr* 116(1-2): 42–46.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Hercogová, J., Tománková, M., Barták, P. Contributions to the treatment of dermatologic manifestations of Lyme borreliosis. (1992) *Cutis* 49(6): 409–411.
[Pubmed](#) | [Crossref](#) | [Others](#)
- Lipsker, D., Hansmann, Y., Limbach, F., et al. Disease expression of Lyme borreliosis in north-eastern France. (2001) *Eur J Clin Microbiol Infect Dis* 20(4): 225–230.
[Pubmed](#) | [Crossref](#) | [Others](#)

- 18) Melski, J.W., Reed, K.D., Mitchell, P.D., et al. Primary and secondary erythema migrans in central Wisconsin. (1993) *Arch Dermatol* 129(6): 709-716.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 19) Schmid, G.P. Epidemiology and clinical similarities of human spirochetal diseases. (1989) *Rev Infect Dis* 6: S1460-S1469.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 20) Coyle, P.K., Deng, Z., Schutzer, S.E., et al. Detection of *Borrelia burgdorferi* antigens in cerebrospinal fluid. (1993) *Neurology* 43(6): 1093-1098.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 21) Coyle, P.K., Schutzer, S.E., Deng, Z., et al. Detection of *Borrelia burgdorferi*-specific antigen in antibody-negative cerebrospinal fluid in neurologic Lyme disease. (1995) *Neurology* 45(11): 2010-2015.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 22) Dattwyler, R.J., Volkman, D.J., Luft, B.J., et al. Seronegative Lyme disease. Dissociation of T- and B-Lymphocyte Responses to *Borrelia burgdorferi*. (1988) *N Engl J Med* 319: 1441-1446.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 23) Holak, H., Holak, N., Huzarska, M., et al. Tick inoculation in an eyelid region: report on five cases with one complication of the orbital myositis associated with Lyme borreliosis. (2006) *Klin Oczna* 108(4-6): 220-224.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 24) Karma, A., Seppälä, I., Mikkilä, H., et al. Diagnosis and clinical characteristics of ocular Lyme borreliosis. (1995) *Am J Ophthalmol* 119(2): 127-135.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 25) Lawrence, C., Lipton, R.B., Lowy, F.D., et al. Seronegative Chronic Relapsing Neuroborreliosis. (1995) *Eur Neurol* 35: 113-117.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 26) Feng, J., Wang, T., Shi, W., et al. Identification of novel activity against *Borrelia burgdorferi* persists using an FDA approved drug library. (2014) *Emerg Microbes Infect* 3(7): e49.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 27) Oksi, J., Marjamäki, M., Nikoskelainen, J., et al. *Borrelia burgdorferi* detected by culture and PCR in clinical relapse of disseminated Lyme borreliosis. (1999) *Ann Med* 31(3): 225-232.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 28) Preac-Mursic, V., Pfister, H.W., Spiegel, H., et al. First Isolation of *Borrelia burgdorferi* from an Iris Biopsy. (1993) *J Clin Neuro-ophthalmol* 13: 155-161.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 29) Preac-Mursic, V., Weber, K., Pfister, H.W., et al. Survival of *Borrelia burgdorferi* in Antibiotically Treated Patients with Lyme borreliosis. (1989) *Infect* 17: 355-359.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 30) Schmidli, J., Hunziker, T., Moesli, P., et al. Cultivation of *Borrelia burgdorferi* from joint fluid three months after treatment of facial palsy due to Lyme borreliosis. (1988) *J Infect Dis* 158(4): 905-906.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 31) Arnež, M., Ružic-Sabljić, E. Borrelial Lymphocytoma in Children. (2015) *Pediatr Infect Dis J* 34(12): 1319-1322.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 32) Colli, C., Leinweber, B., Müllegger, R., et al. *Borrelia burgdorferi*-associated lymphocytoma cutis: clinicopathologic, immunophenotypic, and molecular study of 106 cases. (2004) *J Cutan Pathol* 31(3): 232-240.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 33) Glatz, M., Resinger, A., Semmelweis, K., et al. Clinical spectrum of skin manifestations of Lyme borreliosis in 204 children in Austria. (2015) *Acta Derm Venereol* 95(5): 565-571.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 34) Gordillo-Pérez, G., Torres, J., Solórzano-Santos, F., et al. *Borrelia burgdorferi* infection and cutaneous Lyme disease, Mexico. (2007) *Emerg Infect Dis* 13(10): 1556-1558.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 35) Krbkova, L., Stanek, G. Therapy of Lyme borreliosis in children. (1996) *Infect* 24(2): 170-173.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 36) Lenormand, C., Jaulhac, B., DeMartino, S., et al. Species of *Borrelia burgdorferi* complex that cause borrelial lymphocytoma in France. (2009) *Br J Dermatol* 161(1): 174-176.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 37) Maraspin, V., Cimperman, J., Lotric-Furlan, S., et al. Solitary borrelial lymphocytoma in adult patients. (2002) *Wien Klin Wochenschr* 114(13-14): 515-523.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 38) Maraspin, V., Nahtigal, K.M., Ružic-Sabljić, E., et al. Borrelial Lymphocytoma in Adult Patients. *Clin Infect Dis* (2016) 63(7): 914-921.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 39) Müllegger, R.R., Means, T.K., Shin, J.J., et al. Chemokine signatures in the skin disorders of Lyme borreliosis in Europe: predominance of CXCL9 and CXCL10 in erythema migrans and acrodermatitis and CXCL13 in lymphocytoma. *Infect Immun* (2007) 75(9): 4621-4628.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 40) Strle, F., Maraspin, V., Pleterški-Rigler, D., et al. Treatment of borrelial lymphocytoma. (1996) *Infect* 24(1): 80-84.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 41) Aberer, E., Klade, H. Cutaneous manifestations of Lyme borreliosis. (1991) *Infect* 19(4): 284-286.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 42) Busch, U., Hizo-Teufel, C., Böhmer, R., et al. *Borrelia burgdorferi* sensu lato strains isolated from cutaneous Lyme borreliosis biopsies differentiated by pulsed-field gel electrophoresis. (1996) *Scand J Infect Dis* 28(6): 583-589.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 43) Schempp, C., Bocklage, H., Lange, R., et al. Further evidence for *Borrelia burgdorferi* infection in morphea and lichen sclerosus et atrophicus confirmed by DNA amplification. (1993) *J Invest Dermatol* 100(5): 717-720.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 44) Wienecke, R., Zöchling, N., Neubert, U., et al. Molecular subtyping of *Borrelia burgdorferi* in erythema migrans and acrodermatitis chronica atrophicans. (1994) *J Invest Dermatol* 103(1): 19-22.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 45) Asbrink, E., Brehmer-Andersson, E., Hovmark, A. Acrodermatitis chronica atrophicans--a spirochetosis. Clinical and histopathological picture based on 32 patients; course and relationship to erythema chronica migrans Afzelius. (1986) *Am J Dermatopathol* 8(3): 209-219.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 46) Aberer, E., Schmidt, B.L., Breier, F., et al. Amplification of DNA of *Borrelia burgdorferi* in urine samples of patients with granuloma annulare and lichen sclerosus et atrophicus. (1999) *Arch Dermatol* 135(2): 210-212.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 47) Buechner, S.A., Winkelmann, R.K., Lautenschlager, S., et al. Localized scleroderma associated with *Borrelia burgdorferi* infection. Clinical, histologic, and immunohistochemical observations. (1993) *J Am Acad Dermatol* 29(2 Pt 1): 190-196.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 48) Eisendle, K., Grabner, T., Zelger, B. Morphoea: a manifestation of infection with *Borrelia* species? (2007) *Br J Dermatol*. 157(6): 1189-1198.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 49) Kaya, G., Berset, M., Prins, C., et al. Chronic borreliosis presenting with morphea- and lichen sclerosus et atrophicus-like cutaneous lesions. a case report. (2001) *Dermatology* 202(4): 373-375.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 50) Malane, M.S., Grant-Kels, J.M., Feder, H.M., Jr., et al. Diagnosis of Lyme disease based on dermatologic manifestations. (1991) *Ann Intern Med* 114(6): 490-498.
