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The Role of Phlogogenic Factors in the Development of Herpetic Stomatitis in Children with Congenital Cytomegalovirus Infection

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Annotation: With congenital CMI, transmission of the virus to the fetus occurs transplacentally, with perinatal infection — through contact with the mother's vaginal secretions, breast milk or blood preparations. The risk of infection increases if a mother with an acute form of the disease does not receive specific treatment. In the postnatal period, a child is most often infected from close relatives and peers by airborne droplets or household contact.

Keywords: Cytomegalovirus, herpetic stomatitis, periodontitis tissue, immunological, dental, clinical and functional, laboratory, statistical method.

Cytomegalovirus infection in children is an infectious disease caused by cytomegalovirus and affects the salivary glands, internal organs, and central nervous system. In childhood, pathology occurs more often with transplacental or intranatal infection. Localized forms are manifested by sialadenitis, hepatitis, nephritis, etc., a common variant of infection is characterized by damage to the brain, lungs, kidneys and gastrointestinal organs. Diagnosis involves the identification of the pathogen by cytological, histological, serological and molecular biological methods. Cytomegalovirus disease is treated with specific immunoglobulin and antiviral drugs.

Infection with cytomegalovirus infection (CMVI) is observed in 20%-60% of the total child population, but in most cases it is asymptomatic. Intrauterine infection with the virus from a sick mother occurs in 30-50% of cases, while up to 18% of infants have clinical symptoms after birth. Given the polymorphism of the clinical picture, early diagnosis and treatment in children are difficult. Cytomegalovirus infection is a serious danger, especially for the fetus and newborn, in whom the disease usually causes irreversible complications.

The disease is caused by herpesvirus type 5 — Cytomegalovirus hominis. It has 6 strains: Davis, AD 169, Kerr, C87, Esp, Towne, and a child can be infected with several subtypes of the pathogen at once. Cytomegalovirus (CMV) has a DNA genome, is characterized by slow replication and relatively low virulence. It is thermolabile, destroyed at temperatures above 56 ° C, but remains viable for a long time in room conditions.

With congenital CMI, transmission of the virus to the fetus occurs transplacentally, with perinatal infection — through contact with the mother's vaginal secretions, breast milk or blood preparations. The risk of infection increases if a mother with an acute form of the disease does not receive specific treatment. In the postnatal period, a child is most often infected from close relatives and peers by airborne droplets or household contact.

Once in the blood, the virus replicates in leukocytes, monocytes and macrophages and later it persists for life in lymphocytic organs. Often, the process is expressed in the form of a latent infection, in which the child has no symptoms and does not require treatment. The activity of cytomegalovirus depends on the state of immunity: with physiological immune deficiency, which is observed in young children, the risk of manifest cytomegalovirus infection increases significantly.

- When the body's protective factors (interleukin system, T-lymphocytes) are suppressed, the pathogen spreads with blood to different organs. The cells of the salivary glands are most sensitive to it, where specific pathomorphological changes often occur. The disease is characterized by the formation of large cytomegalovirus cells ("owl's eye"). In addition, fibrosis of glandular organs and calcification deposition are possible with CMVI. In pediatric infectology, there are congenital (intrauterine) and acquired forms of pathology. The infection can be acute (up to 3 months), subacute (3-6 months), prolonged (6-12 months) and chronic (more than 1 year). According to clinical signs, localized (sialadenitis, nephritis, hepatitis, encephalitis) and generalized variants are distinguished. Taking into account the severity of the course, cytomegalovirus disease is divided into 3 degrees:
- Easy. It differs in minor pathomorphological changes in internal organs, which do not affect their functional activity.
- Medium-heavy. It is manifested by pronounced organic lesions in combination with clinical symptoms and dysfunction of some internal organs.
- Heavy. It manifests severe organic pathologies, pronounced intoxication and generalized nature of the lesion.

In patients with a manifest congenital form of cytomegalovirus disease, signs are observed from the first days of life. A typical set of symptoms in newborns includes prematurity and/or low body weight, damage to the hepatobiliary system (enlarged liver, jaundice, hepatitis and cirrhosis), lymphadenopathy and hemorrhagic skin rash. If the infection occurred in the early stages of pregnancy, the child is born with abnormalities — microcephaly, hypoplasia of the lungs, atresia of the esophagus. Acquired CMVI

Acquired cytomegalovirus disease usually occurs in a subclinical or latent form, when a child has flu-like symptoms, subfebrile fever for no apparent reason. After infection, the infection may not manifest itself for a long time and give exacerbations with a decrease in the immune status, the action of unfavorable endogenous or exogenous factors.

The course of the manifest acquired form resembles infectious mononucleosis. The child suddenly becomes weak, fever rises, malaise, headaches, and lack of appetite. Later, severe pain in the throat joins, the submandibular and cervical lymph nodes increase. If cytomegalovirus infection is manifested by sialadenitis, there is a sharp increase and soreness of the salivary glands against the background of febrile fever. Generalized CMVI

In the generalized course of infection in children, the bronchopulmonary system (pneumonia, respiratory failure), gastrointestinal tract (enterocolitis, malabsorption), liver (jaundice, cytomegalovirus hepatitis, biliary cirrhosis) are affected. It is especially dangerous to involve the nervous system in the process, which is manifested by convulsive syndrome, paresis and paralysis, and delayed psychomotor development.

