Cytomegalovirus (CMV) in Pregnancy
Frequently Asked Questions

These FAQs were developed by a work group of practicing obstetrician–gynecologists and ACOG members with expertise in obstetrics, maternal–fetal medicine, infectious diseases, and hospital systems. They are based on expert opinion and are intended to supplement ACOG Practice Bulletin No. 151, Cytomegalovirus, Parvovirus B19, Varicella Zoster, and Toxoplasmosis in Pregnancy. These FAQs may be updated or supplemented to incorporate new data and relevant information as needed.

Patients: Please refer to this page for information on infections in pregnancy.

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Q: What is CMV?

Cytomegalovirus (CMV) is a ubiquitous double-stranded DNA herpesvirus that is transmitted by sexual contact or direct contact with infected blood, urine, or saliva. After an incubation period of 28–60 days (mean, 40 days), CMV infection induces immunoglobulin M (IgM) antibody production followed by an IgG antibody response. Viremia can be detected for 2–3 weeks after primary infection (infection in a previously seronegative individual). After the primary infection, CMV remains latent in host cells and recurrent, or secondary, infection can occur. Secondary infection (intermittent viral excretion in the presence of host immunity) can occur after reactivation of the latent endogenous CMV strain or by reinfection with a different exogenous viral strain (1).

Q: Are some individuals at higher risk of CMV infection than others?

Cytomegalovirus infects people of all ages. In the United States, nearly one in three children is already infected with CMV by age 5. More than one-half of adults have been infected with CMV by age 40 (2). Data suggest that individuals who interact with young children, such as childcare workers and those in families with young children, have a higher exposure rate than others (1). In two studies, increasing parity was associated with increasing CMV seroprevalence (1).

Q: How common is congenital CMV?

Cytomegalovirus is the most common congenital infection, occurring in 0.2–2.2% of all neonates. Most infants with congenital CMV are asymptomatic at birth; however, the effects of congenital CMV can be lifelong (1).

Q: What are the rates of infection for pregnant people?

Cytomegalovirus infection can occur during pregnancy. The incidence of primary CMV infection among previously seronegative pregnant people in the United States ranges from 0.3% to 4%. For those who are seropositive before a pregnancy, developing a secondary CMV infection is a possibility, although there are no clinically available diagnostic assays to detect secondary infection. Secondary infection can be due to either a reactivation or a reinfection with another viral strain (1).

Q: What are the risks of vertical transmission of CMV to the fetus during pregnancy?

Vertical transmission of CMV may occur because of transplacental infection after primary or secondary infection, exposure to contaminated genital tract secretions at delivery, or breastfeeding. Transplacental CMV transmission represents the most significant risk of developing clinical sequelae. Cytomegalovirus infection resulting from exposure to infected cervical secretions or breast milk is typically asymptomatic and is not associated with severe neonatal sequelae (1).

With primary maternal CMV infection, the overall risk of transmission to the fetus is approximately 30–40%. Transmission rates for primary infection are 30% in the first trimester, 34–38% in the second trimester, and 40–72% in the third trimester. Vertical transmission after a recurrent infection is approximately 0.15–2% (1). Infants infected after maternal CMV reactivation generally are asymptomatic at birth. Congenital hearing loss is typically the most severe sequela of secondary infection, and congenital infection after recurrent infection is unlikely to produce severe sequelae (1).

Q: What are the signs and symptoms of CMV infection during pregnancy?

Although adults with primary CMV infection are usually asymptomatic, individuals may experience a mononucleosis-like syndrome, with fever, chills, myalgias, malaise, leukocytosis, lymphocytosis, abnormal liver function, and lymphadenopathy (1).

Congenital CMV may be suspected prenatally after a documented maternal primary infection or, more commonly, because universal screening is not recommended, after ultrasound findings suggestive of infection. These findings include abdominal and liver calcifications, hepatosplenomegaly, echogenic bowel or kidneys, ascites, cerebral ventriculomegaly, intracranial calcifications, microcephaly, hydrops fetalis, and growth restriction (1).

Q: Is routine screening for CMV before or during pregnancy recommended?

Routine serologic screening of pregnant individuals for CMV is not recommended. The vast majority (approximately 90%) of positive IgM results are false positive and likely due to cross-reactivity with other non-CMV antibodies (3). The limitations of maternal IgM antibody screening in differentiating primary from recurrent infection also make the results difficult to use in counseling patients about fetal risk. In addition, maternal immunity does not eliminate the possibility of fetal infection. The lack of a vaccine for prevention or a proven treatment to prevent congenital transmission further diminishes the potential benefit of universal screening (1).

Q: What should obstetric care clinicians know about diagnosing CMV in a pregnant individual?

