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# Clinical and Laboratory Features of Intrauterine Infection

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***Abstract:*** Intrauterine infections are a group of diseases that develop as a result of infection of the fetus and newborn in the prenatal period or during childbirth. Intrauterine infections can cause fetal death, spontaneous abortion, intrauterine growth retardation, premature birth, birth defects, and damage to internal organs and the central nervous system. Diagnostic methods of intrauterine infections include microscopic, cultural, immunoenzyme and molecular biological studies. Treatment of intrauterine infections is carried out with the help of immunoglobulins, immunomodulators, antiviral and antibacterial drugs.

***Keywords:*** Causes of intrauterine infections, symptoms of intrauterine infections Congenital toxoplasmosis, Congenital rubella, Congenital cytomegaly, Congenital herpetic infection.

Intrauterine infections are pathological processes and diseases caused by antenatal and intrapartum infection of the fetus. The true prevalence of intrauterine infections is not known, but according to general information, at least 10% of newborns are born with congenital infections. Urgency of the problem of intrauterine infections in pediatrics leads to high reproductive losses, early neonatal diseases, disability and postnatal death of children. Prevention of intrauterine infections lies in the field of obstetrics and gynecology, neonatology and pediatrics.

**Causes of intrauterine infections**

Intrauterine infections develop as a result of infection of the fetus in the prenatal period or directly during birth. Usually, the mother is the source of intrauterine infection for the child, that is, in the antenatal period, there is a mechanism of vertical transmission, which is carried out by transplacental or elevated (through infected amniotic fluid) routes, and in the intranatal period, by aspiration or intranatal route. ways of communication.

Iatrogenic infection of the fetus is less common during pregnancy during invasive prenatal diagnostics (amniocentesis, cordocentesis, chorionic villus biopsy), blood products are administered to the fetus through umbilical vessels (plasma, red blood cells, immunoglobulins). ) and others.

Infection of the fetus in the antenatal period is usually associated with viral agents (rubella viruses, herpes, cytomegalovirus, hepatitis B and C, Coxsackie, HIV) and intracellular pathogens (toxoplasmosis, mycoplasmosis).

In the intranatal period, microbial contamination occurs more often, the nature and extent of which depends on the microbial landscape of the mother's birth canal. Among bacterial agents, the most common are enterobacteria, group B streptococci, gonococci, Pseudomonas aeruginosa, Proteus, Klebsiella, and others. The placental barrier is impenetrable to most bacteria and protozoa, but if the placenta is damaged and fetoplacental diseases develop. microbial infection may occur (for example, with the causative agent of syphilis). In addition, intrapartum viral infection cannot be excluded.

Factors of occurrence of intrauterine infections - severe obstetric and gynecological history of the mother (non-specific colpitis, endocervicitis, STD, salpingophoritis), unfavorable course of pregnancy (risk of pregnancy, gestosis, early placental abruption of a pregnant woman). . The risk

of developing a manifest form of intrauterine infection is significantly higher in premature babies and in cases where a woman is first infected during pregnancy.

The severity of clinical manifestations of intrauterine infection is influenced by the time of infection and the type of pathogen. Thus, if the infection occurs during the first 8-10 weeks of embryogenesis, pregnancy usually ends in spontaneous abortion. Intrauterine infections occurring in the early fetal period (before 12 weeks of pregnancy) can lead to stillbirth or the formation of gross malformations. Intrauterine infection of the fetus in the second and third trimester of pregnancy is manifested by damage to individual organs (myocarditis, hepatitis, meningitis, meningoencephalitis) or general infection.

It is known that the severity of the manifestations of the infectious process in a pregnant woman and the fetus may not match. An asymptomatic or minimally symptomatic course of infection in the mother can cause serious harm to the fetus, including its death. This is due to the increased tropism of viral and microbial pathogens to embryonic tissues, mainly the central nervous system, the heart, and the organ of vision.

