

CYTOMEGALOVIRUS, CONGENITAL

REPORTING INFORMATION

- **Class B2:** Report by the end of the business week in which the case or suspected case presents and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report to the local public health department in which the reporting health care provider or laboratory is located.
- Reporting Form(s) and/or Mechanism: [Ohio Confidential Reportable Disease form](#) (HEA 3334, rev. 1/09), [Positive Laboratory Findings for Reportable Disease form](#) (HEA 3333, rev. 8/05), the local health department via the Ohio Disease Reporting System (ODRS) or telephone.
- Additional reporting information, with specifics regarding the key fields for ODRS Reporting can be located in [Section 7](#).

AGENT

Cytomegalovirus (CMV), human (beta) herpesvirus 5.

CASE DEFINITION

CDC has not published a case definition for cytomegalovirus infection. Report based on the signs and symptoms and serologic changes as described below.

Case Classification

Probable: A clinically compatible case with no laboratory results in an infant ≤ 90 days of age.

Confirmed: a clinically compatible case that is laboratory confirmed in an infant ≤ 90 days of age.

Not a Case: This status will not generally be used when reporting a case, but may be used to reclassify a report if investigation revealed that it was not a case.

SIGNS AND SYMPTOMS

Congenital infection has a spectrum of manifestations but usually is silent clinically. Some congenitally infected infants who appear healthy at birth are later found to have hearing loss or learning disability. Approximately 10 percent of infants with congenital CMV infection have profound involvement evident at birth, with manifestations including intrauterine growth retardation, jaundice, purpura, hepatosplenomegaly, microcephaly, intracerebral calcifications, and retinitis.

Infection acquired intrapartum from maternal cervical secretions or postpartum from human milk usually is not associated with clinical illness. Infection resulting from transfusion from CMV-seropositive donors to preterm infants has been associated with systemic infections, including lower respiratory tract disease.

DIAGNOSIS

Amniocentesis has been used in several small series of patients to establish the diagnosis of intrauterine infection. Proof of congenital infection requires isolation of CMV from urine, stool, respiratory tract secretions, or CSF obtained within 3 weeks of birth. Differentiation between intrauterine and perinatal infection is difficult later in infancy unless clinical manifestations of the former, such as chorioretinitis or intracranial calcifications, are present. A strongly positive CMV-specific IgM is suggestive during early infancy, but IgM antibody assays vary in accuracy for identification of primary infection.

EPIDEMIOLOGY

Source

Humans are the only known reservoirs. Cytomegaloviruses found in many animal species are not infectious to humans.

Occurrence

Infection occurs throughout the world. The prevalence is inversely related to socioeconomic status within the United States and is higher in women than in men (possibly related to contact with children).

Infections have no seasonal predilection. CMV persists in latent form after a primary infection, and reactivation can occur years later, particularly under conditions of immunosuppression.

Approximately 1 percent of all live-born infants are infected in utero and excrete CMV at birth. Risk to the fetus is greatest during the first half of gestation. Although in utero fetal infection can occur after maternal primary infection or after reactivation of infection during pregnancy, sequelae are far more common in infants exposed to maternal primary infection, with 10 percent to 20 percent diagnosed with mental retardation or sensorineural deafness in childhood and 10 percent having manifestations evident at birth.

Mode of Transmission

Horizontal transmission probably is the result of salivary contamination, but contact with infected urine also can have a role. Spread of CMV in households and child care centers is well documented. Excretion rates in child care centers can be as high as 70 percent in children 1 to 3 years of age. Young children can transmit CMV to their parents and other caregivers, such as child care staff in out-of-home child care. In adolescents and adults, sexual transmission also occurs, as evidenced by virus in seminal and cervical fluids.

Blood transfusions and organ transplantation can result in viral transmission. Vertical transmission of CMV to an infant occurs by one of the following methods: (1) in utero by transplacental passage of maternal bloodborne virus; (2) at birth by passage through an infected maternal genital tract; or (3) postnatally by ingestion of CMV-positive human milk.

