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Research Article

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Retrospective Analisis of Clinical Case of Erhlichiosis

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ABSTRACT

Relevance: The number of cases of ehrlichiosis is increasing, which is caused by more frequent testing for this infectious disease. Neurological manifestations are observed in about 20% of diagnosed cases. The article presents a retrospective analysis of a clinical case of the consequences of ehrlichiosis meningoencephalitis and the difficulties in establishing the etiology of the disease, its complications.

Purpose of the Work: To describe the clinical and laboratory results of a meta-analysis of meningoencephalitis caused by bacteria of the genus Erhlichia with the subsequent development of persistent neurological changes, joint syndrome and recurrent dermatitis.

Materials and Methods: A retrospective analysis of data from a patient with Ehrlichia-induced meningoencephalitis was conducted. The study was conducted using the following methods: collection of complaints and patient history, objective examination data, instrumental and laboratory research methods.

Results and Discussion: The clinical case of patient T., 50 years old, with persistent neurological changes that occurred as a result of a tick bite; polyarthritis; recurrent dermatitis, which significantly affect the patient's quality of life, is described. The patient, after several neurological complications, was treated ex juvantibus with doxycycline. History, clinical and instrumental data, and later, analysis for the presence of Ehrlichia/Anaplasma plagocytophilum antibodies, Ig G, allowed to establish the etiology of the disease. Against the background of colchicine treatment, there is a decrease in neurological symptoms, the disappearance of the inflammatory mechanism of pain in the joints, and fewer manifestations of recurrent dermatitis.

Conclusions: This clinical case demonstrates the observation of the course of complications of ehrlichiosis. Etiotropic therapy was carried out untimely, because the formation of the etiology of the disease at that time was complicated by the lack of the ability to conduct appropriate studies and subsequently by the patient's financial capabilities. Neurological disorders, joint syndrome, recurrent dermatitis, which persisted despite the etiotropic therapy, became less pronounced against the background of taking colchicine, which improved the quality of life. The use of such drugs may indicate immune disorders after suffering ehrlichiosis.

Keywords: Ehrlichia, Meningoencephalitis, Etiotropic Therapy, Colchicine

Introduction

Ehrlichiosis is a group of transmissible infectious diseases of humans and mammals caused by intracellular pathogens - bacteria of the genus Ehrlichia. There is an increase in the diagnosis of clinically confirmed cases of the disease. People in occupational risk groups are affected more often. Registered cases are a small percentage of the total number of cases, due to the subclinical course of most cases of the disease. The highest level of seropositivity is in European countries. Ehrlichiosis affects people of all ages (the average age of patients is about 50 years), this disease is diagnosed in men almost 4 times more often than in women. Mortality reaches 3-5% in granulocytic anaplasmosis (GAL) and 7-10% in monocytic ehrlichiosis (MEL). With early diagnosis and timely treatment, the mortality rate does not exceed 5% and 3%, respectively. After the disease, long-term, stable immunity is formed, repeated diseases of people with ehrlichiosis have not been described. The possibility of long-term persistence of ehrlichia in the human body and the chronic course of infection observed in animals is not excluded. In different geographical regions, the circulation of ehrlichia species is associated with species of ixodid ticks (family Ixodes)

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and species diversity of large and small mammals, which are considered as a reservoir of pathogens. A study of tick populations in Ukraine showed that the infection rate of ehrlichia in ticks of the species Injuries: 5 toes on both feet, right shoulder, left tibia, and left talus (against a background of syncopal states). is 3.1%, and that of the species Dermacentor reticulatus is 0.7%. After a tick bite, the incubation period (before the manifestation of the disease) can last from 1 to 21 days, and the average duration of this period is 7-10 days. The duration of clinical manifestations (fever period) varies significantly and in the absence of adequate treatment is from 3 to 11 weeks. When etiotropic therapy is carried out, body temperature normalizes within one week [1-2].