[Pubmed](#) | [Crossref](#) | [Others](#)

- 51) Menni, S., Pistrutto, G., Gelmetti, C., et al. Eruzione a tipo pitiriasi lichenoida con perifollicoliti in corso di borreliosi di Lyme. (1994) *Eur J Pediatr Dermatol* 4: 77–80.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 52) Ozkan, S., Atabay, N., Fetil, E., et al. Evidence for *Borrelia burgdorferi* in morphea and lichen sclerosus. (2000) *Int J Dermatol* 39(4): 278-283.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 53) Schempp, C., Bocklage, H., Lange, R., et al. Further evidence for *Borrelia burgdorferi* infection in morphea and lichen sclerosus et atrophicus confirmed by DNA amplification. (1993) *J Invest Dermatol* 100(5): 717-720.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 54) Trevisan, G., Rees, D.H., Stinco, G. *Borrelia burgdorferi* and localized scleroderma. (1994) *Clin Dermatol* 12(3): 475-479.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 55) Vasudevan, B., Chatterjee, M. Lyme Borreliosis and Skin. (2013) *Indian J Dermatol* 58(3): 167–174.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 56) Vasudevan, B., Sagar, A., Bahal, A., et al. Extragenital lichen sclerosus with aetiological link to *Borrelia*. (2011) *Med J Armed Forces India* 67: 370–373.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 57) Zinchuk, A.N., Kalyuzhna, L.D., Pasichna, I.A. Is Localized Scleroderma Caused by *Borrelia burgdorferi*? (2016) *Vector Borne Zoonotic Dis* 16(9): 577-580.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 58) Abele, D.C., Anders, K.H., Chandler, F.W. Benign lymphocytic infiltration (Jessner-Kanof): another manifestation of borreliosis? (1989) *J Am Acad Dermatol* 21(4 Pt 1): 795-797.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 59) Baldari, U., Cattonar, P., Nobile, C., et al. Infantile acrodermatitis of Gianotti-Crosti and Lyme borreliosis. (1996) *Acta Derm Venereol* 76(3): 242-243.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 60) Hashimoto, Y., Takahashi, H., Matsuo, S., et al. Polymerase chain reaction of *Borrelia burgdorferi* flagellin gene in Shulman syndrome. (1996) *Dermatol* 192(2): 136-139.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 61) Lesire, V., Machet, L., Toledano, C., et al. Atypical erythema multiforme occurring at the early phase of Lyme disease? (2000) *Acta Derm Venereol.* 80(3): 222.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 62) Olson, J.C., Esterly, N.B. Urticarial vasculitis and Lyme disease. (1990) *J Am Acad Dermatol* 22(6 Pt 1): 1114-1116.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 63) Asbrink, E., Hovmark, A. Lyme borreliosis: aspects of tick-borne *Borrelia burgdorferi* infection from a dermatologic viewpoint. (1990) *Semin Dermatol* 9(4): 277-291.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 64) Middelveen, M.J., Bandoski, C., Burke, J., et al. Exploring the association between Morgellons disease and Lyme disease: identification of *Borrelia burgdorferi* in Morgellons disease patients. (2015) *BMC Dermatol* 15: 1.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 65) Vasudevan, B., Chatterjee, M. Lyme Borreliosis and Skin. (2013) *Indian J Dermatol* 58(3): 167–174.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 66) Cimperman, J., Maraspin, V., Lotric-Furlan, S., et al. Diffuse reversible alopecia in patients with Lyme meningitis and tick-borne encephalitis. (2000) *Wiener klinische Wochenschrift* 111: 976–977.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 67) Gubertini, N., Bonin, S., Trevisan, G. Lichen sclerosus et atrophicus, scleroderma en coup de sabre and Lyme borreliosis. (2011) *Dermatol Reports* 3(2): e27.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 68) Hercogová, J., Brzonova, I. Lyme disease in central Europe. (2001) *Curr Opin Infect Dis* 14(2): 133-137.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 69) Schwarzenbach, R., Djawari, D. Pseudopelade Brocq--possible sequelae of stage III borrelia infection? *Hautarzt* (1999) 49(11): 835–837.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 70) Bauer, J., Leitz, G., Palmedo, G., et al. Anetoderma: another facet of Lyme disease? (2003) *J Am Acad Dermatol* 48(5 Suppl): S86-S88.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 71) Glatz, M., Resinger, A., Semmelweis, K., et al. Clinical spectrum of skin manifestations of Lyme borreliosis in 204 children in Austria. *Acta Derm Venereol* (2015) 95(5): 565-571.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 72) Melski, J.W., Reed, K.D., Mitchell, P.D., et al. Primary and secondary erythema migrans in central Wisconsin. (1993) *Arch Dermatol* 129(6): 709-716.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 73) Bingham, P.M., Galetta, S.L., Athreya, B., et al. Neurologic manifestations in children with Lyme disease. (1995) *Pediatrics* 96(6): 1053-1056.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 74) Ginsberg, L., Kidd, D. Chronic and recurrent meningitis. (2008) *Pract Neurol* 8(6): 348-361.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 75) Pachner, A.R. Early disseminated Lyme disease: Lyme meningitis. (1995) *Am J Med* 98(4A): 30S-37S.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 76) Steere, A.C., Bartenhagen, N.H., Craft, J.E., et al. Clinical manifestations of Lyme disease. (1986) *Zentralbl Bakteriol Mikrobiol Hyg A* 263(1-2): 201-205.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 77) Karma, A., Seppälä, I., Mikkilä, H., et al. Diagnosis and clinical characteristics of ocular Lyme borreliosis. (1995) *Am J Ophthalmol* 119(2): 127-135.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 78) Mikkilä, H.O., Seppala I.J., Viljanen, M.K., et al. The expanding clinical spectrum of ocular Lyme borreliosis. (2000) *Ophthalmology* 107(3): 581-587.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 79) Raja, H., Starr, M.R., Bakri, S.J. Ocular manifestations of tick-borne diseases. (2016) *Surv Ophthalmol* 61(6): 726-744.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 80) Sathiamoorthi, S., Smith, W.M. The eye and tick-borne disease in the United States. (2016) *Curr Opin Ophthalmol.* 27(6): 530-537.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 81) Boutros, A., Rahn, E., Nauheim, R. Iritis and papillitis as a primary presentation of Lyme disease. (1990) *Ann Ophthalmol* 22(1): 24-25.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 82) Golubic, D., Vinkovic, T., Turk, D., et al. Ocular manifestations of Lyme borreliosis in northwest Croatia. (2004) *Lijec Vjesn* 126(5-6): 124-128.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 83) Winward, K.E., Smith, J.L., Culbertson, W.W., et al. Ocular Lyme borreliosis. (1989) *Am J Ophthalmol* 108(6): 651-657.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 84) Kelly, B., Finnegan, P., Cormican, M., et al. Lyme disease and glomerulonephritis. (2017) *Ir Med J* 92(5): 372.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 85) Kirmizis, D., Chatzidimitriou, D. Comment on ‘Membranous glomerulonephritis secondary to *Borrelia burgdorferi* infection presenting as nephrotic syndrome’. (2010) *Nephrol Dial Transplant* 25(5): 1723-1727.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 86) Kirmizis, D., Chatzidimitriou, D. Renal Manifestations of Lyme disease: Interplay between Infection and Immunostimulation. (2010) *Prevention, Detection and Control, 1st Ed* New York.
