

EPIDEMIOLOGICAL, CLINICAL AND PARACLINICAL ASPECTS OF LYME DISEASE IN BIHOR COUNTY BETWEEN 2007-2011

Csep A.*

*University of Oradea, Faculty of Medicine and Pharmacy, 3-5 1 Decembrie str.
e-mail: csep.andrei@gmail.com

Abstract

Lyme disease is the most common tick-borne disease in the Northern Hemisphere. Borrelia is transmitted to humans by the bite of infected ticks belonging to a few species of the genus Ixodes ("hard ticks"). 60 patients were included in this study, with the diagnosis of Lyme disease, from Bihor county, most of them came from different locations near Oradea like, Borod, Bratca, Ponoara and Sighistel. The tick bite localisation was frequently in the inferior legs and on the breast (35 cases). The most frequent symptom was erythema migrans (71%), often accompanied with fever and headache. The most common used therapy was with amoxiciline 1500mg/day or doxycycline 200mg/day in monotherapy for 3 weeks.

Key words: Lyme disease, *Borellia burgdorferi*, infected ticks, western blot

INTRODUCTION

Lyme disease is an emerging infectious disease caused by at least three species of bacteria belonging to the genus *Borrelia*. Lyme disease is the most common tick-borne disease in the Northern Hemisphere. *Borrelia* is transmitted to humans by the bite of infected ticks belonging to a few species of the genus *Ixodes* ("hard ticks"). (Auwaerter P.G., Aucott J., Dumler J.S., 2004). Early symptoms may include fever, headache, fatigue, and a characteristic circular skin rash called erythema migrans. Left untreated, later symptoms may involve the joints, heart, and central nervous system. (Rapini Ronald P. et al., 2007).

Lyme disease can affect multiple body systems and produce a range of symptoms. Not all patients with Lyme disease will have all symptoms, and many of the symptoms are not specific to Lyme disease, but can occur with other diseases, as well. The incubation period from infection to the onset of symptoms is usually one to two weeks, but can be much shorter (days), or much longer (months to years). Symptoms most often occur from May through September, because the nymphal stage of the tick is responsible for most cases. (Hess A. et al., . 1999), (Samuels D.S., Radolf, J.D., 2010).

The classic sign of early local infection with Lyme disease is a circular, outwardly expanding rash called erythema chronicum migrans (also erythema migrans or EM), which occurs at the site of the tick bite three to thirty days after the tick bite. The rash is red, and may be warm, but

is generally painless. Classically, the innermost portion remains dark red and becomes indurated the outer edge remains red; and the portion in between clears, giving the appearance of a bullseye. However, partial clearing is uncommon, and the bullseye pattern more often involves central redness. (Dandache P., Nadelman R.B., 2008), (Edlow J.A., 2007)



Fig.1. The typical sing of infected tick bite

Within days to weeks after the onset of local infection, the *Borrelia* bacteria may begin to spread through the bloodstream. EM may develop at sites across the body that bear no relation to the original tick bite. Another skin condition, which is apparently absent in North American patients, but occurs in Europe, is borrelial lymphocytoma, a purplish lump that develops on the ear lobe, nipple, or scrotum. Other discrete symptoms include migrating pain in muscles, joints, and tendons, and heart palpitations and dizziness caused by changes in heartbeat. (Johnson R.C., 1996).

Various acute neurological problems, termed neuroborreliosis, appear in 10–15% of untreated patients. These include facial palsy, which is the loss of muscle tone on one or both sides of the face, as well as meningitis, which involves severe headaches, neck stiffness, and sensitivity to light. Radiculoneuritis causes shooting pains that may interfere with sleep, as well as abnormal skin sensations. Mild encephalitis may lead to memory loss, sleep disturbances, or mood changes. (Chabria S.B., Lawrason J., 2007), (Mulleger R.R., 2004)

After several months, untreated or inadequately treated patients may go on to develop severe and chronic symptoms that affect many parts of the body, including the brain, nerves, eyes, joints and heart. Many disabling symptoms can occur, including permanent paraplegia in the most extreme cases. (Hu MD, Linden, 2009), (Puius Y.A., Kalish R.A., 2008).

Several forms of laboratory testing for Lyme disease are available, some of which have not been adequately validated. The most widely used tests are serologies, which measure levels of specific antibodies in a

patient's blood. These tests may be negative in early infection, as the body may not have produced a significant quantity of antibodies, but they are considered a reliable aid in the diagnosis of later stages of Lyme disease. (Steere AC, et al., 2003).

Serologic tests for Lyme disease are of limited use in people lacking objective signs of Lyme disease because of false positive results and cost.(Wang G. Et al., 1999). The serological laboratory tests most widely available and employed are the Western blot and ELISA. A two-tiered protocol is recommended by the CDC: the sensitive ELISA test is performed first, and if it is positive or equivocal, then the more specific Western blot is run. The reliability of testing in diagnosis remains controversial. (Seltzer E.G., et al., 2000). Studies show the Western blot IgM has a specificity of 94–96% for patients with clinical symptoms of early Lyme disease. The initial ELISA test has a sensitivity of about 70%, and in two-tiered testing, the overall sensitivity is only 64%, although this rises to 100% in the subset of people with disseminated symptoms, such as arthritis. ELISA testing, however, is typically done against region-specific epitopes, and may report a false negative if the patient has been infected with *Borrelia* from another region than that in which the patient is tested. (Stanek G., Strle F., 2008).