**Classification**

The etiological structure of intrauterine infections shows their division into:

viral (viral hepatitis, herpes, rubella, ARVI, cytomegaly, mumps, enterovirus infection)

bacterial (tuberculosis, syphilis, listeriosis, sepsis)

parasitic and fungal (mycoplasmosis, toxoplasmosis, chlamydia, candidiasis, etc.)

To designate the most common group of intrauterine infections, the abbreviation TORCH syndrome, which combines toxoplasmosis, rubella, cytomegalovirus and herpes simplex, is used. The letter O (other) refers to other infections, including viral hepatitis, HIV infection, chicken pox, listeriosis, mycoplasmosis, syphilis, chlamydia, and others.

**Symptoms of intrauterine infections**

The presence of intrauterine infection in a newborn can already be suspected during childbirth. Intrauterine infection can be indicated by the discharge of cloudy amniotic fluid, contaminated with meconium and with an unpleasant odor, and the condition of the placenta (plethora, microthrombosis, micronecrosis). Children with intrauterine infection are often born in a state of asphyxia, prenatal malnutrition, liver enlargement, malformations or stigmas of dysembryogenesis, microcephaly, hydrocephaly. From the first days of life, jaundice, elements of pyoderma, pink or vesicular rashes on the skin, fever, convulsions, respiratory and cardiovascular diseases are observed.

With intrauterine infections, the early neonatal period is often aggravated by interstitial pneumonia, omphalitis, myocarditis or carditis, anemia, keratoconjunctivitis, chorioretinitis, hemorrhagic syndrome, etc. Congenital cataract, congenital brain defect, congenital heart defect, glaucoma, etc. may be present during instrumental examination. is determined in newborns.

In the perinatal period, the child experiences frequent and abundant regurgitation, muscle hypotension, central nervous system depression syndrome, and gray skin color. In later stages, late meningitis, encephalitis and osteomyelitis may develop with a long incubation period of intrauterine infection.

**Congenital toxoplasmosis**

Intrauterine infection with a single-celled protozoan parasite Toxoplasma Gondii causes serious damage to the fetus - developmental delay, congenital defects of the brain, eyes, heart and skeleton.

In the acute period after birth, intrauterine infection is manifested as fever, jaundice, swelling syndrome, exanthema, bleeding, diarrhea, convulsions, hepatosplenomegaly, myocarditis, nephritis, pneumonia. Symptoms of meningitis or encephalitis predominate in the subacute course.

Microcephaly, iridocyclitis, strabismus and hydrocephalus with optic nerve atrophy develop with chronic duration. Sometimes monosymptomatic and latent forms of intrauterine infection appear.

**Congenital rubella**

Intrauterine infection occurs due to rubella during pregnancy. The probability and consequences of fetal infection depend on the period of pregnancy: in the first 8 weeks, the risk reaches 80%; Consequences of intrauterine infection can include spontaneous abortion, embryo and fetopathy. The risk of intrauterine infection in the second trimester is 10-20%, in the third - 3-8%.

Classic manifestations of congenital erysipelas are represented by Greg's triad: eye damage (microphthalmia, cataract, glaucoma, chorioretinitis), congenital heart disease (patent arteriosus, ASD, VSD, pulmonary stenosis), auditory nerve damage (sensorineural deafness). If an intrauterine infection develops in the second half of pregnancy, the child usually has retinopathy and deafness.

In addition to the main manifestations of congenital rubella, other anomalies can be detected in the child: microcephaly, hydrocephalus, cleft palate, hepatitis, hepatosplenomegaly, malformation of the genitourinary system and skeleton. In the future, intrauterine infection will remind the delay in the child's physical development, mental retardation, or mental retardation.

**Congenital cytomegaly**

Intrauterine infection with cytomegalovirus infection can cause local or general damage to many organs, immunodeficiency and purulent-septic complications. Congenital developmental defects commonly include microcephaly, microgyria, microphthalmia, retinopathy, cataracts, congenital heart disease, and more. The neonatal period of congenital cytomegaly is complicated by jaundice, hemorrhagic syndrome, bilateral pneumonia, interstitial anemia, etc.