The main taxa of the Ehrlichia classification are as follows: kingdom – Bacteria, phylum – α- Proteobacteria, class – Rickettsiales, family – Anaplasmataceae, which includes 4 genera: Anaplasma, Ehrlichia, Neorickettsia, Wolbachia. Ehrlichia pathogenicity factors and mechanisms of pathogenesis of ehrlichiosis of diseases caused by Ehrlichia continue to be studied. Ehrlichia infection occurs through the saliva of an infected tick that has sucked. The entrance gate of infection is the skin at the site of the tick bite, where the primary affect may occur. There are isolated cases of human infection due to transfusion of blood products and surgical interventions. When developing Ehrlichia infection, tissues and organs rich in phagocytic cells are most affected – spleen, lymph nodes, bone marrow, blood vessels, lungs. It is in them that the deepest cell damage and the formation of infectious granulomas are detected. Depending on the type of affected blood cells, two forms of ehrlichiosis infection are conventionally distinguished: MEL with a characteristic lesion of monocytes and macrophages, and GAL with the multiplication of pathogens, mainly in granulocytes [3-4].

Multisystemic effects in ehrlichiosis infection are clinically manifested by a syndrome of general infectious intoxication (increased body temperature, chills, headache, dizziness, myalgia, arthralgia, decreased appetite, nausea, vomiting, general weakness, arterial hypotension, confusion, etc.), signs of impaired hemolymphopoiesis and blood rheological characteristics (leucocytopenia, thrombocytopenia, lymphocytosis, monocytopenia, shift of the leukocyte formula to the left, increased erythrocyte sedimentation rate) and liver damage (increased size, increased levels of transaminases, alkaline phosphatase, etc.). Rash is an infrequent symptom: macular, maculopapular, rarely petechial. More common in patients with MEL. Neurological symptoms - the occurrence of meningoencephalitis is more common in patients with MEL (up to 20%). Differential diagnosis is carried out with babesiosis, borreliosis, meningitis, infectious mononucleosis, cytomegalovirus infection, dengue fever, malaria, bacterial sepsis, endocarditis, systemic lupus erythematosus, hemophagocytic lymphohistiocytosis, lymphoproliferative diseases, hepatitis, Kawasaki disease, leptospirosis, Q fever, toxic shock, typhoid fever [5-9].

Purpose of the Study

To study the features of the diagnosis of ehrlichiosis infection, to provide retrospective observations of a clinical case of this disease. Today, all patients with a history of tick bites are subject to laboratory testing for tick-borne encephalitis, borreliosis, anaplasmosis and ehrlichiosis. The diagnostic criteria for ehrlichiosis are based on epidemiological, clinical and laboratory data. For the etiological laboratory diagnosis of ehrlichiosis, the following are used as the main ones: immunological methods (ELISA, RNIF, RIF, immunoblotting), isolation of pathogen strains when grown on special cultures of eukaryotic cells, PCR indication of specific fragments of the ehrlichia genome, microscopic detection of intracytoplasmic formations (morulae) - microcolonies of the pathogen in target cells. In the case of transferred meningoencephalitis, a laboratory examination of cerebrospinal fluid is used. Nonspecific laboratory tests: complete blood count: leukopenia in 2/3 of cases in the 1st week, thrombocytopenia and, less often, anemia, relative absolute lymphocytosis in the 2nd week of the disease, normal values do not exclude the disease; liver tests are usually normal, except in critical conditions [10].

PCR

Sensitivity and specificity 95-100% in the first 7 days of the disease, available in private laboratories. The diagnosis is established with a more than 4-fold increase in the Ig G titer between acute and convalescent (sensitivity 80-86%), negative in the early stage (7-10 days), antibiotics suppress antibody production, Ig M is less specific, positive Ig G persists for more than a year. The results of Ig M alone should not be used in laboratory diagnostics.

Immunohisto Chemistry

Detection of antigens in tissues (bone marrow, spleen) during biopsy, autopsy is rarely used.

Cultural Method

Requires cell cultures, long (2-3 weeks), is carried out before antibiotic therapy. For instrumental examination in this case, MRI of the brain is performed.

