



TORCH Infections during Pregnancy: Clinical Significance, Diagnosis, Prevention, and Management

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Abstract

TORCH infections are maternal infections that may cross the placenta or be transmitted to the newborn and cause miscarriage, fetal growth restriction, congenital abnormalities, neurological impairment, or neonatal disease. The acronym traditionally refers to Toxoplasmosis, Other infections, Rubella, Cytomegalovirus (CMV), and Herpes simplex virus (HSV). Maternal infection may be asymptomatic despite serious fetal consequences. Diagnosis should be based on clinical assessment, targeted laboratory testing, and, when indicated, fetal ultrasound and molecular testing. Prevention includes vaccination before pregnancy, food and hand hygiene, safer sexual practices, and appropriate prenatal screening. Early recognition and multidisciplinary management can reduce maternal, fetal, and neonatal complications

Keywords: TORCH infections, pregnancy, congenital infection, toxoplasmosis, rubella, cytomegalovirus, herpes simplex virus.

Introduction

TORCH infections are an important group of maternal and congenital infections that may cause miscarriage, stillbirth, fetal growth restriction, congenital malformations, neurological abnormalities, hearing or visual impairment, and neonatal infection. The acronym traditionally represents Toxoplasmosis, Other infections, Rubella, Cytomegalovirus, and Herpes simplex virus.

The presence of maternal infection does not necessarily mean that the fetus is infected or will develop complications. Fetal risk depends on the pathogen, gestational age at infection, maternal immunity, and availability of effective treatment or prevention. Therefore, diagnosis should be targeted according to clinical findings, exposure history, gestational age, and fetal assessment.

Toxoplasmosis

Toxoplasmosis is caused by *Toxoplasma gondii* and may be acquired through undercooked meat, contaminated food or water, soil, or cat feces. Maternal infection is often asymptomatic, but primary infection during pregnancy can cause congenital toxoplasmosis, including hydrocephalus, intracranial abnormalities, seizures, ocular disease, miscarriage, or stillbirth.



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Diagnosis generally includes IgG and IgM serology, confirmatory testing, and, when appropriate, IgG avidity testing. Amniotic-fluid PCR may be used when fetal infection is suspected. Treatment depends on gestational age and fetal infection status and may include spiramycin or, in selected cases, pyrimethamine, sulfadiazine, and folic acid. Prevention includes thorough cooking of meat, washing fruits and vegetables, hand hygiene, and avoiding cat feces.

Other Infections

The “Other” category may include syphilis, varicella-zoster virus, and parvovirus B19, HIV, and Zika virus.

Syphilis can cause miscarriage, stillbirth, fetal growth restriction, hydrops, prematurity, and congenital syphilis. Prenatal screening is essential, and penicillin G is the recommended treatment for preventing congenital infection

Primary varicella infection during pregnancy may cause maternal and fetal complications; vaccination before pregnancy is an important preventive strategy.

Parvovirus B19 can cause fetal anemia, hydrops fetalis, and fetal loss. When maternal infection is suspected, serial ultrasound and Doppler assessment of the fetal middle cerebral artery may be indicated.

Rubella

Rubella is usually mild in adults but can cause severe fetal complications, particularly when infection occurs during early pregnancy. Congenital rubella syndrome may include sensorineural hearing loss, cataracts, congenital heart disease, growth restriction, and developmental impairment. Rubella is vaccine-preventable. Women who are not immune should ideally receive MMR vaccination before pregnancy. Because MMR is a live attenuated vaccine, it is not routinely administered during pregnancy; susceptible women should generally be vaccinated postpartum

Cytomegalovirus

Cytomegalovirus is a major cause of congenital viral infection. Maternal infection is frequently asymptomatic, but fetal infection may result in microcephaly, intracranial abnormalities, growth restriction, hepatosplenomegaly, seizures, hearing loss, and developmental delay.

Evaluation may include maternal serology, IgG avidity testing, targeted ultrasound, and selected cases of amniotic-fluid PCR. Routine CMV serologic screening of all pregnant women is not generally recommended in the United States. Prevention focuses on careful hand hygiene and avoiding sharing food, drinks, or utensils with young children.



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Herpes Simplex Virus

HSV-1 and HSV-2 are important causes of neonatal infection, with most transmission occurring during labor and delivery. Neonatal herpes can involve the skin, eyes, central nervous system, or multiple organs.

Women with genital herpes should inform their healthcare provider. If genital lesions or prodromal symptoms are present at delivery, cesarean delivery is generally recommended. Suppressive therapy with acyclovir or valacyclovir from approximately 36 weeks may reduce recurrences and the need for cesarean delivery. Routine HSV serologic screening of asymptomatic pregnant women is not generally recommended.

Diagnosis and Prevention

Diagnosis should be targeted rather than based on indiscriminate TORCH testing. Depending on the suspected infection, evaluation may include maternal serology, PCR or other nucleic acid testing, syphilis testing, fetal ultrasound, Doppler studies, and amniotic-fluid PCR

Prevention includes: Preconception vaccination, particularly assessment of rubella immunity, Safe food preparation and avoidance of undercooked meat, Careful hand hygiene, especially after contact with young children or soil. Appropriate screening and safer sexual practices. Timely evaluation of fever, rash, lymphadenopathy, genital lesions, significant infectious exposures, or abnormal fetal ultrasound findings.

Conclusion

TORCH infections remain important causes of congenital and neonatal morbidity. Their clinical manifestations, diagnostic methods, fetal risks, and treatments differ substantially. Targeted diagnosis, appropriate fetal surveillance, preventive measures, and multidisciplinary management are essential. TORCH should be considered a clinical framework rather than a single laboratory diagnosis, and testing should be individualized according to the suspected infection and current clinical guidelines.

References

American College of Obstetricians and Gynecologists (ACOG). Cytomegalovirus (CMV) in Pregnancy. Updated 2025. Author/Organization: American College of Obstetricians and Gynecologists (ACOG). Published by: ACOG, Washington, DC. Year: 2025



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American College of Obstetricians and Gynecologists (ACOG). Cytomegalovirus, Parvovirus B19, Varicella Zoster, and Toxoplasmosis in Pregnancy. Practice Bulletin No. 151. Reaffirmed 2024. Author/Organization: American College of Obstetricians and Gynecologists (ACOG). Published in: Obstetrics & Gynecology. Original publication year: 2015; reaffirmed 2024.

Centers for Disease Control and Prevention (CDC). Pregnancy and Rubella. Author/Organization: Centers for Disease Control and Prevention (CDC). Published by: CDC, Atlanta, Georgia. Year: 2025.

Centers for Disease Control and Prevention (CDC). Clinical Care of Toxoplasmosis. Author/Organization: Centers for Disease Control and Prevention (CDC). Published by: CDC, Atlanta, Georgia. Year: 2026.

Centers for Disease Control and Prevention (CDC). Clinical Overview of CMV and Congenital CMV. Author/Organization: Centers for Disease Control and Prevention (CDC). Published by: CDC, Atlanta, Georgia. Year: 2024.

Centers for Disease Control and Prevention (CDC). Genital Herpes – STI Treatment Guidelines. Author/Organization: Centers for Disease Control and Prevention (CDC). Published in: Sexually Transmitted