

# Viral Infections in Pregnancy

## Effects of Maternal Viral Infections

There are several viruses that if contracted during pregnancy can cause serious side effects. It is important to understand these infections and be able to identify them.

## TORCH Infections

There are a group of infectious diseases that may cause serious harm to the unborn baby called TORCH. This stands for: (TO) toxoplasmosis, (R) rubella, (C) cytomegalovirus, (H) herpes virus type 2. Toxoplasmosis is a protozoal infection. The other three are viral infections.

## Toxoplasmosis

Toxoplasmosis is caused by the protozoan *Toxoplasma gondii*. It is harmless to adults but if the mother contracts it during pregnancy it can be devastating to the unborn baby. The pregnant woman may contract the organism by eating poorly cooked meat, or by contact with cat feces.

Toxoplasmosis increases the risk of miscarriage, prematurity, stillbirth, neonatal death, and severe congenital anomalies. If it is acquired before 20 weeks of pregnancy damage to the baby is more severe. If the infection is very mild, retinochoroiditis may be the only sign of the disease. Severe infection is associated with convulsions, coma, microencephaly, and hydrocephaly. These babies may die soon after birth. Survivors are often blind, deaf, and severely retarded.

Treatment consists of identifying the woman at risk, diagnosing and treating the disease promptly. Diagnosis is made by serologic testing. Elevated titers peak one month after infection are usually present for four to eight months, but they may be present for up to a year. The woman may be treated with sulfadiazine, pyrimethamine, and spiramycin. Pregnant women should avoid contact with litter boxes and avoid gardening in areas where cats have defecated. They should wear gloves while gardening. They should not eat raw or poorly cooked meat. Fruits and vegetables should be washed before eating.

## Rubella (German Measles)

The effects of rubella on the pregnant mother are the same as they would be at any other time in her life. The symptoms of rubella may be mild or absent in an adult. She may have a mild infection with a maculopapular rash, swollen lymph nodes, achiness, and joint pain. A blood test will reveal the presence of IgM antirubella antibodies.

The complications that are of major concern are to the unborn baby. The greatest risk for teratogenic effects caused by rubella is during the first trimester. If infection occurs during the first 4 weeks of pregnancy, 50% of unborn babies will have serious effects or die. During the 2nd month of pregnancy 25% will be affected. During the 3rd month, 15% will be affected. During the early part of the second trimester serious hearing impairment will usually occur.

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Clinical signs of infection are congenital heart disease, IUGR, and cataracts. The heart disease may involve a patent ductus arteriosus and narrowing of peripheral pulmonary arteries. Cataracts may be unilateral or bilateral and may be present at birth or develop after birth. A petechial rash may be seen. Hepatosplenomegaly and hyperbilirubinemia are frequently seen. Mental retardation or cerebral palsy may become evident during infancy. Diagnosis is made by the presence of these conditions and an elevated rubella IgM antibody titer at birth. These infants are infectious at birth and may continue to be so for months.

Women are routinely tested for immunity to rubella. A presence of a 1:16 titer or greater is evidence of immunity. A titer of less than 1:8 indicates non-immunity and susceptibility to rubella.

Some health practitioners are now advising immunization during pregnancy if the blood tests show she is not immune. This is becoming the new standard of care in our country.

However, risk and benefits must be weighed before a mother can make this decision. She must decide how high her risk is of contracting rubella is based on if she has other children who may infect her, if her other children are immunized, how often she is in contact with children outside of her own home, etc. If she feels her risk is high she may want to consider being immunized. If her risk of contracting rubella is low, she may feel the risks of immunization during pregnancy is not worth the chance.

### **Cytomegalovirus (CMV)**

Cytomegalovirus belongs to the herpes virus group. It causes cytomegalic inclusion disease (CID). Nearly half of all adults have antibodies to CMV. It is a very prevalent infection. It can be found in urine, saliva, cervical mucus, semen, and breast milk. It can be passed to another person by close contact such as kissing, breast-feeding, or sexual intercourse. Often there are no symptoms present. Diagnosis is made by blood and/or urine tests. There is no treatment for CMV.

CMV infects 0.5% to 2.0% of neonates and of these about 10% will develop serious manifestations. The worst cases of infections occur when the mother's initial outbreak of CMV is during pregnancy. CMV may produce mental retardation, auditory deficits, learning disabilities that may not be recognized until childhood, microcephaly, hydrocephaly, cerebral palsy, or death. The infant may be small for gestational age. The blood, brain, and/or liver may be affected. However, all organs are at risk. The infant may recover with no damage at all.