Erroneous test results have been widely reported in both early and late stages of the disease, and can be caused by several factors, including antibody cross-reactions from other infections, including Epstein-Barr virus and cytomegalovirus, as well as herpes simplex virus. (Ryan KJ., Ray CG. 2004). The overall rate of false positives is low, only about 1 to 3%, in comparison to a false negative rate of up to 36% using two-tiered testing. Polymerase chain reaction (PCR) tests for Lyme disease have also been developed to detect the genetic material (DNA) of the Lyme disease spirochete. PCR tests are susceptible to false positive results from poor laboratory technique. Even when properly performed, PCR often shows false negative results with blood and cerebrospinal fluid (CSF) specimens. (Cairns V., Godwin J., 2005), (Fahrer H. Et al., 1998), (Fallon B.A., Nields J.A., 1994).

MATERIAL AND METHOD

The aim of this paper is to analyse the epidemiological, clinical and paraclinical characteristics of the patients diagnosed with Lyme disease in the Bihor county between 01.01.2007-01.10.2011. The positive diagnosis was made with the serological tests (ELISA, Western blot- IgM and IgG).

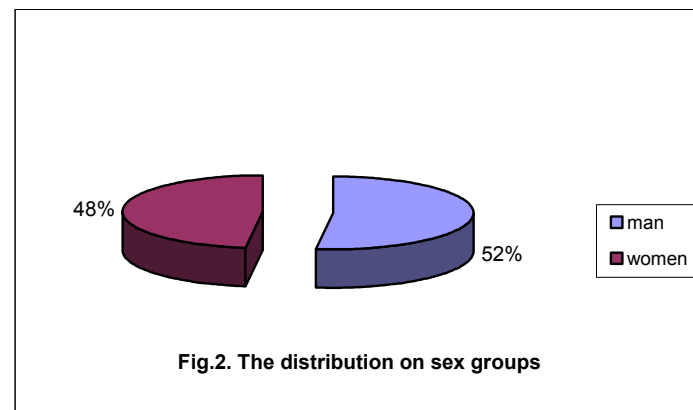
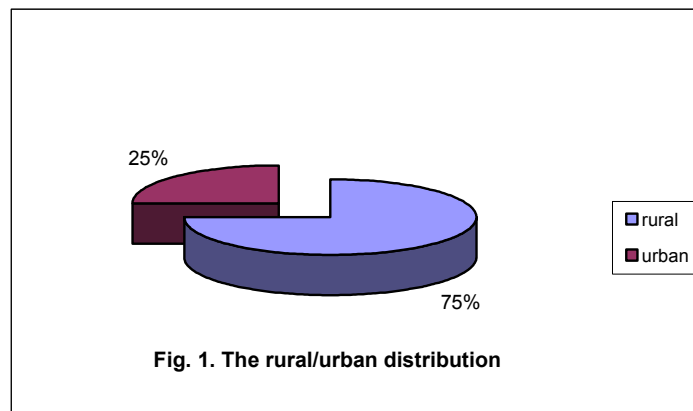
RESULTS AND DISCUSION

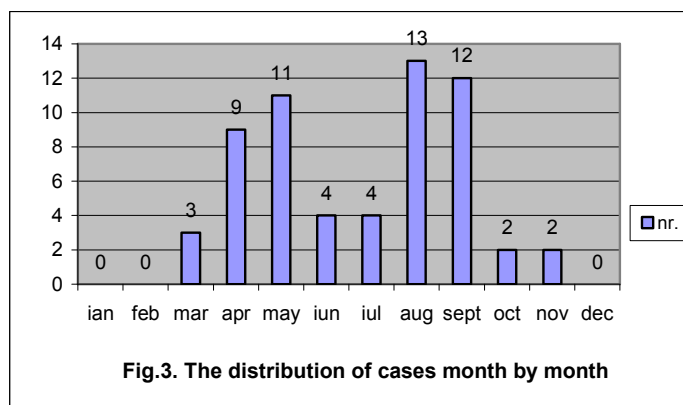
60 patients were included in this study, with the diagnosis of Lyme disease, from Bihor county, most of them came from different locations in Bihor county like, Borod, Borozel, Bratca, Ponoara, and Sighistel.

The rural/urban distribution of the patients show us that most of them came from the rural environment (75%) and only 25% from Oradea. (Fig.1)

There weren't noticed significant differences as regards the division of patients on sex groups (52% man, 48% women). (Fig. 2)

Most patients were diagnosed during spring especially in april and may (20 cases) and the rest in august-september (25 cases). (Fig. 3)





The tick bite localisation was frequently in the inferior legs and on the breast (35 cases). Another localisations were on the neck (6 cases), head (9 cases), ears (7 cases) and forearms (3 cases).

