

DIAGNOSIS AND PREVENTION OF TORCH INFECTION IN PREGNANT WOMEN

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Abstract

Intrauterine infections (IUI) are a group of infectious and inflammatory diseases of the fetus and young children that are caused by various pathogens, but are characterized by similar epidemiological parameters and often have the same type of clinical manifestations. Congenital infections develop as a result of intrauterine (anteuterine/or intranatal) infection of the fetus. IUIs are serious diseases and largely determine the infant mortality rate. The relevance of the problem of congenital infections is due not only to significant peri- and postnatal losses, but also to the fact that children who have suffered severe forms of congenital infection very often develop serious health problems, often leading to disability and a decrease in the quality of life in general. Taking into account the widespread prevalence and seriousness of the prognosis, it can be concluded that the development of highly accurate methods of early diagnosis, effective treatment and effective prevention of congenital infections is one of the priority tasks of modern pediatrics.

Keywords: Intrauterine infection (IUI), TORCH infection, diagnostics, IgM, IgG, ELISA, PCR, prevention.

Introduction

Primary infection - the mother's body is infected with the pathogen for the first time during pregnancy a secondary infection occurs as a result of the activation of a pathogen that was previously in the mother's body in a latent state (reactivation) or due to repeated infection (reinfection) [9,10]. Most often, infection of the fetus and the development of severe forms of IUI are observed when a woman suffers a primary infection. Penetration of the pathogen into the fetus's body during embryogenesis often leads to fetal death, spontaneous miscarriages and the development of severe developmental defects incompatible with life. The source of infection for the fetus is the mother. Intrauterine infection is typical for viruses: CMV, rubella, Coxsackie, toxoplasma, mycoplasma, while vertical transmission of infection can be carried out by transovarial, transplacental and ascending routes [5,8].

TORCH syndrome or TORCH infections is a general name used to refer to a group of intrauterine infections (IUI). T- toxoplasmosis, O- other infections, R- rubella, C- cytomegalia, H- infections caused by the herpes simplex virus. All TORCH infections can affect people of any age and



gender, but the term itself is used only in relation to pregnant women. During pregnancy, primary infection with an infection from the TORCH group is dangerous [6,7].

The peculiarity of TORCH infections is that when a woman is infected with them during pregnancy, they can have a detrimental effect on all systems and organs of the fetus, especially on its central nervous system, increasing the risk of miscarriage, stillbirth and congenital malformations of the child. Perinatal infections account for approximately 2-3% of all congenital fetal anomalies. Often, infection of a pregnant woman with TORCH complex infections is a direct indication for termination of pregnancy [1,4].

Clinical manifestations of TORCH syndrome depend not only on the etiology, but also on the timing of pregnancy when the infection occurred. Manifest forms of intrauterine infections in newborns have similar clinical manifestations. Children are born prematurely or with signs of intrauterine growth retardation and hepatosplenomegaly. Also, children with IUI experience jaundice, exanthema, respiratory and various neurological disorders, hemorrhagic syndromes, and anemia. In this pathology, it is important to establish a diagnosis as early as possible, given that it is currently possible to use etiotropic drugs for a number of IUIs (acyclovir for congenital herpes, benzylpenicillin for congenital syphilis and B streptococcal infection, ampicillin for congenital listeriosis, macrolides for intrauterine mycoplasmosis, chlamydia and ureaplasmosis, pyrimethamine with sulfonamides or spiramycin for congenital toxoplasmosis) [2,3].

TORCH infections are diagnosed by testing blood for the presence of IgM and IgG antibodies to the pathogens of toxoplasmosis, rubella, cytomegalovirus and herpes. Laboratory determination of the etiology of TORCH syndrome is a key link in diagnosis. At the same time, the uniformity of clinical manifestations of IUI justifies the need for immediate laboratory determination of the etiology of the disease. For the etiological verification of congenital infections, two main groups of methods are used, conventionally designated as "direct" and "indirect". "Direct" laboratory tests include methods aimed at detecting the pathogen itself (classical microbiological, virological), its DNA or RNA (molecular biological) or antigens (immunochemical). "Indirect" tests are methods that allow the detection of specific antibodies to pathogen antigens in the blood serum. In recent years, enzyme-linked immunosorbent assay (ELISA) has been most frequently used for this purpose [10]. The "gold standard" of diagnostics is considered to be a combination of "direct" and "indirect" diagnostic methods. In this case, the most frequently used "direct" method is PCR (specificity and sensitivity - more than 90%), and the most frequently used "indirect" method is ELISA (specificity and sensitivity - more than 75%). When using PCR, it is better to use modern methods for quantitative determination of DNA or RNA of infectious agents, testing several biological environments (blood, cerebrospinal fluid, urine, nasopharyngeal swabs, endotracheal aspirates). This approach increases the clinical information content of the studies conducted, allows us to assess the dynamics of the development of the infectious process and the effectiveness of etiotropic therapy [6,9]. IFA should be performed before the introduction of plasma and immunoglobulins. The diagnostic value of IFA is significantly increased if the newborn is examined simultaneously with the mother, with mandatory determination of the avidity index of specific IgG. The use of "paired sera" to determine the increase in antibody concentration over time is only possible in cases where the newborn has not received blood products (plasma, immunoglobulins, etc.). The criteria for verifying the etiology of IUI is the detection of specific IgM and/or genome (DNA, RNA) of the pathogen in a newborn child.



An indirect laboratory sign of IUI of a certain etiology is the detection of specific IgG with a low avidity index in the absence of specific IgM. The diagnostic value of low-avidity specific IgG is significantly increased if, during a parallel serological examination of the mother, high-avidity specific IgG is detected in her.

Thus, at present there are highly sensitive and highly specific methods of laboratory diagnostics that allow for rapid and highly reliable verification of the etiology of the disease, which determines the possibility of early initiation of etiotropic therapy to improve the prognosis of IUI. It is recommended to test for TORCH infections before conception or in the first trimester of pregnancy. Based on the results obtained, adhere to the tactics of its management agreed upon with the gynecologist. To prevent rubella, get vaccinated against rubella (after vaccination, you can plan a pregnancy no earlier than 3 months later) [2,8]. To prevent infection with toxoplasmosis, avoid contact with cats (young individuals are especially dangerous) and cleaning the cat's litter box, avoid working with soil, or work only with gloves; wash all vegetables, fruits, and greens thoroughly before eating, avoid contact with raw meat, and thoroughly boil or fry all meat dishes. There is no specific prophylaxis against cytomegalovirus and herpes simplex virus, so women who do not have protective antibodies remain at risk of contracting these infections. It is also necessary to examine the child's father for the presence of antibodies to cytomegalovirus and herpes simplex virus type 2 in order to exclude the source of infection [3,7].

Conclusion

It can be assumed that modern methods of diagnostics and prevention of TORCH infection in pregnant women allow to avoid severe complications and improve the prognosis of pregnancy.

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