The tactics of managing such patients include etiotropic, symptomatic therapy both in hospital and outpatient settings. Hospitalization of patients is carried out according to clinical feasibility. The decisive role in the treatment of ehrlichiosis is given to etiotropic therapy, which is currently carried out with tetracycline antibiotics, where preference is given to doxycycline 100 mg 2 times a day for 5-14 days. In cases where patients have contraindications to the use of doxycycline (for example, in the presence of allergies, pregnancy), it is recommended to use drugs from the group of rifampicin derivatives (rifampin) 300 mg orally or by injection every 12 hours 10 mg/kg orally or by injection every 12 hours for 7-10 days. Prevention today consists of measures to reduce the risk of tick bites on people, periodic examinations of exposed areas of the body and a complete examination of the entire body; if a tick gets on the skin, remove it and take it to the laboratory for examination, conduct emergency prophylaxis with a short course of antibiotic therapy and be observed by an infectious disease doctor for 21 days.

Materials and Methods

Clinical Case

Patient T., 50 years old, has been seen by a neurologist for many years with complaints of: constant headache, often with

a feeling of pressure on the eyes, ears with nausea, attacks of vomiting; dizziness, worsening of the condition in cold and hot weather; unsteady gait; general weakness; difficulty swallowing dry and solid food; increased fatigue; decreased memory and attention; attacks with severe headache, palpitations, increased blood pressure, feeling of shortness of breath, fear up to 2-3 times a week, accompanied by vomiting, frequent urination; periodic rash on the extensor surface of the 2nd and 3rd metacarpophalangeal joints of the right hand; attacks with short-term loss of consciousness without convulsions; pain along the spine (Figure 1-2).

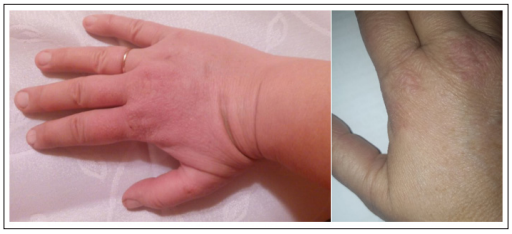

Figure 1-2: Rash on the Extensor Surface of the Right Hand (2016, 2025).

History of the disease: considers herself sick since July 1994, when she was bitten by a tick. Prophylactic treatment with doxycycline 100 mg 1 time per day for 4 days was carried out. The patient was worried about chills, malaise. Later, asthenic syndrome developed, pronounced weakness and fatigue, increasing headache intensity, deterioration of learning ability, a rise in body temperature in the evening to subfebrile levels, decreased appetite, nausea in the morning, drowsiness (more in the morning). The condition deteriorated sharply at the end of October, meningeal syndrome developed. The patient was hospitalized to the neurological department of the district hospital, where treatment with glucocorticosteroids, detoxification therapy, antibiotic therapy with gentamicin was carried out. Since the bacteriological laboratory was not working at that time in the clinic, the examination of cerebrospinal fluid was not carried out.

The patient was discharged from the hospital after improvement under the supervision of a neurologist. The patient was troubled by bradyphrenia for some time. Periodically treated in neurological departments. For several years, he was troubled by iron deficiency anemia, increased ESR (maximum up to 29 mm/h) and CRP (maximum up to 12 mg/ml), which correlated with the appearance of short-term joint syndrome (up to 3-4 weeks) with an inflammatory rhythm). Independent treatment with doxycycline 100 mg 2 times a day for 10 days in 2008 provided relief from the condition (normalization of hemoglobin, erythrocytes, CRP levels). In the same year, attacks of syncope appeared up to 2-3 times a year without aura, the consequences of which were post-traumatic arthritis and fractures. A few more years later - a recurrent rash on the extensor surface of the 2nd and 3rd metacarpophalangeal joints of the right hand. Bleeding gums. Nasal discharge in the form of bloody crusts.