The most frequent symptom was erythema migrans (71%), often accompanied with fever and headache. The distribution on sex groups shows us that the most frequent period to contract Lyme disease was between 35-45 years old. An inflammatory syndrome was inconstantly present, and we noticed a high number of leucocytes and granulocytes 30%. The most common used therapy was with amoxiciline 1500mg/day or doxycycline 200mg/day in monotherapy for 3 weeks. The erythema migrans disappeared after 2 weeks in 7 cases (11,66%), 3 weeks in 36 cases (60%), 4 weeks in 17 cases (28,33%).

CONCLUSIONS

The tick bite localisation was frequently in the inferior legs and on the breast (35 cases).

The most frequent symptom was erythema migrans (71%), often accompanied with fever and headache.

The most common used therapy was with amoxiciline 1500 mg/day or doxycycline 200 mg/day in monotherapy for 3 weeks.

The erythema migrans disappeared in 3 weeks in 60% of cases using antibiotherapy.

REFERENCES

1. Auwaerter PG, Aucott J, Dumler JS (January 2004). "Lyme borreliosis (Lyme disease): molecular and cellular pathobiology and prospects for prevention, diagnosis and treatment.
2. Cairns V, Godwin J (2005). "Post-Lyme borreliosis syndrome: a meta-analysis of reported symptoms". *Int J Epidemiol* 34 (6): 1340–1345.
3. Chabria SB, Lawrason J (2007). "Altered mental status, an unusual manifestation of early disseminated Lyme disease: A case report". *Journal of Medical Case Reports* 1 (1): 62..
4. Dandache P, Nadelman RB (June 2008). "Erythema migrans". *Infect. Dis. Clin. North Am.* 22 (2): 235–60, vi..
5. Edlow JA (2007-01-25). "Lyme disease". eMedicine. <http://www.emedicine.com/derm/topic536.htm>. Retrieved 2007-08-21.
6. Fahrer H, Sauvain MJ, Zhioua E, Van Hoecke C, Gern LE (1998). "Longterm survey (7 years) in a population at risk for Lyme borreliosis: what happens to the seropositive individuals?". *Eur. J. Epidemiol.* 14 (2): 117–123.
7. Fallon BA, Nields JA (1994). "Lyme disease: a neuropsychiatric illness". *The American journal of psychiatry* 151 (11): 1571–1583..
8. Hess A, Buchmann J, Zettl UK, *et al.* (1999). "*Borrelia burgdorferi* central nervous system infection presenting as an organic schizophrenia-like disorder". *Biol. Psychiatry* 45 (6): 795.
9. Hu MD, Linden (2009). "Clinical Manifestations of Lyme Disease in Adults". *UpToDate*. UpToDate
10. Johnson RC (1996). "Borrelia". *Baron's Medical Microbiology* (Baron S *et al.*, eds.) (4th ed.). Univ of Texas Medical Branch. ISBN 0-9631172-1-1. <http://www.ncbi.nlm.nih.gov/books/bv.fcgi?&rid=mmed.section.1965>.
12. Mullegger RR (2004). "Dermatological manifestations of Lyme borreliosis". *Eur J Dermatol* 14 (5): 296–309..
13. Puius YA, Kalish RA (June 2008). "Lyme arthritis: pathogenesis, clinical presentation, and management". *Infect. Dis. Clin. North Am.* 22 (2): 289–300,
14. Rapini, Ronald P.; Bologna, Jean L.; Jorizzo, Joseph L. (2007). *Dermatology: 2-Volume Set*. St. Louis: Mosby. ISBN 1-4160-2999-0.
15. Ryan KJ, Ray CG (editors) (2004). *Sherris Medical Microbiology* (4th ed.). McGraw Hill. pp. 434–437. ISBN 0838585299.
16. Samuels DS; Radolf, JD (editors) (2010). *Borrelia: Molecular Biology, Host Interaction and Pathogenesis*. Caister Academic Press. ISBN 978-1-904455-58-5.
17. Seltzer EG, Gerber MA, Cartter ML, Freudigman K, Shapiro ED (February 2000). "Long-term outcomes of persons with Lyme disease". *JAMA* 283 (5): 609–16.
18. Stanek G, Strle F (June 2008). "Lyme disease: European perspective". *Infect. Dis. Clin. North Am.* 22 (2): 327–39, vii. ▲ Halperin JJ (June 2008). "Nervous system Lyme disease".
19. Steere AC, Sikand VK, Schoen RT, Nowakowski J (2003). "Asymptomatic infection with *Borrelia burgdorferi*". *Clin. Infect. Dis.* 37 (4): 528–532.
20. Wang G, van Dam AP, Schwartz I, Dankert J (October 1999). "Molecular typing of *Borrelia burgdorferi* sensu lato: taxonomic, epidemiological, and clinical implications". *Clin. Microbiol. Rev.* 12 (4): 633–53.