Negative consequences are detected mainly in children suffering from congenital cytomegalovirus infection. In 58% of cases, neurological disorders (paresis, somatosensory insufficiency) remain after a severe form of the disease, 28% of children are mentally retarded. CMVI is characterized by hearing loss up to deafness (25% of cases) and irreversible vision loss (8-15%). Cell damage in cytomegalovirus disease creates favorable conditions for the occurrence of autoimmune lesions — systemic lupus erythematosus, multiple sclerosis, glomerulonephritis. Sometimes, after a low-symptomatic congenital cytomegalovirus infection, complications are observed in the long-term period (at the age of a child 2-5 years old). They are mainly manifested by neurological disorders and damage to the senses.

- Cytomegalovirus infection is characterized by a variety of clinical signs and often occurs under the guise of other pathologies, which complicates the work of a pediatric infectious disease specialist. At the initial appointment, in addition to the standard physical examination, the doctor collects a

detailed obstetric history to identify risk factors for antenatal infection. The diagnosis of CMVI is valid only with laboratory confirmation, for which the following methods are used:

- Cytological analyses. Urine, saliva, sputum and other biological fluids are taken for examination. When analyzing specially colored preparations under a microscope, the doctor identifies cytomegals, which are a pathognomonic sign of cytomegalovirus infection. The method has insufficient sensitivity, so it is repeated repeatedly for 3-5 days.
- Histological studies. The "gold standard" for diagnosing congenital infection in children involves examining placenta samples. Focal ischemic infarcts, necrosis of the basal lamina, and signs of productively proliferative villusitis are considered important criteria. Usually, the analysis reveals typical cells of the "owl's eye" type.
- Molecular biological methods. It is informative to conduct PCR diagnostics to detect the genetic material of the virus in biological material (saliva, urine, cerebrospinal fluid). The method gives the doctor the opportunity to monitor the level of viral load in order to adjust antiviral treatment and evaluate its effectiveness. • Serological reactions. ELISA is required to detect IgM and low-level IgG, which is typical for the acute phase of the infectious process. As the immune system recovers and develops, G immunoglobulins with high avidity appear in the blood. RIF is used to detect antigens in cell cultures or peripheral blood cells.

In cytomegalovirus, the epidemic process is characterized by the absence of a well-defined periodicity, seasonality, and cyclicity. The frequency of asymptomatic forms and the impossibility of differential diagnosis only by the clinical manifestations of the manifested forms have led to the fact that the data of the official census of the incidence of cytomegalovirus infections do not reflect their actual distribution among the population, make it difficult to timely make adequate management decisions, carry out preventive and antiepidemic measures.

The reliability of the research results is confirmed by the use of modern, complementary dental, clinical and functional, laboratory, immunological and statistical methods used in research work, obtaining a sufficient number of children diagnosed with herpetic stomatitis with the detection of cytomegalovirus, theoretical and practical confirmation of the presented results, their reliability in comparison with the data obtained by domestic and foreign by researchers, the validity of the presented conclusions., and also on the basis of approval by authorized organizations.

Practical results of the study: The most frequent localization of herpetic stomatitis in cytomegalovirus infection on the oral mucosa is included in the topogram scheme in ascending order of prevalence: sublingual, convex, retromolar region, gum, tongue, hard palate, soft palate, lip; the cytomegalovirus trigger factor in the pathogenesis of herpetic stomatitis is based on; Children with herpetic stomatitis who have cytomegalovirus infection cytokines IL-4 and IL-8 in blood serum, determination of IgE indicators has been proven to increase the effectiveness of early diagnosis in children in dental practice; the complex use of stomasphere in early diagnosis and complex treatment of herpetic stomatitis against the background of cytomegalovirus in dental practice has shown low effectiveness of the traditional method treatment.

Instrumental methods are selected according to the form of the disease. To assess the structural and functional features of the liver and biliary tract, ultrasound of the abdominal organs is prescribed. CT and MRI scans of the brain are informative for detecting birth defects and calcifications. Radiography of the OGC is necessary for symptoms of respiratory disorders. According to the indications, the child is referred for consultations to specialized specialists — a cardiologist, a neurologist, an otolaryngologist. The drug of choice in newborns and children of the first year of life is a specific anticytomegalovirus immunoglobulin, which has an increased concentration of IgG.

Treatment begins with manifest forms of the disease and is carried out according to the scheme: first, a high dose of the drug is administered, and after 9-10 days the dosage is gradually reduced, controlling the degree of response to therapy and the activity of the process. At an older age, the list of drugs used for cytomegalovirus infection is significantly expanded. Treatment includes antiviral agents from the

group of nucleosides and nucleotides (ganciclovir, valganciclovir), derivatives of orthophosphoric acid (foscarnet). In mild and moderate forms, interferons and immunostimulants are prescribed.

Copious drinking is indicated for the relief of intoxication (in mild forms), infusion therapy is recommended for moderate and severe clinical variants. Pathogenetic therapy is selected in accordance with the nature of the course of the disease and may include digestive enzymes, proteinase inhibitors, and hemostatics. Antibiotics (macrolides, cephalosporins, glycopeptides) are used to prevent secondary bacterial complications. With low-symptomatic acquired variants, cytomegalovirus disease proceeds without complications, often only latent carrier is detected in the child. Severe generalized infections pose a threat to life and health, which in 50-60% of cases are accompanied by complications, despite the ongoing treatment. Cytomegalovirus infection is especially dangerous for children with immunodeficiency conditions.

The basis for the prevention of congenital CMVI is the mandatory laboratory examination of women for cytomegalovirus carriers, which is carried out during conception planning and during pregnancy. If there is a patient with cytomegalovirus infection in the family, it is necessary to limit his communication with the child and provide treatment. Quarantine and isolation measures are not carried out in relation to patients and contact persons.

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