Long-term consequences of intrauterine infection include blindness, sensorineural deafness, encephalopathy, liver cirrhosis, and pneumosclerosis.

**Congenital herpetic infection**

Intrauterine herpes infection can be general (50%), neurological (20%), mucosal (20%).

Common intrauterine congenital herpetic infection is accompanied by severe toxicosis, respiratory distress syndrome, hepatomegaly, jaundice, pneumonia, thrombocytopenia, hemorrhagic syndrome. The neurological form of congenital herpes is clinically manifested by encephalitis and meningoencephalitis. With the development of skin syndrome, intrauterine herpes infection is accompanied by the appearance of a vesicular rash on the skin and mucous membranes, including internal organs. When a bacterial infection occurs, neonatal sepsis develops.

Intrauterine herpes infection in a child can cause developmental defects - microcephaly, retinopathy, limb hypoplasia (cortical dwarfism). Late complications of congenital herpes include encephalopathy, deafness, blindness, and psychomotor retardation.

**Diagnostics**

Currently, prenatal diagnosis of intrauterine infections is an urgent task. For this purpose, in the early stages of pregnancy, smear microscopy, bacteriological culture of the vagina for flora, PCR examination of scrapings, examination for the TORCH complex are carried out. Invasive prenatal diagnosis (chorionic villus aspiration, amniocentesis with amniotic fluid examination, cordocentesis with umbilical cord blood examination) is indicated for pregnant women at high risk of intrauterine infection.

Echographic signs of intrauterine infections can be determined using obstetric ultrasound. Indirect echographic signs of intrauterine infection include oligohydramnios or polyhydramnios; presence of hyperechoic suspension in amniotic fluid or amniotic cords; hypoplasia of chorionic villi, placenta; premature aging of the placenta; fetal swelling syndrome (ascites, pericarditis, pleurisy), hepatosplenomegaly, calcification and malformation of internal organs, etc. In the process of

Doppler examination of blood flow, fetal-placental blood flow disorders are detected. Cardiotocography reveals signs of fetal hypoxia.

After the birth of the child, microbiological (virological, bacteriological), molecular biological (DNA hybridization, PCR), serological (ELISA) testing methods are used to reliably check the etiology of intrauterine infection. Histological examination of the placenta has important diagnostic value.

According to the indications, on the first day of life, newborns with intrauterine infections should be examined by a pediatric neurologist, a pediatric cardiologist, a pediatric ophthalmologist, and other specialists. It is recommended to carry out echocardiography, neurosonography, ophthalmoscopy and hearing tests using the method of stimulated otoacoustic emission.

**Treatment of intrauterine infections**

General principles of treatment of intrauterine infections include immunotherapy, antiviral, antibacterial and syndromic therapy.

Immunotherapy includes the use of polyvalent and specific immunoglobulins, immunomodulators (interferons). Targeted antiviral therapy is mainly carried out with acyclovir. For antimicrobial treatment of bacterial intrauterine infections, broad-spectrum antibiotics (cephalosporins, aminoglycosides, carbapenems) are used for mycoplasma and chlamydia infections, macrolides;

Syndromic therapy of intrauterine infections is aimed at eliminating individual manifestations of damage to the perinatal central nervous system, hemorrhagic syndrome, hepatitis, myocarditis, pneumonia, etc.

**Prognosis and prevention**

With common forms of intrauterine infections, mortality in the neonatal period reaches 80%. Internal organs are seriously damaged in local forms (cardiomyopathies, COPD, interstitial nephritis, chronic hepatitis, cirrhosis, etc.). In almost all cases, intrauterine infections cause damage to the central nervous system.

Prevention of intrauterine infections consists of preparation before conception, treatment of STD before pregnancy, exclusion of contacts of pregnant women with infectious patients, correction of pregnancy management program for women at risk. Women with no previous history of rubella and who have not been vaccinated against rubella should be vaccinated 3 months before expected pregnancy. In some cases, intrauterine infections can be a reason for artificial termination of pregnancy.

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