[Pubmed](#) | [Crossref](#) | [Others](#)

- 87) Kirmizis, D., Efstratiadis, G., Economidou, D., et al. MPGN secondary to Lyme disease. (2004) *Am J Kidney Dis* 43(3): 544-551.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 88) Kwiatkowska, E., Golembiewska, E., Ciechanowski, K., et al. Minimal-Change Disease Secondary to *Borrelia burgdorferi* Infection. (2012) *Case Rep Nephrol* 2012: 1-3.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 89) McCausland, F., Niedermaier, S., Bijol, V., et al. Lyme disease-associated glomerulonephritis. (2011) *Nephrology Dialysis Transplantation* 26(9): 3054-3056.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 90) Papineni, P., Doherty, T., Pickett, T., et al. Membranous glomerulonephritis secondary to *Borrelia burgdorferi* infection presenting as nephrotic syndrome. (2010) *Clin Kidney J* 3(1): 105-106.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 91) Rawal, B., Rovner, L., Thakar, C., et al. MPGN and Nephrotic Syndrome (NS) Secondary to Lyme disease (LD). (2008) *Am J Kid Dis* 51(4): B83.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 92) Comstock, L.E., Thomas, D.D. Penetration of endothelial cell monolayers by *Borrelia burgdorferi*. (1989) *Infect Immun* 57(5): 1626-1628.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 93) Goellner, M.H., Agger, W.A., Burgess, J.H., et al. Hepatitis due to recurrent Lyme disease. (1988) *Ann Intern Med* 108(5): 707-708.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 94) Schaible, U.E., Gay, S., Museteanu, C., et al. Lyme borreliosis in the severe combined immunodeficiency (scid) mouse manifests predominantly in the joint, heart and liver. (1990) *Am J Pathol* 137(4): 811-820.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 95) Zaidi, S.A., Singer, C. Gastrointestinal and Hepatic Manifestations of Tick-borne Diseases in the United States. (2002) *Clin Infect Dis* 34(9): 1206-1212.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 96) Blazewicz-Zawadzinska, M., Brochocka, A., Lisinska, J., et al. A retrospective analysis of 973 patients with Lyme borreliosis in Kuyavian-Pomeranian voivodship in 2000-2005. (2012) *Przegl Epidemiol* 66(4): 581-586.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 97) Tunev, S.S., Hastey, C.J., Hodzic, E., et al. Lymphadenopathy during Lyme borreliosis is caused by spirochete migration-induced specific B cell activation. (2011) *PLoS Pathog* 7(5): e1002066.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 98) Vukadinov, J., Canak, G., Brkic, S., et al. Clinico-epidemiologic characteristics of Lyme disease treated at the Infectious Disease in Novy Sad 1993-1998. (2001) *Med Pregl* 54(9-10): 470-475.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 99) Brtkova, J., Jirickova, P., Kapla, J., et al. *Borrelia* arthritis and chronic myositis accompanied by typical chronic dermatitis. (2008) *JBR-BTR* 91(3): 88-89.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 100) Carvounis, P.E., Mehta, A.P., Geist, C.E. Orbital myositis associated with *Borrelia burgdorferi* (Lyme disease) infection. (2004) *Ophthalmology* 111(5): 1023-1028.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 101) Holak, H., Holak, N., Huzarska, M., et al. Tick inoculation in an eyelid region: report on five cases with one complication of the orbital myositis associated with Lyme borreliosis. (2006) *Klin Oczna* 108(4-6): 220-224.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 102) Holmgren, A.R., Matteson, E.L. Lyme myositis. (2006) *Arthritis Rheum* 54(8): 2697-2700.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 103) Sauer, A., Speeg-Schatz, C., Hansmann, Y. Two cases of orbital myositis as a rare feature of Lyme borreliosis. (2011) *Case Rep Infect Dis* 2011:372470.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 104) Waton, J., Pinault, A.L., Pouaha, J., et al. [Lyme disease could mimic dermatomyositis]. (2007) *Rev Med Interne* 28(5): 343-345.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 105) Salzman, B.E., Stonehouse, A., Studdiford, J. Late Diagnosis of Early Disseminated Lyme Disease: Perplexing Symptoms in a Gardener. (2008) *J Am Board Fam Med* 21(3): 234-236.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 106) Mehrzad, R., Bravoco, J. Pancytopenia in Lyme disease. (2014) *BMJ Case Rep* 2014.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 107) Sathiamoorthi, S., Smith, W. The eye and tick-borne disease in the United States. (2016) *Curr Opin Ophthalmol* 27(6): 530-537.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 108) Cuisset, T., Hamilos, M., Vanderheyden, M. Coronary aneurysm in Lyme disease: Treatment by covered stent. (2008) *Int J Cardio* 128(2): e72-e73.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 109) Gasser, R., Watzinger, N., Eber, B., et al. Coronary artery aneurysm in two patients with long-standing Lyme borreliosis. (1994) *Lancet* 344(8932): 1300-1301.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 110) Hinterseher, I., Gäbel, G., Corvinus, F., et al. Presence of *Borrelia burgdorferi* sensu lato antibodies in the serum of patients with abdominal aortic aneurysms. (2012) *Eur J Clin Microbiol Infect Dis* 31(5): 781-789.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 111) Watzinger, N., Fruhwald, F.M., Schafhalter, I., et al. [Coronary aneurysm in a 69-year-old patient. Transthoracic echocardiography]. (1995) *Ultraschall Med* 16(04): 200-202.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 112) Xu, L., Heath, J., Burke, A. Ascending aortitis: a clinicopathological study of 21 cases in a series of 300 aortic repairs. (2014) *Pathology* 46(4): 296-305.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 113) Clinckaert, C., Bidgoli, S., Verbeet, T., et al. Peroperative cardiogenic shock suggesting acute coronary syndrome as initial manifestation of Lyme carditis. (2016) *J Clin Anesth* 35: 430-433.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 114) Bacino, L., Gazzarata, M., Siri, G., et al. [Complete atrioventricular block as the first clinical manifestation of a tick bite (Lyme disease)]. (2011) *G Ital cardiol(Rome)* 12(3): 214-216.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 115) Darnedde S., Piper C., Kühl U, et al. [The Lyme carditis as a rare differential diagnosis to an anterior myocardial infarction] [in German]. (2002) *Z Kardiologie* 91(12):1053-1060. doi: [PubMed]
[Pubmed](#) | [Crossref](#) | [Others](#)
- 116) Guenther, F., Bode C, Faber, T. [Reversible complete heart block by re-infection with *Borrelia burgdorferi* with negative IgM-antibodies]. (2009) *Dtsch med Wochenschr* 134(1-2):23-26.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 117) Karadag, B., Spieker, L., Schwitter, J., et al. Lyme carditis: restitutio ad integrum documented by cardiac magnetic resonance imaging. (2004) *Cardiol Rev* 12(4): 185-187.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 118) Kostic, T., Momcilovic, S., Perišić Z.D., et al. Manifestations of Lyme carditis. (2017) *Int J Cardiol*. 232: 24-32.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 119) Kubánek, M., Šramko, M., Berenová, D., et al. Detection of *Borrelia burgdorferi* sensu lato in endomyocardial biopsy specimens in individuals with recent-onset dilated cardiomyopathy. (2012) *Eur J Heart Fail* 14(6): 588-596.
