Review of the monograph «Lyme-borreliosis» by M.A. Andreychyn, M.M. Korda, M.I. Shkil'na, O.L. Ivakhiv.

Ternopil: TNMU, 2021. — 376 p.

In the conditions of the COVID-19 pandemic, the attention of specialists to other dangerous infectious diseases has significantly weakened. Lyme borreliosis, which is characterized by the constant expansion of the range of the pathogen and the increase in the level of morbidity in the world, was also «disguised» among such ailments. According to the forecast of experts, it gradually acquires the signs of a pandemic infection, and therefore causes more and more concern in various countries.

At the I.Ya. Horbachevskyi Ternopil National Medical University, a large team of scientists has been engaged in the over-ten-year Lyme-borreliosis research headed by Academician of NAS of Ukraine, Honored Worker of Science and Technology of Ukraine, Doctor of Medical Sciences, Professor M.A. Andreychyn and the corresponding member of NAS of Ukraine, Honored Worker of Science and Technology of Ukraine, Doctor of Medical Sciences, Professor M. M. Korda. In agreement with the Ministry of Health of Ukraine, the Center for Study of Lyme-borreliosis and other tick-borne infections was established in 2017. Within a short time, it was possible to equip the Center's laboratory with the necessary equipment and to develop research methods that meet the international standards thanks to the cooperation with scientists of the State Higher School named after Pope John Paul II (Biała Podlaska, Poland), the Institute of Ru-

Citation: Spivak M.Ya. Review of the monograph "Lyme-borreliosis" by M.A. Andreychyn, M.M. Korda, M.I. Shkil'na, O.L. Ivakhiv. — Ternopil: TNMU, 2021. — 376 p. *Microbiological journal.* 2022 (2). P. 73—75.

ral Medicine (Lublin, Poland), and the Laboratory «IGeneX Inc.» (Milpitas, California, USA), as well as with researchers from Finland, France, Spain, and other countries. In 2019, the Ternopil National Medical University became the winner of the Seeding Labs Grant Program (Boston, USA) and received modern equipment for that laboratory. Also, thanks to the efforts of this powerful team, the monograph «Lyme borreliosis» was published at the end of 2021.

The book includes 7 chapters, which are in a logical relationship. The main attention is paid to the etiology, epidemiology, clinical manifestations, diagnosis, therapy, and prevention of Lyme-borreliosis. Along with generalizing the achievements of world science, the results of the authors' research are highlighted as well. In addition to today's data on the morphology of Borrelia and their species related to ticks, the current ecological and geographical characteristics of the varieties of *B. burgdorferi sensu lato* and the peculiarities of the organization of its genome are given.

The reader will be able to learn new data about ticks as the main reservoir and carriers of Borrelia, their reproduction, nutrition, and development as well as infection at various stages of development. The created medical geoinformation system is of great practical importance, especially valuable for registering cases of human infection in terms of diagnosing diseases and carrying out anti-epidemic measures. The authors offered effective means of collecting ticks in the environment, investigated their infection with Borrelia and other pathogens in various endemic areas, professional risks of infection, damage to organs and systems of the human body during this infection, and its combinations with other diseases.

The diagnosis of Lyme-borreliosis is supplemented with instrumental methods, in particular thermographic ones such as a non-invasive and harmless for the patient method of functional diagnosis, the basis of which is the remote registration of the human body's infrared radiation. The ability to detect disease using thermograms is based on the fact that various pathological conditions affect both the distribution and the intensity of thermal (infrared) radiation. Ternopil researchers of infectious diseases adopted this method a long time ago and developed thermosemiotics for viral hepatitis, SARS, dysentery, erysipeloid, leptospirosis, and other infections. The authors convincingly proved its value for the examination of patients suffering from erythema migrans during Lyme borreliosis. Moreover, thermography turned out to be especially useful for the diagnosis of the erythematous and asymptomatic forms of the disease, since it always registers local «warming» around the place of tick suction, even in the absence of visible local changes on the skin. Basing on the data obtained, the authors developed thermographic criteria for the diagnosis of Lyme borreliosis, which are expedient to use in clinical practice.

The awareness of different categories of the population regarding Lyme-borreliosis was investigated in detail. With the help of questionnaires, 1,070 foresters from seven regions of Ukraine were interviewed as they belong to groups with a proffessional risk of infection. It turned out that the majority of forestry workers do not have the necessary knowledge about tick infections and their prevention. Many of them have been diagnosed with chronic Lyme disease and treated.

For the first time, a number of epidemiological and clinical features of erythematous and non-erythematous forms of Lyme-borreliosis have been elucidated. The clinic-pathogenetic features of damage to the skin, musculoskeletal system, cardiovascular and nervous systems are described in detail. The aggravating effect of the erythematous form of Lyme-borreliosis on the course of pulmonary tuberculosis has been proven.

A lot of attention is paid to the methods of specific diagnosis of Lyme borreliosis, with an emphasis on the use of a two-stage serological

method with the sequential setting of the ELISA test and immunoblotting, which makes it possible to eliminate false-positive research results. For the first time in Ukraine, the multiplex indirect immunofluorescence reaction was used via the application of biochip technology. The high informativeness of this method is shown, especially for the differential diagnosis of Lyme-borreliosis among other infectious diseases. At the same time, the authors of the monograph reasonably believe that the most promising method for diagnosing Lyme-borreliosis is the detection of specific Borrelia DNA fragments in biological material with help of the polymerase chain reaction. It was by this method that the DNA of *B. burgdorferi s.l.* was detected in the blood of 11.6% of women with pregnancy pathology. l. In our opinion, these studies should be continued in order to find out the possible etiological role of this specified pathogen.

The authors made clarifications and additions to the currently accepted treatment regimens for Lyme-borreliosis patients with antibiotics, taking into account their own experience of their use. Traditional etiotropic and pathogenetic therapies are complemented by the use of honeydew stevia, which provides a reduction in the frequency of the phototoxic drug reaction of the widely used doxycycline hydrochloride by almost 3.8 times. At the same time, the prevention of the desease is covered very briefly. It is desirable to continue research in this direction.

The monograph is completed with conclusions and proposals that summarize the data of all its sections and open prospects for further scientific research.

The book is richly illustrated with graphic images and digital tables, which significantly facilitate the perception of the material. At the end of each chapter, there is a list of literature used. The content, preface, conclusions, and proposals are duplicated in English, which can expand the circle of interested readers.

The monograph is undoubtedly an important step in the study of the problem of Lyme borreliosis. It will be valuable in the work of scientists and practical epidemiologists, infectious disease specialists, family doctors, therapists, cardiologists, rheumatologists, neurologists, microbiologists, immunologists, and laboratory technicians.

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