Period of Communicability

Virus is excreted in urine or saliva for many months and can persist for several years following primary infection. As with other herpesviruses, once primary infection occurs, CMV persists in the body for the lifetime of the host despite the development of a vigorous immune response. Reactivation of latent virus with limited virus excretion is a common event. The presence of circulating antibody does not prevent reactivation or exogenous reinfection. About 3 percent of healthy adults are pharyngeal excretors.

Incubation Period

The incubation period for CMV is unknown for person-to-person transmission. Illness following transfusion with infected blood begins within 3-8 weeks. Infections acquired during birth are first demonstrable 3-12 weeks after delivery. Disease following tissue transplantation becomes apparent in 4 weeks to 4 months.

PUBLIC HEALTH MANAGEMENT

Case

Treatment

It is not clear whether antiviral therapy is beneficial. Ganciclovir and foscarnet are licensed for the treatment of CMV retinitis in AIDS patients, and ganciclovir is used for prevention of

CMV disease in transplant patients. Treatment needs to be continued indefinitely. Ganciclovir with immunoglobulin might be beneficial in CMV pneumonia; hyperimmune immunoglobulin may be helpful.

Although ganciclovir has been used to treat some congenitally infected infants, it is not recommended routinely because of insufficient efficacy data. One study of ganciclovir therapy of congenitally infected newborn infants with central nervous system (CNS) disease suggested that treatment decreases progression of hearing impairment. However, because of the potential toxicity of long-term ganciclovir therapy, additional study is necessary before a recommendation can be made.

Isolation

No infant or child with CMV infection should be excluded from any educational program for which he or she is otherwise eligible. The risk of exposure from such children is minimal in comparison to the unavoidable exposures to the many children in the general population who are unrecognized excretors of CMV. Hand washing, particularly after secretion contact or changing diapers, should be thorough. Standard precautions are indicated for hospitalized patients.

Contacts

The risk of spread of CMV infection is not fully known, however, when caring for children, hand hygiene, particularly after changing diapers, is advised to decrease transmission of CMV. Because asymptomatic excretion of CMV is common in people of all ages, a child with congenital CMV infection should not be treated differently from other children.

Prevention and Control

Mass screening of patients and children for CMV excretion is impractical because CMV is shed intermittently and laboratory tests are time-consuming and expensive. Screening for immunity is not recommended since the presence of antibody does not prevent reactivation of latent virus or exogenous reinfection. There is no evidence that deferring a pregnant woman from working with a known CMV-infected person will reduce her risk for acquiring the disease. Emphasis on regular, thorough hand washing and maintenance of good hygiene are the most effective means of preventing transmission of CMV. Seronegative transplant patients should receive organs from seronegative donors, if possible. Vaccines, not yet available, would be targeted at seronegative mothers and seronegative transplant recipients.

What is CMV?

CMV, or cytomegalovirus (sī-to-MEG-a-lo-vī-rus), is a common virus that infects people of all ages. Once CMV is in a person's body, it stays there for life. Most infections with CMV are "silent," meaning most people who are infected with CMV have no signs or symptoms. However, CMV can cause disease in unborn babies and in people with weakened immune systems.

CMV is a member of the herpesvirus family, which includes the herpes simplex viruses and the viruses that cause chickenpox (varicella-zoster virus) and infectious mononucleosis (Epstein-Barr Virus).

Who is at risk for CMV disease?

Anyone can become infected with CMV. Most healthy adults and children who have a CMV infection will have few, if any, symptoms. However, certain groups are at higher risk of getting CMV disease. These groups include:

- Unborn babies who are infected during pregnancy
- People with a weakened (immunocompromised) immune system

Risk of CMV infection is likely to be reduced by careful attention to good personal hygiene, such as hand washing.

How is CMV spread?

- Person to person contact (such as kissing, sexual contact, and getting saliva or urine on your hands) and then touching your eyes, or the inside of your nose or mouth
- Through the breast milk of an infected woman who is breast feeding
- Infected pregnant women can pass the virus to their unborn babies
- Blood transfusions and organ transplantations

CMV is sometimes found in body fluids, including urine, saliva (spit), breast milk, blood, tears, semen, and vaginal fluids. A person can become infected with CMV when they come in contact with infected body fluids. However, people who are CMV-positive (have been infected with CMV sometime in the past) usually do not have virus in these fluids, so the chance of getting a CMV infection from casual contact is very small.