[Pubmed](#) | [Crossref](#) | [Others](#)

- 120) Meimoun, P., Sayah, S., Benali, T., et al. [Lyme disease presenting as infarction pain. A case report] [in French]. (2001) *Arch mal coeur vaiss* 94(12): 1419–1422.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 121) Rostoff, P., Konduracka, E., Massri, E., et al. [Lyme carditis presenting as acute coronary syndrome: A case report] [in Polish]. (2008) *Kardiol pol* 66(4): 420–425.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 122) Rudenko, N., Golovchenko, M., Mokracek, A., et al. Detection of *Borrelia bisettii* in cardiac valve tissue of a patient with Endocarditis and Aortic valve Stenosis in the Czech Republic. (2008) *J Clin Microbiol* 46(10): 3540–3543.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 123) Sauvant, G., Bossart, W., Kurrer, M., et al. [Diagnosis and course of myocarditis: A survey in the medical clinics of Zurich university hospital 1980 to 1998]. (2000) *Schweiz med Wochenschr* 130(36):1265–1271.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 124) Stanek, G., Klein, J., Bittner, R., et al. *Borrelia burgdorferi* as an etiologic agent in chronic heart failure?. (1991) *Scand j infect dis Suppl* 77: 85–7.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 125) Burakgazi, A.Z. Lyme disease –induced polyradiculopathy mimicking amyotrophic lateral sclerosis. (2014) *Int J Neurosci* 124(11): 859–862.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 126) Christova, I., Komitova, R. Clinical and epidemiological features of Lyme borreliosis in Bulgaria. (2004) *Wien Klin Wochenschr* 116(11-2): 42–46.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 127) Lawrence, C., Lipton, R.B., Lowy, F.D., et al. Seronegative Chronic Relapsing Neuroborreliosis. (1995) *Eur Neurol* 35(2): 113–117.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 128) Marconi, R.T., Hohenberger, S., Jauris-Heipke, S., et al. Genetic Analysis of *Borrelia garinii* OspA Serotype 4 Strains Associated with Neuroborreliosis: Evidence for Extensive Genetic Homogeneity. (1999) *J Clin Microbiol* 37(12): 3965–3970.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 129) Nafeev, A.A., Klimova, L.V. [Clinical manifestations of neuroborreliosis in the Volga region]. (2010) *Ter Arkh* 82(11): 68–70.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 130) Habek, M., Mubrin, Z., Brinar, V.V. Avellis syndrome due to borreliosis. (2007) *Eur J Neurol* 14(1): 112–114.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 131) Halperin, J.J., Little, B.W., Coyle, P.K., et al. Lyme disease: cause of a treatable peripheral neuropathy. (1987) *Neurology* 37(11): 1700–1706.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 132) Krim, E., Guehl, D., Burbaud, P., et al. Retrobulbar optic neuritis: a complication of Lyme disease?. (2007) *J Neurol Neurosurg Psychiatry* 78(12): 1409–1410.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 133) Midgard, R., Hofstad, H. Unusual manifestations of nervous system *Borrelia burgdorferi* infection. (1987) *Arch Neurol* 44(7): 781–783.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 134) Rothermel, H., Hedges, T.R., 3rd, Steere, A.C. Optic neuropathy in children with Lyme disease. (2001) *Pediatrics* 108(2): 477–481.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 135) Träisk, F., Lindquist, L. Optic nerve involvement in Lyme disease. (2012) *Curr Opin Ophthalmol* 23(6): 485–490.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 136) Almoussa, M., Goertzen, A., Fauser, B., et al. Stroke as an Unusual First Presentation of Lyme Disease. (2015) *Case Rep Neurol Med* 2015: 389081.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 137) Back, T., Grünig, S., Winter, Y., et al. Neuroborreliosis-associated cerebral vasculitis: long-term outcome and health-related quality of life. (2013) *J Neurol* 260(6): 1569–1575.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 138) Blažina, K., Miletic, V., Relja, M., et al. Cerebral sinuvenous thrombosis: a rare complication of Lyme neuroborreliosis. (2015) *Wien klin Wochenschr* 127(1-2): 65–67.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 139) Brogan, G.X., Homan, C.S., Viccellio, P. The enlarging clinical spectrum of Lyme disease: Lyme cerebral vasculitis, a new disease entity. (1990) *Ann Emerg Med* 19: 572–576.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 140) Defer, G., Levy, R., Brugieres, P., et al. Lyme disease presenting as a stroke in the vertebrobasilar territory: MRI. (1993) *Neuroradiology* 35(7): 529–531.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 141) Hammers-Berggren, S., Grondahl, A., Karlsson, M., et al. Screening for neuroborreliosis in patients with stroke. (1993) *Stroke* 24(9): 1393–1396.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 142) Hanny, P.E., Hauselmann, H.J. [Lyme disease from the neurologist's viewpoint]. (1987) *Schweiz Med Wochenschr* 117(24): 901–915.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 143) Heinrich, A., Khaw, A.V., Ahrens, N., et al. Cerebral vasculitis as the only manifestation of *Borrelia burgdorferi* infection in a 17-year-old patient with basal ganglia infarction. (2003) *Eur Neurol* 50(2): 109–112.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 144) Keil, R., Baron, R., Kaiser, R., et al. [Vasculitis course of neuroborreliosis with thalamic infarct]. [in German]. (1997) *Nervenarzt* 68(4): 339–341.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 145) Klingebiel, R., Benndorf, G., Schmitt, M., et al. Large cerebral vessel occlusive disease in Lyme neuroborreliosis. (2002) *Neuropediatrics* 33(1): 37–40.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 146) Kraemer, M., Berlit, P. Systemic, secondary and infectious causes for cerebral vasculitis: clinical experience with 16 new European cases. (2009) *Rheumatol Int* 30(11): 1471–1476.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 147) Kuntzer, T., Bogousslavsky, J., Miklossy, J., et al. *Borrelia* rhombencephalomyelopathy. (1991) *Arch Neurol* 48(8): 832–836.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 148) Kurian, M., Pereira, V.M., Vargas, M.I., et al. Stroke-like Phenomena Revealing Multifocal Cerebral Vasculitis in Pediatric Lyme Neuroborreliosis. (2015) *J Child Neurol* 30(9): 1226–1229.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 149) Laroche, C., Lienhardt, A., Boulesteix, J. [Ischemic stroke caused by neuroborreliosis]. (1999) *Arch Pediatr* 6(12): 1302–1305.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 150) Lebas, A., Toulgoat, F., Saliou, G., et al. Stroke Due to Lyme Neuroborreliosis: Changes in Vessel Wall Contrast Enhancement. (2012) *J Neuroimaging* 22(12): 210–212.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 151) May, E.F., Jabbari, B. Stroke in neuroborreliosis. (1990) *Stroke* 21(8): 1232–1235.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 152) Miklossy, J., Kuntzer, T., Bogousslavsky, J., et al. Meningovascular form of neuroborreliosis: similarities between neuropathological findings in a case of Lyme disease and those occurring in tertiary neurosyphilis. (1990) *Acta Neuropathol* 80(5): 568–572.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 153) Miklossy, J. Biology and neuropathology of dementia in syphilis and Lyme disease. (2008) *Handb Clin Neurol* 89: 825–844. [PubMed]
[Pubmed](#) | [Crossref](#) | [Others](#)
- 154) Olsson, J.E., Zbornikova, V. Neuroborreliosis simulating a progressive stroke. (1990) *Acta Neurol Scand* 81: 471–474.
[Pubmed](#) | [Crossref](#) | [Others](#)

- 155) Reik L., Jr. Stroke due to Lyme disease. (1993) *Neurology* 43(12): 2705–2707.
[PubMed](#) | [Crossref](#) | [Others](#)
- 156) Rey, V., Du Pasquier, R., Muehl, A., et al. [Multiple ischemic strokes due to *Borrelia garinii* meningovascularitis]. (2010) *Rev Neurol (Paris)* 166(11): 931–934.
