LYME BORRELIOSIS IN CHILDREN OF THE CITY OF MINSK

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The relevance of the study

1. The increase in the incidence of Lyme Borreliosis (LB) in Belarus in 2017 – 1,548 cases, among children-99 cases.
2. Difficulties of early and late clinical diagnosis.
3. Difficulties of early laboratory verification of the diagnosis (diagnostic titer of anti-Borrelia antibody becomes positive not earlier than 14 days from the moment of tick bite).
4. Late or non antibacterial prevention of LB leads to a long course of the infectious process and even the development of health disability (according to a number of authors, at least 10% of sick child population)
5. The prognosis for all stages of LB is different depending on adequate antibacterial therapy.

Research objective

To characterize the features of clinical indicators, to determine the effectiveness of antibacterial prevention and therapy in children with different stages of Lyme Borreliosis (LB).

Materials and methods

- The study included 110 children with LB from 1 to 18 years old who received treatment in Pediatric Infectious Hospital in Minsk from 2010 to 2017.
- The diagnosis of LB was identified on epidemiological history (tick bite), the clinical picture depending on the stage of the disease and the data of specific laboratory diagnosis: indirect immunofluorescence test with an antigen from Borrelia and the detection of antibodies in classes IgM and IgG to Borrelia by enzyme-linked immunosorbent assay (ELISA) in serum. In our laboratory in conducting ELISA used a set of reagents for the detection of IgG and IgM to causative agents of Ixodes tick-borne borreliosis – VIDAS Lyme IgM (LYM) – VIDAS Lyme IgG (LYG).

Picture 1. Outcomes of antibacterial prophylaxis of LB in the examined children

Results of research

Only 67 patients with LB have mentioned tick bite in their anamnesis. Preventive therapy with beta-lactam antibiotics for 5-10 days was prescribed only to 10 (9.1 %) patients. Subsequently, they developed an early localized stage (stage I) of the LB. Only one child received prevention of LB doxycycline, subsequently within 12 months after the bite he was not revealed any clinical symptoms.

Diagnosis of LB was diagnosed to 97 patients in stage I: form with erythema – 89 (80.9%) patients clinically, form without erythema - 8 (7.2%) children, based on serological examination, which was conducted a month after tick bite. In patients with the erythema form of LB along with skin manifestations were identified: regional lymphadenitis, common infectious syndrome. While half of the patients with form without erythema, applied to the medical institution only with symptoms of intoxication, and rest of the patients did not complain at all.

In 13 (11,8%) patients aged from 5 to 10 years LB was diagnosed in the stage of early dissemination (stage II), where 5 patients mentioned tick bite, but they didn't receive any preventive antibacterial therapy.

There were no significant differences in the indicators of the General blood test in patients with LB in comparison with the control group.

Summary

1. **There is a low wariness of parents and pediatricians regarding to development of LB after tick bite:** the proportion of children asking for medical health check about tick bite was only 60.9%, of the 43 who applied for tick bites, preventive antibacterial therapy was prescribed to only 10 patients.
2. **Low efficiency of amoxicillin and cefuroxime for prevention of LB** which requires further study.
3. **Most patients with LB enter the infectious hospital with early manifestations of the disease in the localized stage** (migrating erythema) with mild and moderate stage.
4. **Serological diagnosis of LB by ELISA in the early localized stage, due to the late appearance of antibodies gives a low information,** which requires the development of express methods in practice, including polymerase chain reaction (PCR).
5. **Indicators of General and biochemical blood tests in patients** with LB do not have specific changes, that complicates timely diagnosis of disease.
6. **Timely comprehensive adequate therapy with complete courses of antibacterial drugs can prevent the chronization of the disease,** the development of relapses and avoid late complications.
7. Detection of specific Ig in serum after antibacterial therapy is not an absolute proof of the activity of infections B.burgdorferis.l., **serological tests are not suitable for monitoring the effectiveness of chemotherapy (assessment of the body's rehabilitation).**

Picture 2. Clinical stages of LB in the examined children

Picture 3. Clinical forms of stage II of LB in children

Effectiveness of etiotropic treatment of LB in children

- Treatment of patients in the I stage of LB was carried out using: Amoxicillin, Ceftriaxone, Doxycycline, Azithromycin, Cefuroxime, Cefdinir, Cefixim for 14 days in age dosages. The effectivity of clinical and serological data of these patients was carried out 4-6 weeks after the end of antibacterial therapy. The dynamics of titer of anti-Borrelia antibody was determined of the indirect immunofluorescence test (14 patients) and ELISA (22 patients). In indirect immunofluorescence test 67% of children did not have of antibody to Borrelia, **the increase of titers from negative to 1:64 - 1:128 was noted in 33% of children. While 32% of patients had no antibody to Borrelia in the ELISA , 68% of patients had positive antibody titer IgM and IgG or only antibody of classes IgG .**
- Treatment of patients in the II stage of LB was carried out by Ceftriaxone-12 (92%) patients for 14-26 days, in 1 patient with lime-arthritis (gonitis) – Doxycycline for 14 days. The dynamics of titer of anti-Borrelia antibody in these patients were determined through 2-3 month after the antibacterial therapy, **in 56% of patients showed increase of titer, and 33% of patients the titer of antibody was the same and only 11% of patients the titer of antibody was below diagnostic.**
- **All patients after antibacterial therapy were transferred for observation to the dispensary. Subsequently they have not been identified in the activity of infectious process.**

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