Contact with the saliva or urine of young children is a major cause of CMV infection among pregnant women. Women who are pregnant or planning a pregnancy should follow hygienic practices (e.g., careful handwashing) to avoid CMV infection. Because young children are more likely to have CMV in their urine or saliva than are older children or adults, pregnant women who have young children or work with young children should be especially careful.

What are the signs and symptoms of CMV?

Most healthy children and adults infected with CMV have no symptoms and may not even know that they have been infected. Others may develop a mild illness. Symptoms may include fever, sore throat, fatigue, and swollen glands. These symptoms are similar to those of other illnesses, so most people are not aware that they are infected with CMV.

Most babies born with CMV (in other words, "congenital" CMV) never develop symptoms or disabilities. When babies do have symptoms, some can go away but others can be permanent.

Examples of symptoms or disabilities caused by congenital CMV:

Temporary Symptoms

- Liver problems
- Spleen problems
- Jaundice
- Purple skin splotches
- Lung problems
- Small size at birth
- Seizures

Permanent Symptoms or Disabilities

- Hearing loss
- Vision loss
- Mental disability
- Small head
- Lack of coordination
- Seizures
- Death

In some children, symptoms do not appear until months or years after birth. The most common of these late-occurring symptoms are hearing loss and vision loss. Children with congenital CMV are more likely to have permanent disabilities and symptoms that get worse if they had symptoms of CMV infection at birth. But some children who appear healthy at birth can develop hearing or vision loss over time due to congenital CMV. For this reason, if you know your baby was born with CMV, it is important to have his or her hearing and vision tested regularly.

How do I know if I have CMV?

Most CMV infections are not diagnosed because the infected person usually has few or no symptoms. However, persons who have been infected with CMV develop antibodies to the virus, which may stay in a person's body for their lifetime. Antibodies are immune proteins that are the body's response to infection.

A blood test can tell a person if they have CMV, but this test is not commonly performed. Laboratory tests can detect the virus in a person's body fluids (blood or urine) or by a tissue biopsy (a small piece of the body's tissue). CMV can also be detected in the body by measuring the antibodies (immune proteins) in the blood targeted against CMV. This is called serologic testing.

Congenital CMV disease is most likely to occur when a woman is infected for the first time during a pregnancy. This is known as a primary CMV infection. Primary infections occur in 1 percent to 4 percent of seronegative (have no CMV antibodies) pregnant women and lead to fetal infection in one-third of these pregnancies. In women who are already infected before becoming pregnant (CMV seropositive women), CMV reactivation or reinfection leads to fetal infection in less than 1 percent of pregnancies. Approximately 10 percent of congenitally infected infants who have symptoms at birth, and of the 90 percent who have no symptoms, 10 percent to 15 percent will develop symptoms over months or even years.

How do you prevent CMV during pregnancy?

No actions can eliminate all risks of becoming infected with CMV, but there are measures that can reduce spread of the disease:

- Wash hands often with soap and water, especially after changing diapers. Wash well for 15 to 20 seconds
- Do not kiss young children under the age of 5 or 6 on the mouth or cheek. Instead, kiss them on the head or give them a big hug
- Do not share food, drinks, or utensils (spoons or forks) with young children
- Do not put a child's pacifier in your mouth
- Do not share a toothbrush with a young child

If you are pregnant and work in a day care center, reduce your risk of getting CMV by working with children who are older than 2 ½ years of age, especially if you are CMV seronegative (have never been infected with CMV) or are unsure if you are seronegative.

Is there treatment for CMV?

Currently, no treatment is recommended for CMV infection in the healthy individual, including pregnant women. However, antiviral drugs ganciclovir and valganciclovir are being used for patients with weakened immune systems. Antiviral drugs are being tested in infants born with congenital CMV. Because of its strong side effects, ganciclovir should only be considered for infants with severe congenital CMV disease.

Vaccines for preventing CMV infection are still in the research and development stage.