Life History

Venereal diseases, active tuberculosis, viral hepatitis A, diabetes mellitus denies. Infectious diseases: flu, scarlet fever, chickenpox, mumps, measles, rubella, SARS-Cov-2. Unhealthy habits denies. Allergic history: anesthetics, sodium thiosulfate, nimesulide, ranitidine, vitamin D. Surgical interventions: hymorotomy, appendectomy, cesarean section. Injuries: post-traumatic arthritis of the knee and ankle joints, fractures of the fifth toes of both feet, right humerus, left tibia, and left talus (against a background of syncopal states) (Figure-2).

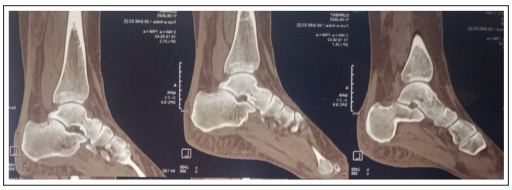

Figure-2: Fracture of the left tibia and talus.

On objective examination: general condition is relatively satisfactory. Constitution: normosthenic. Position: active. Consciousness: clear. Skin: signs of contact dermatitis on the extensor surface of 2,3 metacarpophalangeal joints. Mucous membranes are of normal color, clean. Peripheral lymph nodes are not enlarged. Musculoskeletal and muscular systems: pain during palpation paravertebral along the spine with an accent in the cervical region, swelling of the ankle joints, moderate soreness in them. Cardiovascular system: heart sounds are muffled, rhythmic, accent of the II tone on the aorta and pulmonary trunk, systolic murmur at the apex and 5th point, pericardial friction rub. Pulse of satisfactory filling and tension, 79 in 1 min., blood pressure 123/89 mm Hg. Respiratory system: chest of regular shape. Percussion: pulmonary sound. Auscultation: breathing is hard, dry single rales in the lower parts. Digestive system: tongue moist, clean. Abdomen symmetrical, soft on palpation, sensitive in the epigastrium. Liver palpable along the edge of the costal arch. Spleen not palpable. Stool, urination not disturbed. Foot edema.

Neurological Status

Consciousness clear. No meningeal signs. Palpable fissures D=S, pupils D=S. Eyeball movement limited up and out, painful. Mann symptom moderately positive. Nystagmus in extreme horizontal leads, more when looking to the left. Face with asymmetry. Tongue deviated to the left. Muscle strength, tone normal. Tendon reflexes D≤S, lively. Left-sided hemihypesthesia. Unsteady in Romberg's pose. Asthenic. Emotionally labile. Pain when palpating paravertebral points along the spine. Tense muscles of the back, neck.

Diagnosis

Consequences of a previous meningoencephalitis (associated with Ehrlichia/Anaplasma plagocytophilum) with pronounced cerebrospinal fluid-hypertensive syndrome with hydrocephalic crises, vegetative-vascular paroxysms of the sympatho-adrenal and vago-insular direction, left-sided sensorimotor insufficiency, syncopal states, pronounced vestibulo-ataxic syndrome against the background of an unstable form of cervical osteochondrosis, asthenic syndrome.

Results and Discussion

Given the complaints and observations of doctors, the patient had a tick bite; there was fever, chills, rash was not bothering, severe general malaise and headache, muscle pain was not bothering, decreased appetite. Cough was not bothering. Constant nausea,

more in the morning, epigastric pain. Diarrhea was not bothering. Lymphadenopathy of the submandibular, periauricular groups of lymph nodes. Fear of death during severe attacks of cerebrospinal fluid hypertension and autonomic dysfunction. Bleeding gums.

The patient underwent laboratory tests: iron deficiency anemia, increased ESR (maximum up to 29 mm/h) and CRP (maximum up to 12 mg/ml, which correlated with the appearance of short-term joint syndrome (up to 3-4 weeks) with an inflammatory rhythm). Normalization of indicators since 2008 after treatment with doxycycline.

The following tests were performed: rheumatoid factor, antibodies to citrullinated cyclic peptide, antibodies to B. burgdorferi Ig M and Ig G, angiotensin-converting enzyme, antistreptolysin-O, hepatitis B virus surface antigen, antibodies to hepatitis C virus, Wasserman reaction - negative. Chlamydia trachomatis by polymerase chain reaction (PCR) - not detected. There were no abnormalities in the biochemical blood test, lipid profile until 2025. Given the swallowing disorder, the appearance of pneumofibrosis (after SARS-Cov-2), joint syndrome with inflammatory rhythm, tests performed for systemic diseases with ANA 1:100. Data without abnormalities (given in Table 1).