[PubMed](#) | [Crossref](#) | [Others](#)
- 157) Romi, F., Krakenes, J., Aarli, J.A., et al. Neuroborreliosis with vasculitis causing stroke-like manifestations. (2004) *Eur Neurol* 51(1): 49–50.
[PubMed](#) | [Crossref](#) | [Others](#)
- 158) Schmiedel, J., Gahn, G., von Kummer, R., et al. Cerebral vasculitis with multiple infarcts caused by lyme disease. (2004) *Cerebrovasc Dis* 17(1): 79–81.
[PubMed](#) | [Crossref](#) | [Others](#)
- 159) Schmitt, A.B., Kuker, W., Nacimiento, W. [Neuroborreliosis with extensive cerebral vasculitis and multiple cerebral infarcts]. (1999) *Nervenarzt* 70(2): 167–171.
[PubMed](#) | [Crossref](#) | [Others](#)
- 160) Shadick, N.A., Phillips, C.B., Logigian, E.L., et al. The long-term clinical outcomes of Lyme disease. A population-based retrospective cohort study. (1994) *Ann Intern Med* 121(8): 560–567.
[PubMed](#) | [Crossref](#) | [Others](#)
- 161) Sparsa, L., Blanc, F., Lauer, V., et al. Recurrent ischemic strokes revealing Lyme meningovascularitis. (2009) *Rev Neurol (Paris)* 165(3): 273–277.
[PubMed](#) | [Crossref](#) | [Others](#)
- 162) Topakian, R., Stieglbauer, K., Aichner, F.T. Unexplained cerebral vasculitis and stroke: keep Lyme neuroborreliosis in mind. (2007) *Lancet Neurol* 6(9): 756–757.
[PubMed](#) | [Crossref](#) | [Others](#)
- 163) Uldry, P.A., Regli, F., Bogousslavsky, J. Cerebral angiopathy and recurrent strokes following *Borrelia burgdorferi* infection. (1987) *J Neurol Neurosurg Psychiatr* 50(12): 1703–1704.
[PubMed](#) | [Crossref](#) | [Others](#)
- 164) Van Snick, S., Duprez, T.P., Kabamba, B., et al. Acute ischaemic pontine stroke revealing lyme neuroborreliosis in a young adult. (2008) *Acta Neurol Belg* 108(3): 103–106.
[PubMed](#) | [Crossref](#) | [Others](#)
- 165) Veenendaal-Hilbers, J.A., Perquin, W.V., Hoogland, P.H., et al. Basal meningovascularitis and occlusion of the basilar artery in two cases of *Borrelia burgdorferi* infection. (1988) *Neurology* 38(8): 1317–1319.
[PubMed](#) | [Crossref](#) | [Others](#)
- 166) Wittwer, B., Pelletier, S., Ducrocq, X., et al. Cerebrovascular Events in Lyme Neuroborreliosis. (2015) *J Stroke Cerebrovasc Dis* 24(7): 1671–1678.
[PubMed](#) | [Crossref](#) | [Others](#)
- 167) Zajkowska, J., Garkowski, A., Moniuszko, A., et al. Vasculitis and stroke due to Lyme neuroborreliosis – a review. (2014) *Infect Dis* 47(1): 1–6. doi:10.3109/00365548.2014.961544. [PubMed]
[PubMed](#) | [Crossref](#) | [Others](#)
- 168) Zhang, Y., Lafontant, G., Bonner, F.J., Jr. Lyme neuroborreliosis mimics stroke: a case report. (2000) *Arch phys Med Rehab* 81(4): 519–521.
[PubMed](#) | [Crossref](#) | [Others](#)
- 169) Intracranial aneurysms in three patients with disseminated Lyme borreliosis: cause or chance association? (1998) *J Neurol Neurosurg Psychiatry* 64(5): 636–642.
[PubMed](#) | [Crossref](#) | [Others](#)
- 170) Polet, J.D., Weinstein, H.C. Lyme borreliosis and intracranial aneurysm. (1999) *J Neurol Neurosurg Psychiatry* 66(6): 806–807.
[PubMed](#) | [Crossref](#) | [Others](#)
- 171) Cassarino, D.S., Quezado, M.M., Ghatak, N.R., et al. Lyme-associated parkinsonism: a neuropathologic case study and review of the literature. (2003) *Arch Pathol Lab Med* 127(9): 1204–1206.
[PubMed](#) | [Crossref](#) | [Others](#)
- 172) Scholz, S.W., Bras, J. Genetics Underlying Atypical Parkinsonism and Related Neurodegenerative Disorders. (2015) *Int J Mol Sci* 16(10): 24629–24655.
[PubMed](#) | [Crossref](#) | [Others](#)
- 173) Rocha, R., Lisboa, L., Neves, J., et al. Neuroborreliosis Presenting as Acute Disseminated Encephalomyelitis. (2012) *Pediatric Emergency Care* 28(12): 1374–1376.
[PubMed](#) | [Crossref](#) | [Others](#)
- 174) Verma, V., Roman, M., Shah, D., et al. A case of chronic progressive lyme encephalitis as a manifestation of late lyme neuroborreliosis. (2014) *Infect Dis Rep* 6(4): 5496.
[PubMed](#) | [Crossref](#) | [Others](#)
- 175) Miklossy, J. Chronic or late lyme neuroborreliosis: analysis of evidence compared to chronic or late neurosyphilis. (2012) *Open Neurol J* 6: 146–157.
[PubMed](#) | [Crossref](#) | [Others](#)
- 176) Miklossy, J. Historic evidence to support a causal relationship between spirochetal infections and Alzheimer’s disease. (2015) *Front Aging Neurosci* 7: 46.
[PubMed](#) | [Crossref](#) | [Others](#)
- 177) Yoshinari, N.H., de Barros, P.J., Bonoldi, V.L., et al. [Outline of Lyme borreliosis in Brazil]. (1997) *Rev Hosp ClinFac Med Sao Paulo* 52(2): 111–117.
[PubMed](#) | [Crossref](#) | [Others](#)
- 178) Ackermann, R., Gollmer, E., Rehse-Küpper, B. [Progressive *Borrelia* encephalomyelitis. Chronic manifestation of erythema chronicum migrans disease of the nervous system]. (1985) *Deutsch Med Wochenschr* 110(26): 1039–1042.
[PubMed](#) | [Crossref](#) | [Others](#)
- 179) Bensch, J., Olcen, P., Hagberg, L. Destructive chronic borrelia meningoencephalitis in a child untreated for 15 years. (1987) *Scand J Infect Dis* 19(6): 697–700.
[PubMed](#) | [Crossref](#) | [Others](#)
- 180) Bertrand, E., Szpak, G.M., Pilkowska, E., et al. Central nervous system infection caused by *Borrelia burgdorferi*. Clinico-pathological correlation of three post-mortem cases. (1999) *Folia neuropathol* 37(1): 43–51.
[PubMed](#) | [Crossref](#) | [Others](#)
- 181) Bogsrud, T., Odegaard, B. Tick-borne borreliosis. A case of chronic meningoencephalitis caused by *Borrelia burgdorferi*. (1987) *Tidsskr Nor Laegeforen* 107(1): 25–7, 49.
[PubMed](#) | [Crossref](#) | [Others](#)
- 182) Cassarino, D.S., Quezado, M.M., Ghatak, N.R. Lyme-associated parkinsonism: a neuropathologic case study and review of the literature. (2003) *Arch Pathol Lab Med* 127(9): 1204–1206.
[PubMed](#) | [Crossref](#) | [Others](#)
- 183) Czyrny, M., Jura, E., Seniow, J., et al. [Severe meningoencephalitis in *Borrelia burgdorferi* infection]. (1998) *NeurolNeurochir Pol* 32(2): 387–393.