### **Herpes Simplex Virus Type 2 (Herpes Genitalis)**

Herpes Simplex virus type 2 (HSV-2) is a viral infection that causes painful lesions in the genital area. Lesions may develop on the cervix. The risk of complications is highest when the initial outbreak occurs near the time of birth. It is lower among women with recurrent herpes. Transmission of HSV-2 almost always occurs after the membranes rupture. It also occurs during vaginal birth. Transplacental infection is rare. If HSV-2 infection occurs during the first trimester 20% to 50% of women will miscarry. Infection after 20 weeks is associated with preterm labor.

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About 54% of babies born vaginally during an active stage of HSV-2 will develop some form of infection. If untreated about 70% will die and about 83% of those who survive will have brain damage. The infected infant is often asymptomatic at birth. The incubation period is 2-12 days. Symptoms include: fever, jaundice, seizures, poor feeding. 50% will have vesicular skin lesions. Vidarabine has been useful in decreasing serious effects, but no definitive treatment exists. Some doctors treat asymptomatic infants that were exposed during birth with acyclovir. Cultures are taken 24 and 48 hours after birth.

Treatment during pregnancy consists of relieving the woman's pain. Acyclovir may be prescribed. Sitz baths are recommended three to four times daily, followed by drying the vulva with a hair dryer or light bulb. Cotton underwear helps keep the genital area dry. During the initial visit, any history of HSV should be obtained. If the woman has no visible lesions at the time of labor, she may have a vaginal birth. For women with visible lesions, cesarean birth is indicated. If possible, cesarean birth should occur within 4 to 6 hours of rupture of membranes to decrease the risk of the infant becoming infected. Cultures every three to five days are indicated for women who have visible lesions at or near term but before the onset of labor.

### **Other Viruses**

#### **Chicken Pox (Varicella)**

Chicken pox is caused by the varicella zoster virus. After an attack there is a life long immunity. However, the virus remains dormant within nerve tissues after the attack and may cause herpes zoster later in life. Most people have the virus had a child. It is spread by airborne droplets. Patients are highly infectious from about two days before the rash appears or as soon as the fever begins, until all the sores have crusted over (about a week after eruption).

Pregnant women who have never had the virus should avoid it by staying away from any one with chicken pox or shingles. In the first trimester infection may result in birth defects or miscarriage. There is a 5% to 10% chance the baby will develop a pattern of defects of skin, bone, and muscle known as congenital varicella syndrome (CNS). CNS effects include chorioretinitis and hydrocephalus. Malformations and retardation may occur. During the second trimester effects on the unborn baby are less than during the other trimesters. After 20 weeks the incidence of malformations is much lower. During the last trimester if the baby is infected, it may be born with the virus. Maternal infection between 5 days before delivery to 2 days after may lead to neonatal varicella. 5% to 34% of these infants will die. The major concerns for the baby are respiratory. Many of these babies will have complications from varicella pneumonia.

Pneumonia is the most common maternal complications. The mortality in non-pregnant adults is about 10%. However in pregnancy, mortality rates with varicella pneumonia increase to 40%, probably because of changes in cell mediated immunity in pregnancy.

#### **Mumps (Parotitis)**

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This virus may cause miscarriage or preterm labor. Congenital malformation such as endocardial fibroelastosis may be associated with this virus.

### **Parvovirus B-19 (Fifth Disease or Erythema Infectiosum)**

Symptoms of this virus are fever and a characteristic "slapped face" rash. Maternal effects include headache, malaise, and aching swollen joints. Fetal effects include miscarriage, stillbirth, disruption of erythropoiesis leading to severe anemia, cardiac failure, nonimmune hydrops fetalis, and death. There is no treatment, however blood transfusions have limited success.

### **Rubeola (Measles)**

Most women are immune to this by the time they are an adult. However, if contracted during pregnancy, miscarriage or preterm labor may occur. The newborn may be born with the rash but usually survives without complications.

### **Influenza (Flu)**

There are many forms of this virus. Maternal effects can be serious if complicated by pneumonia. Miscarriage or preterm labor may occur.

### **Condyloma Acuminata (papovavirus)**

Genital warts are soft, grayish-pink lesions that may be found on the vulva, vagina, cervix, or anus. Treatment is usually Podophyllin, but large doses of this medication during pregnancy have been associated with fetal death. Trichloroacetic acid, liquid nitrogen, or cryotherapy laser therapy may also be used. The hormones of pregnancy may cause an increase of genital warts, and they will often go away after pregnancy.

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