Most adult CMV infections are asymptomatic, which makes recognition of primary infection difficult. Cytomegalovirus infection in adults usually is established by serologic testing. Serum samples collected 3–4 weeks apart, tested in parallel for anti-CMV IgG, are pathognomonic for the diagnosis of primary infection. Seroconversion from negative to positive or a significant increase (greater than fourfold [eg, from 1:4 to 1:16]) in anti-CMV IgG titers is evidence of infection. In addition, the use of IgG avidity assays, which measure the maturity of the IgG antibody, combined with IgM titers allows for improved identification of primary infection (sensitivity of 92%) when compared with standard serial serologic assays. It should be noted that the presence of CMV IgM alone is inadequate for diagnosis of primary infection as there is a 90% false-positive rate (1, 3).

Congenital CMV may be suspected prenatally after noting ultrasound findings suggestive of infection. These findings include abdominal and liver calcifications, hepatosplenomegaly, echogenic bowel or kidneys, ascites, cerebral ventriculomegaly, intracranial calcifications, microcephaly, hydrops fetalis, and growth restriction. Nevertheless, such findings are more likely to be associated with other etiologies, such as aneuploidy, and the positive predictive value of each of these ultrasound markers for CMV infection is low. The presence of echogenic bowel, for instance, is only predictive of CMV infection approximately 3% of the time.

Q: What should obstetric care clinicians know about diagnosing CMV in the fetus?

After detection of maternal infection or suspected fetal infection based on ultrasound findings, CMV can be detected in the amniotic fluid of infected fetuses by either culture or PCR. Fetal blood sampling, which is less sensitive than amniotic fluid testing and carries additional risks for the fetus, is not warranted. The sensitivity of CMV amniotic fluid culture ranges from 70% to 80% compared with a sensitivity of 78–98% for PCR (specificity of 92–98%) (1). In the setting of maternal CMV infection, the sensitivity of amniotic fluid testing for prenatal diagnosis of congenital CMV infection is increased by waiting 6–8 weeks or longer after infection or after 21 weeks of gestation (4). Although a positive culture of PCR is highly predictive of congenital infection, the detection of CMV in amniotic fluid does not predict the severity of congenital CMV infection (1).

Q: How should maternal and fetal CMV infections be managed?

Currently, no therapies are approved by the U.S. Food and Drug Administration (FDA) for the treatment of maternal or fetal CMV infection. Antiviral medications such as ganciclovir, valganciclovir, and foscarnet are approved by the FDA for the treatment of CMV infection only in patients with acquired immunodeficiency syndrome or organ transplants.

Valacyclovir is not FDA-approved for the prevention or treatment of CMV in any setting. A randomized controlled trial in Israel demonstrated a potential benefit of prevention of congenital infection when a high dose of valacyclovir (8 g/d, more than double the usual doses of the medication approved for other indications) was administered at an average of 9 weeks of gestation (5). Several retrospective studies conducted in Europe have also suggested potential benefit in both prevention and treatment, but no large, randomized trial has confirmed these findings (6, 7). Additionally, there is a 2% risk of reversible maternal renal dysfunction (8). For these reasons, routine use of valacyclovir for the prevention or treatment of fetal congenital CMV is not currently recommended outside of a research protocol.

In cases of known maternal CMV infection, referral to a maternal–fetal medicine or infectious disease specialist with expertise in pregnancy management may be warranted. Typically, serial ultrasonographic surveillance that includes assessment of fetal anatomy (eg, the cerebral ventricles) and growth is performed.

Q: How should patients be counseled about prevention of CMV?

Some have suggested that pregnant individuals should be instructed on the importance of personal hygiene and safe-handling techniques (eg, the use of latex or nonlatex gloves and rigorous handwashing after exposure to potentially infected articles, such as diapers, or respiratory secretions), as well as avoidance of sharing utensils with or kissing young children if saliva is present. Such guidelines may be difficult to implement because they may be considered impractical for parents of young children. At present, such patient instruction remains unproven as a method to reduce the risk of congenital CMV infection. Discussing handwashing as a general hygiene strategy to minimize exposure to various infections and toxins during pregnancy is reasonable.

Although several potential vaccines have been developed and tested in clinical trials, phase III studies are needed to demonstrate their efficacy and safety.

Q: Are newborns routinely screened for CMV infection?

In some states, routine screening of all newborns has been instituted. The impact of those screening programs is being evaluated.

Additional Resources

Compassionate Conversations: Congenital Cytomegalovirus
Patient Education Resource: Reducing Risks of Birth Defects
ACOG Practice Bulletin No. 151, *Cytomegalovirus, Parvovirus B19, Varicella Zoster, and Toxoplasmosis in Pregnancy*

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