[PubMed](#) | [Crossref](#) | [Others](#)
- 184) De Cauwer, H., Declerck, S., De Smet, J., et al. Motor neuron disease features in a patient with neuroborreliosis and a cervical anterior horn lesion. (2009) *Acta clinBelg* 64(3): 225–227.
[PubMed](#) | [Crossref](#) | [Others](#)
- 185) Diring, M.N., Halperin, J.J., Dattwyler, R.J. Lyme meningoencephalitis: report of a severe, penicillin-resistant case. (1987) *Arthritis Rheum* 30(6): 705–708.
[PubMed](#) | [Crossref](#) | [Others](#)
- 186) Drouet, A., Meyer, X., Guilloton, L., et al. [Acute severe leukoencephalitis with posterior lesions due to *Borrelia burgdorferi* infection]. (2003) *Presse Med* 32(34): 1607–1609.
[PubMed](#) | [Crossref](#) | [Others](#)
- 187) Duray, P.H., Steere, A.C. Clinical pathologic correlations of Lyme disease by stage. (1988) *Ann N Y Acad Sci* 539: 65–79.
[PubMed](#) | [Crossref](#) | [Others](#)

- 188) Duray, P.H., Steere, A.C. The spectrum of organ and systems pathology in human Lyme disease. (1986) *Zentralbl Bakteriell Mikrobiol Hyg A* 263(1-2): 169–178.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 189) Duray, P.H. Histopathology of clinical phases of human Lyme disease. (1989) *Rheum Dis Clin North Am* 15(4): 691–710.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 190) Duray, P.H. The surgical pathology of human Lyme disease: An enlarging picture. (1987) *Am J Surg Pathol* 11(Suppl 1): 47–60.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 191) Fénelon, G., Chaîne, P., Lèche, J., Guillard, A. [Isolated meningoencephalitis in Lyme disease]. (1987) *Ann Med Interne* 138(2): 149–150.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 192) Ferroir, J., Reignier, A., Nicolle, M., et al. [Meningoradiculoneuroencephalitis in Lyme disease. A case with major regressive mental disorders]. (1988) *Presse Med* 17(14): 697.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 193) Kacinski, M., Zajac, A., Skowronek-Bala, B., et al. CNS Lyme disease manifestation in children. (2007) *Przeqł lek* 64(S3): 38–40.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 194) Kawano, Y., Shigeto, H., Shiraishi, Y., et al. Case of *Borrelia* brainstem encephalitis presenting with severe dysphagia. (2010) *Clin Neurol* 50: 265–267.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 195) Nadelman, R.B., Nowakowski, J., Forseter, G., et al. The clinical spectrum of early Lyme borreliosis in patients with culture-confirmed erythema migrans. (1996) *Am J Med* 100: 502–508.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 196) Neumarker, K.J., Dudeck, U., Plaza, P. [*Borrelia* encephalitis and catatonia in adolescence]. (1989) *Nervenarzt* 60(2): 115–119.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 197) Oksi, J., Kalimo, H., Marttila, R.J., et al. Inflammatory brain changes in Lyme borreliosis. A report on three patients and review of literature. (1996) *Brain* 119(Pt 6): 2143–2154.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 198) Oksi, J., Viljanen, M.K., Kalimo, H., et al. Fatal encephalitis caused by concomitant infection with tick-borne encephalitis virus and *Borrelia burgdorferi*. Clinical infectious diseases: an official publication of the Infectious. (1993) *Dis Soc Am* 16(3): 392–396.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 199) Omasits, M., Seiser, A., Brainin, M. [Recurrent and relapsing course of borreliosis of the nervous system]. (1990) *Wien Klin Wochenschr* 102(1): 4–12.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 200) Oschmann, P., Dorndorf, W., Hornig, C., et al. Stages and syndromes of neuroborreliosis. (1998) *J Neurol* 245(5): 262–272.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 201) Pachner, A.R., Duray, P., Steere, A.C. Central nervous system manifestations of Lyme disease. (1989) *Arch Neurol* 46: 790–795.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 202) Pennekamp, A., Jaques, M. [Chronic neuroborreliosis with gait ataxia and cognitive disorders]. (1997) *Praxis* 86(20): 867–869.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 203) Pfefferkorn, T., Feddersen, B., Schulte-Altdorneburg, G., et al. Tick-borne encephalitis with polyradiculitis documented by MRI. (2007) *Neurology* 68(15): 1232–1233.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 204) Ponz, E., Graus, F., Alvarez, R., et al. [Meningoencephalomyelitis caused by *Borrelia burgdorferi*: a case without epidemiologic history or chronic migratory erythema]. (1989) *Med Clin (Barc)* 93(6): 218–220.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 205) Reik, L., Burgdorfer, W., Donaldson, J.O. Neurologic abnormalities in Lyme disease without erythema chronicum migrans. (1986) *Am J Med* 81(1): 73–78.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 206) Shadick, N.A., Phillips, C.B., Logigian, E.L., et al. The long-term clinical outcomes of Lyme disease. A population-based retrospective cohort study. (1994) *Ann Intern Med* 121(8): 560–567.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 207) Weder, B., Wiedersheim, P., Matter, L., et al. Chronic progressive neurological involvement in *Borrelia burgdorferi* infection. (1987) *J Neurol* 234(1): 40–43.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 208) Aasly, J., Nilsen, G. Cerebral atrophy in Lyme disease. (1990) *Neuroradiology* 32(3): 252.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 209) Allen, H.B., Morales, D., et al. Alzheimer's disease: A novel hypothesis integrating spirochetes, biofilm, and the immune system. (2016) *Journal of Neuroinfectious Diseases* 07(01).
[Pubmed](#) | [Crossref](#) | [Others](#)
- 210) Almeida, O.P., Lautenschlager, N.T. Dementia associated with infectious diseases. (2005) *International Psychogeriatrics* 17(S1): S65–77
[Pubmed](#) | [Crossref](#) | [Others](#)
- 211) Bu, X., Yao, X., Jiao, S., et al. A study on the association between infectious burden and Alzheimer's disease. (2014) *Eur J Neurol* 22(12): 1519–1525.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 212) Dupuis, M.J. Multiple neurologic manifestations of *Borrelia burgdorferi* infection. (1988) *Rev Neurol* 144(2): 765–775.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 213) Duray, P.H. The surgical pathology of human Lyme disease. An enlarging picture. (1987) *Am J Surg Pathol* 11(S1): 47–60.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 214) Itzhaki, R., Lathe, R., Balin, B., et al. Microbes and Alzheimer's Disease. (2016) *J Alzheimer's Dis* 51(4): 979–984.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 215) Juchnowicz, D., Rudnik I., Czernikiewicz, A., et al. [Mental disorders in the course of Lyme borreliosis and tick borne encephalitis]. (2002) *Przegląd Epidemiol* 156(S1): 37–50.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 216) Koc, F., Bozdemir, H., Pekoz, T., Aksu H, et al. Lyme disease presenting as subacute transverse myelitis. (2009) *Acta Neurol Belg* 109(4): 326–329.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 217) MacDonald, A., Miranda, J. Concurrent neocortical borreliosis and Alzheimer's disease. (1987) *Human Pathology* 18(7): 759–761.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 218) MacDonald, A.B. *Borrelia* in the brains of patients dying with dementia. (1986) *JAMA* 256(16): 2195–2196.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 219) Mawanda, F., Wallace, R. Can infections cause Alzheimer's disease? (2013) *Epidemiol Rev* 35(1): 161–180.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 220) Miklossy, J., Gern, L., Darekar, P., et al. Senile plaques, neurofibrillary tangles and neuropil threads contain DNA? (1995) *Journal of Spirochetal and Tick Borne Diseases* 2: 1–5.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 221) Miklossy, J., Kasas, S., Janzer, R.C., et al. Further ultrastructural evidence that spirochetes may play a role in the aetiology of Alzheimer's disease. (1994) *Neuroreport* 5(10): 1201–1204.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 222) Miklossy, J., Kasas, S., Zurn, A., et al. Persisting atypical and cystic forms of *Borrelia burgdorferi* and local inflammation in Lyme neuroborreliosis. (2008) *J Neuroinflammation* 5(1): 40.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 223) Miklossy, J., Khalili, K., Gern, L., et al. *Borrelia burgdorferi* persists in the brain in chronic Lyme neuroborreliosis and may be associated with Alzheimer disease. (2004) *J Alzheimer's Dis* 6(6): 639–649.
