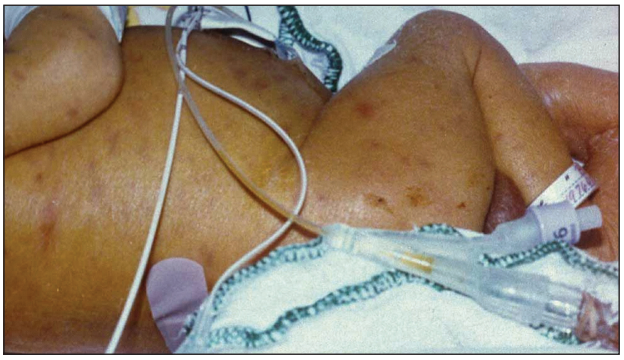
Congenital cytomegalovirus infection: What is the best way to make the diagnosis?

A male infant weighing 2640 g, measuring 48 cm and having a head circumference of 32 cm is born at term to a healthy 23-year-old primiparous daycare worker. Shortly after birth, the infant develops a widespread purpuric rash, jaundice and hepatosplenomegaly, but is clinically stable. Further laboratory evaluation reveals a hemoglobin level of 128 g/L, a platelet count of 28×10^9/L, an alanine aminotransferase level of 280 U/L and a total bilirubin level of 234 µmol/L (80 µmol/L direct). You are suspicious of a congenital infection and order a toxoplasmosis, other infections, rubella, cytomegalovirus infection and herpes simplex (TORCH) screen. The infant's serology results are as follows: cytomegalovirus (CMV) immunoglobulin (Ig) G-positive, IgM-negative; herpes simplex virus IgG-positive, IgM-negative; rubella IgG-positive, IgM-negative; and toxoplasma IgG-negative, IgM-negative. After further consideration, you decide to send viral culture samples of the urine and the throat, both of which yield CMV. How can this be? You thought that the TORCH screen covered everything. Why would the CMV IgM not be positive if the infant is, in fact, infected?

In January 2005, Canadian Paediatric Surveillance Program participants (n=2472) were asked a single prestudy question on their preferred diagnostic test for a newborn with suspected congenital CMV infection. The results were encouraging because the majority (69%) of respondents correctly chose to order a urine specimen or a throat swab for CMV culture or polymerase chain reaction. However, a further 25% indicated that they would order serology testing.



Summary of answers to cytomegalovirus (CMV) survey questions

Answer	n	%
CMV IgG and IgM on cord blood	117	14.9
Throat swab for CMV culture or PCR	10	1.3
TORCH serology	82	10.4
Urine specimen for CMV culture or PCR	537	68.3
Unknown	34	4.3
Incomplete	6	0.8
Total	786	100

Ig Immunoglobulin; PCR Polymerase chain reaction; TORCH Toxoplasmosis, other infections, rubella, cytomegalovirus infection and herpes simplex

LEARNING POINTS

- Although CMV is not highly contagious, horizontal transmission of infection in daycare centres via saliva, urine and fomites appears to play a role in the epidemiology of CMV infections in young parents. (Canadian Paediatric Society statement reaffirmed in 2005 <www.cps.ca/english/statements/ID/id92-08.htm>.)
- A woman who has a first-time CMV infection during pregnancy incurs a risk that her infant may have complications, including hearing loss, visual impairment, and diminished mental and motor capabilities.
- CMV serology in the newborn is a poor way of identifying congenital CMV infection. Although the presence of IgM is very specific for fetal and newborn infection, it is not very sensitive. Because the overwhelming infection occurs early on in gestation, the fetus does not mount a significant immune response and, in fact, develops immune tolerance for the virus. Torch the serological TORCH screen. Detection of the virus is always best.
- Isolation of the virus or detection of viral DNA using polymerase chain reaction is a very sensitive and specific method of making the diagnosis because there are massive quantities of CMV being excreted in the urine and saliva.
- Definitive diagnosis of congenital CMV infection requires isolation of the virus in the first three weeks of life because isolation beyond that age may indicate an acquired infection.
- The most important ways to avoid acquiring CMV infection while working in a childcare setting are handwashing and avoiding direct exposure to potentially contaminated body fluids (especially urine and saliva).

The Canadian Paediatric Surveillance Program (CPSP) is a joint project of the Canadian Paediatric Society and Public Health Agency of Canada that undertakes the surveillance of rare diseases and conditions in children. For more information visit our Web site at <www.cps.ca/cpsp> or <www.cps.ca/pcsp>.