Table 1: Systemic Diseases Package

Indicator	Result*
Double-stranded DNA (ANA-Screen), IgG antibodies	<0,2
Single-stranded DNA (ANA-Screen), IgG antibodies	<0,2
Scl-70 (ANA-Screen), IgG antibodies	<0,2
Jo-1 (ANA-Screen), IgG antibodies	<0,2
SS-A 52/60 (ANA-Screen), IgG antibodies	<0,2
SS-B (ANA-Screen), IgG antibodies	<0,2
Sm (ANA-Screen), IgG antibodies	<0,2
Chromatin (ANA-Screen),IgG antibodies	<0,2
Ribosomal protein (ANA-Screen), IgG antibodies	<0,2
Sm/RNP (ANA-Screen), IgG antibodies	<0,2
RNP (ANA-Screen), IgG antibodies	<0,2
Centromere B (ANA-Screen), IgG antibodies	<0,2

*Reference result: Negative - up to 1.0; positive - ≥1.0

Due to the appearance of crusts on the nasal mucosa with bloody discharge, bleeding gums, ANCA analysis (myeloperoxidase (MPO), proteinase 3 (PR 3), glomerular basement membrane (GBM), Ig G was performed with a negative result (Table 2).

Table 2: ANCA Indicators

Indicator	Result
Glomerular basement membrane (GBM), Ig G antibodies	<2,0
Ig G antibodies to myeloperoxidase (MPO)	<2,0
Protease 3, Ig G antibodies (PR3)	<2,0

*Reference result: Negative - up to 20.0 U/ml; positive - ≥20.0 U/ml.

Instrumental diagnostic methods were performed, in particular, radiography of the hip, knee, ankle joints (03/23/2022): signs of deforming polyarthritis I st. Fractures confirmed by X-ray. Computed tomography (CT) of the chest (CT) (09/29/2022): basal pneumofibrosis, granuloma. Ultrasound examination (US): of the abdominal cavity (OCP) (09/30/2022) – polyp of the gallbladder duct, microurolithiasis.

X-ray of the gastrointestinal tract 04/19/2023: chronic gastroduodenitis, hiatal hernia.

Spirometry (10/04/2024) - no pathologies. Electrocardiograms (ECG) are performed: sinus rhythm, regular, sinus tachycardia, low voltage. MRI of the brain in 2018 - no pathologies. After suffering SARS-Cov-2, signs of cerebral angiopathy appeared (2022, 2024). On 02/14/2025, PCR was performed for Ehrlichia/Anaplasma plagocytophilum, Ig G. The result was positive: 1:128.

Improvement in the course of the disease - reduction in the intensity of manifestations (number and quality of attacks, headache, nausea, swallowing disorders, inflammatory rhythm of pain in the joints, rash): observed during pregnancy and treatment of complications of post-covid myopericarditis with colchicine. Given the recurrence of pericarditis, treatment with colchicine was continued, which improved the course of the consequences of the patient's neuroinfection. The patient also takes carvedilol (previously bisoprolol was used, which caused a feeling of weakness in the muscles, but improved the course of attacks of vegetative dysfunction), acetylsalicylic acid, coraxan.

Conclusion

This clinical case demonstrates late diagnosis of the consequences of an infectious disease with a favorable outcome. To date, one of the few works with a retrospective analysis of the course of the disease. The manifestations of the consequences of the disease were significantly reduced against the background of hormonal changes in connection with the patient's pregnancy and against the background of the use of colchicine, which significantly improved the quality of life. The use of such drugs may indicate immune disorders caused by the disease. Also, in our realities, diagnosis and treatment depend on increasing awareness of infections caused by Ehrlichia/Anaplasma plagocytophilum, the emergence of the ability to diagnose it and the material capabilities of the patient himself.

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