[Pubmed](#) | [Crossref](#) | [Others](#)

- 224) Miklossy, J., Kis, A., Radenovic, A., et al. Beta-amyloid deposition and Alzheimer's type changes induced by *Borrelia spirochetes*. (2006) *Neurobiology of Aging* 27(2): 228–236.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 225) Miklossy, J. Alzheimer's disease - a neurospirochetosis. Analysis of the evidence following Koch's and hill's criteria. (2011) *J Neuroinflammation* 8(1):90.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 226) Miklossy, J. Alzheimer's disease--a spirochetosis? (1993) *Neuroreport* 4(7): 841–848.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 227) Miklossy, J. Bacterial Amyloid and DNA are Important Constituents of Senile Plaques: Further Evidence of the Spirochetal and Biofilm Nature of Senile Plaques. (2016) *J Alzheimer's Dis* 53(4): 1459-1473.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 228) Miklossy, J. Chronic inflammation and amyloidogenesis in Alzheimer's disease -- role of Spirochetes. (2008) *J Alzheimers dis* 13(4): 381–391.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 229) Miklossy, J. Emerging roles of pathogens in Alzheimer disease. (2011) *Expert Rev Mol Med* 13: e30.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 230) Miklossy, J. Historic evidence to support a causal relationship between spirochetal infections and Alzheimer's disease. (2015) *Front Aging Neurosci* 7: 46.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 231) Giacobini, E., Becker, R., Miklossy, J. The spirochetal etiology of Alzheimer's disease: A putative therapeutic approach. In *Alzheimer Disease: Therapeutic Strategies: Proceedings of the Third International Springfield Alzheimer Symposium*. Edited by: Birkhauser Boston Inc. (1994) Part I: 41-48.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 232) Pennekamp, A., Jaques, M. [Chronic neuroborreliosis with gait ataxia and cognitive disorders]. (1997) *Praxis (Bern 1994)* 86(20): 867–869.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 233) Reik, L.Jr., Burgdorfer, W., Donaldson, J.O. Neurologic abnormalities in Lyme disease without erythema chronicum migrans. (1986) *Am J Med* 81(1): 73–78.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 234) Schaeffer, S., Le Doze, F., De la, Sayette.V., et al. Dementia in Lyme disease. (1994) *Presse Med* 23(18): 861.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 235) Tarasów, E., Ustymowicz, A., Zajkowska, J., et al. [Neuroborreliosis: CT and MRI findings in 14 cases. Preliminary communication]. (2001) *Neurol neurochir pol* 35(5): 803–13.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 236) Waniek, C., Prohownik, I., Kaufman, M.A., et al. Rapidly progressive frontal-type dementia associated with Lyme disease. (1995) *J Neuropsychiatry Clin Neurosci* 7(3): 345–347.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 237) Fallon, B., Kochevar, J., Gaito, A., et al. The underdiagnosis of neuropsychiatric lyme disease in children and adults. (1998) *Psychiatr Clin North Am* 21(3): 693-703.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 238) Fallon, B.A., Niels, J.A. Lyme disease: a neuropsychiatric illness. (1994) *The Am J Psychiatry* 151(11): 1571–1583.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 239) Fallon, B., Niels, J., Parsons, B., et al. Psychiatric manifestations of Lyme borreliosis. (1993) *J Clin Psychiatry* 54(7): 263-268.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 240) Tager, F.A., Fallon, B.A., Keilp, J., et al. A controlled study of cognitive deficits in children with chronic Lyme disease. (2001) *J Neuropsychiatry Clin Neurosci* 13(4): 500-507.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 241) Deanehan JK, Kimia AA, Tan Tanny SP, et al. Distinguishing Lyme from septic knee monoarthritis in Lyme disease-endemic areas. (2013) *Pediatrics* 131(3): e695-e701.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 242) Jones, K.L., McHugh, G.A., Glickstein, L.J., et al. Analysis of *Borrelia burgdorferi* genotypes in patients with Lyme arthritis: High frequency of ribosomal RNA intergenic spacer type 1 strains in anti-biotoxic-refractory arthritis. (2009) *Arthritis Rheum.* 60(7): 2174-2182.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 243) Lesnicar, G., Zerdoner, D. Temporomandibular joint involvement caused by *Borrelia Burgdorferi*. (2007) *J Cranio-Maxillo-fac Surg* 35(8): 397-400. doi:10.1016/j.jcms.2007.06.003. [PubMed]
[Pubmed](#) | [Crossref](#) | [Others](#)
- 244) Pańczuk, A., Tokarska-Rodak, M., Koziol-Montewka, M., et al. The incidence of *Borrelia burgdorferi*, *Anaplasma phagocytophilum* and *Babesia microti* coinfections among foresters and farmers in eastern Poland. (2016) *J Vector Borne Dis* 53(4): 348-354.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 245) Renaud, I., Cachin, C., Gerster, J-C. Good outcomes of Lyme arthritis in 24 patients in an endemic area of Switzerland. (2004) *Jt Bone Spine Rev Rhum.* 71(1): 39-43. doi:10.1016/S1297-319X(03)00160-X. [PubMed]
[Pubmed](#) | [Crossref](#) | [Others](#)
- 246) Schmid, G. Epidemiology and Clinical Similarities of Human Spirochetal Diseases. (1989) *Clin Infect Dis* 11Suppl 6: S1460-S1469.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 247) Yoshinari, N.H., de Barros, P.J., Bonoldi, V.L., et al. [Outline of Lyme borreliosis in Brazil]. (1997) *Rev Hosp Clin Fac Med Sao Paulo* 52(2): 111-117.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 248) Lipsker, D., Hansmann, Y., Limbach, F., et al. Disease expression of Lyme borreliosis in northeastern France. (2001) *Eur J Clin Microbiol Infect Dis* 20(4): 225-230.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 249) Wendling, D., Sevrin, P., Bouchaud-Chabot, A., et al. Parsonage-Turner syndrome revealing Lyme borreliosis. (2009) *Joint Bone Spine Rev Rhum* 76(2): 202-204.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 250) Drenckhahn, A., Spors, B., Knierim, E. Acute isolated partial oculomotor nerve palsy due to Lyme neuroborreliosis in a 5 year old girl. (2016) *Eur J Paediatr Neurol.* 20(6): 977-979.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 251) Karma, A., Seppälä, I., Mikkilä, H., et al. Diagnosis and clinical characteristics of ocular Lyme borreliosis. (1995) *Am J Ophthalmol* 119(2): 127-135.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 252) Golubic, D., Vinkovic, T., Turk, D., et al. [Ocular manifestations of Lyme borreliosis in northwest Croatia]. (2004) *Lijec Vjesn* 126(5-6): 124-128.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 253) Mikkilä, H.O., Seppälä, I.J., Viljanen, M.K., et al. The expanding clinical spectrum of ocular lyme borreliosis. (2000) *Ophthalmology* 107(3): 581-587.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 254) Krause, P.J., Telford, S.R., Spielman, A., et al. Concurrent Lyme disease and babesiosis. Evidence for increased severity and duration of illness. (1996) *JAMA.* 275(21): 1657-1660. [PubMed]
[Pubmed](#) | [Crossref](#) | [Others](#)
- 255) Muslmani, M., Gilson, M., Sudre, A., et al. [Lyme disease with hepatitis and corticosteroids: a case report]. (2012) *Rev Med Interne* 33(6): 339-342.
