PECULIARITIES OF LABORATORY DIAGNOSTICS OF INTRAUTERINE INFECTION

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In the case of suspected IUI, the most common infections tested for are toxoplasmosis, CMVI, herpes infection, chlamydia and, more recently, infectious mononucleosis. Examination of the mother during pregnancy in most cases makes it possible to exclude those infections for which negative results have been obtained, and to conduct targeted examination of the child. If the mother is not examined, it is recommended to perform a parallel blood test on the mother and the child for a prompt and more reliable diagnosis of IUI. In this case, there may be different situations that cause difficulties for doctors in interpreting the results. It is in the diagnosis of neonatal pathology the greatest diagnostic value have additional tests (detection of low-avidity antibodies, IgA, antigens or DNA pathogen) [1,2,3].

Keywords: low-avidity antibodies, IgA, antigens, maternal antibodies, false-negative result;

Detection of IgG alone is uninformative due to the circulation of maternal antibodies received by the child transplacentally ("immune contribution of the pregnant woman"). To exclude the infection of children (primarily those born from infected mothers), it is recommended to examine the child in dynamics at 1 month, 3 months and 6 months of age, as well as at the appearance of signs of neonatal pathology (determination of the serologic profile and antigens of the pathogen, evaluation of clinical data, comparison of the results of general clinical and functional examination). It should be remembered that when examining newborns for the presence of intrauterine infections, a false-negative result of serologic testing may be obtained due to the influence of high concentrations of maternal IgG antibodies (masking the presence of IgM in the child) or immunologic tolerance [4,5,6].

Therefore, in case of suspected IUI, it is preferable to use direct diagnostic methods aimed at detection of pathogen antigens (RIF) and its nucleic acid (PCR) in blood or cerebrospinal fluid (provided spinal puncture is performed for medical reasons). Immunologic tolerance is understood as the inability of the organism to

mount an immune response to a certain antigen. The time of its formation varies from several hours to several days, and its duration depends on the persistence of antigen in the body and the rate of formation of immunocompetent cells from their precursors. Induction of tolerance is promoted by nonspecific immunosuppression (including under the influence of drugs). Tolerance may occur in the presence of antigen overload; it is not permanent, its duration may be increased by periodic exposure to antigen. Exit from the state of tolerance can be spontaneous or induced [7,8,9,10].

Detection of specific IgM and/or IgA antibodies in infants unambiguously indicates that the child is infected (IgM and IgA are not transmitted through the placenta and are own antibodies produced in the presence of pathogen antigens). Our data indicate the difficulty of diagnosing congenital opportunistic infections and the rare detection of IgM in newborns and infants. If neurologic symptoms predominate, the level of specific IgG antibodies in serum may not be determined or may be low. In this case, examination of cerebrospinal fluid for specific antibodies or antigens of the pathogen is of greatest diagnostic value [11,12,13,14,15,16].

The reasons for a false negative serologic study may be:

1) immunologic tolerance (more frequent);

2) the influence of high concentrations of maternal IgG class antibodies (masking the presence of IgM and the child's own IgG), and in seronegative children with congenital infection IgM, IgA and IgG may appear at a later age (at 6-8 months).

3) increased antigenic stimulation of the immune system, which occurs with co-infection, especially in the case of active viral infection (cytomegalovirus or herpes) [17,18,19].

The most severe consequences for the fetus and newborn arise in case of combined infection with toxoplasmas and cytomegalovirus (CMV) or herpes virus, and such combinations are not uncommon (it is possible to detect both intracellular organisms in the stillborn in alveolar and intraalveolar macrophages: inclusions of toxoplasmas were found in the cytoplasm, and cytomegalovirus - in the nuclei of cells).

Detection of specific IgA antibodies (in toxoplasmosis, neonatal herpes, chlamydia), detection of low-avidity IgG antibodies (in toxoplasmosis, CMVI, herpes infection) or detection of antibodies to early pathogen proteins by immunoblot (for syphilis, herpes, CMVI, and Epstein-Barr virus (EBV) infections). In brain lesions it is recommended to use special test-systems (produced by “EUROIMMUN” company), designed to detect IgG antibodies in cerebrospinal fluid (with parallel examination of blood serum) in suspected toxoplasmosis, CMVI, herpes and VEB-infection.

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