[Pubmed](#) | [Crossref](#) | [Others](#)
- 256) Mc Causland, F.R., Niedermaier, S., Bijol, V., et al. Lyme disease-associated glomerulonephritis. (2011) *Nephrol Dial Transplant* 26(9): 3054-3056.
[Pubmed](#) | [Crossref](#) | [Others](#)

- 257) Florens, N., Lemoine, S., Guebre-Egziabher, F., et al. Chronic Lyme borreliosis associated with minimal change glomerular disease: a case report. (2017) *BMC Nephrol* 18(1). doi:10.1186/s12882-017-0462-4. [PubMed] [Pubmed](#) | [Crossref](#) | [Others](#)
- 258) Kelly, B., Finnegan, P, Cormican, M., et al. Lyme disease and glomerulonephritis. (1999) *Ir Med J* 92(5): 372 [PubMed]. [Pubmed](#) | [Crossref](#) | [Others](#)
- 259) Papineni, P., Doherty, T., Pickett, T., et al. Membranous glomerulonephritis secondary to *Borrelia burgdorferi* infection presenting as nephrotic syndrome. (2010) *NDT Plus* 3(1): 105-106 [Pubmed](#) | [Crossref](#) | [Others](#)
- 260) Rawal, B., Rovner, L., Thakar, C., et al. MPGN and nephrotic syndrome secondary to Lyme disease. (2008) *Am J Kidney Dis* 51(4): 83. [Pubmed](#) | [Crossref](#) | [Others](#)
- 261) Faul, J.L., Ruoss, S., Doye, R.L. Diaphragmatic paralysis due to Lyme disease. (1999) *Eur Respir J* 13(3): 700–702. [Pubmed](#) | [Crossref](#) | [Others](#)
- 262) Nguyen, H., Le, C., Nguyen, H. Acute lyme infection presenting with amyopathic dermatomyositis and rapidly fatal interstitial pulmonary fibrosis: a case report. (2010) *J Med Case Rep* 4:187.. [Pubmed](#) | [Crossref](#) | [Others](#)
- 263) Silva, M.T., Sophar, M., Howard, R.S. Neuroborreliosis as a cause of respiratory failure. (1995) *J Neurol* 242(9): 604–607. [Pubmed](#) | [Crossref](#) | [Others](#)
- 264) Coyle, P.K., Dattwyler, R. Spirochetal infection of the central nervous system. (1990) *Infect Dis Clin North Am.* 4(4): 731-746. [Pubmed](#) | [Crossref](#) | [Others](#)
- 265) Gylfe, A., Wahlgren, M., Fahlén, L., et al. Activation of latent Lyme borreliosis concurrent with a herpes simplex virus type 1 infection. (2002) *Scand J Infect Dis* 34(12): 922-924. [Pubmed](#) | [Crossref](#) | [Others](#)
- 266) Lesniak, O.M., Belikov, E.S. [The classification of Lyme borreliosis (Lyme disease)]. (1995) *Ter Arkh.* 67(11): 49-51. [Pubmed](#) | [Crossref](#) | [Others](#)
- 267) Miklossy, J., Kasas, S., Zurn, A.D., et al. Persisting atypical and cystic forms of *Borrelia burgdorferi* and local inflammation in Lyme neuroborreliosis. (2008) *J Neuroinflammation* 5(1): 40. [Pubmed](#) | [Crossref](#) | [Others](#)
- 268) Nafeev, A.A., Klimova, L.V. [Clinical manifestations of neuroborreliosis in the Volga region]. (2010) *Ter Arkh* 82(11): 68-70. [Pubmed](#) | [Crossref](#) | [Others](#)
- 269) Pachner, A.R. Spirochetal diseases of the CNS. (1986) *Neurol Clin.* 4(1): 207-222. [Pubmed](#) | [Crossref](#) | [Others](#)
- 270) Pfister, H.W., Preac-Mursic, V., Wilske, B., et al. Latent Lyme neuroborreliosis: presence of *Borrelia burgdorferi* in the cerebrospinal fluid without concurrent inflammatory signs. (1989) *Neurology* 39(8): 1118-1120. [Pubmed](#) | [Crossref](#) | [Others](#)
- 271) Schmid, G.P. Epidemiology and clinical similarities of human spirochetal diseases. (1989) *Rev Infect Dis* 11(Suppl 6): S1460- S1469. [Pubmed](#) | [Crossref](#) | [Others](#)
- 272) Yoshinari, N.H., de Barros, P.J., Bonoldi, V.L., et al. [Outline of Lyme borreliosis in Brazil]. (1997) *Rev Hosp Clin Fac Med Sao Paulo* 52(2): 111-117. [Pubmed](#) | [Crossref](#) | [Others](#)
- 273) Avitabile, C., Harris, M., Chowdhury, D. Cardiac Magnetic Resonance Characterizes Myocarditis in a 16-Year-Old Female With Lyme Disease. (2016) *World J Pediatr Congenit Heart Surg* 7(3): 394-396. [Pubmed](#) | [Crossref](#) | [Others](#)
- 274) Blaut-Jurkowska, J., Olszowska, M., Kaznica-Wiatr, M., et al. [Lyme carditis]. [Article in Polish]. (2015) *Pol Merkur lekarski* 39(230): 111–115. [Pubmed](#) | [Crossref](#) | [Others](#)
- 275) Kuchynka, P., Palecek, T., Havranek, S., et al. Recent-onset dilated cardiomyopathy associated with *Borrelia burgdorferi* infection. (2015) *Herz* 40(6): 892-897. [Pubmed](#) | [Crossref](#) | [Others](#)
- 276) Plocarová, K. [Inflammatory borrelia - associated dilated cardiomyopathy]. [Article in Czech]. (2013) *Vnitr Lek* 59(12): 1107-1110. [Pubmed](#) | [Crossref](#) | [Others](#)
- 277) Yoshinari, N.H., de Barros, P.J., Bonoldi, V.L., et al. [Outline of Lyme borreliosis in Brazil]. (1997) *Rev Hosp Clin Fac Med Sao Paulo* 52(2): 111-117. [Pubmed](#) | [Crossref](#) | [Others](#)
- 278) Avitabile, C., Harris, M., Chowdhury, D. Cardiac Magnetic Resonance Characterizes Myocarditis in a 16-Year-Old Female With Lyme Disease. (2016) *World J Pediatr Congenit Heart Surg* 7(3): 394-396. [Pubmed](#) | [Crossref](#) | [Others](#)
- 279) Blaut-Jurkowska, J., Olszowska, M., Kaznica-Wiatr, M., et al. [Lyme carditis]. (2015) *Pol Med J* 39(230) :111–115. [Pubmed](#) | [Crossref](#) | [Others](#)
- 280) Kuchynka, P., Palecek, T., Havranek, S., et al. Recent-onset dilated cardiomyopathy associated with *Borrelia burgdorferi* infection. (2015) *Herz* 40(6): 892-897. [Pubmed](#) | [Crossref](#) | [Others](#)
- 281) Plocarová, K. [Inflammatory borrelia - associated dilated cardiomyopathy]. (2013) *Vnitr Lek* 59(12): 1107-1110. [Pubmed](#) | [Crossref](#) | [Others](#)