Cytomegalovirus (CMV)

Cytomegalovirus (CMV) is an enveloped double stranded linear DNA virus in the herpesvirus family. It is also called human herpesvirus 5. This virus can cause a variety of infections in humans including congenital infection in infants. It is one of the TORCHES infections and can cause hearing loss, seizures, and petechial rash in newborns. In adults, infection can cause mononucleosis although 85% of mononucleosis cases are associated with EBV. Symptoms of mononucleosis include fatigue that can last for several months, sore throat, lymphadenopathy and splenomegaly. Unlike mononucleosis caused by EBV, CMV associated mononucleosis has a negative monospot test due to negative heterophile antibodies. CMV can also cause pneumonia and inflammation of the retina and esophagus in the immunosuppressed, especially in transplant recipients. Once a person becomes infected with CMV, the virus stays latent in mononuclear cells throughout his or her lifetime. Visualization of owl's eye inclusions in a cell is highly specific for cytomegalovirus infection and can aid in disease diagnosis.



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Characteristics

Enveloped
Envelope
This virus has an envelope covering its protein capsid, which is derived from its nuclear membrane when budding.

Double Stranded DNA
DNA Double-helix
CMV is a DNA virus, meaning its genetic code consists of deoxyribonucleic acid as opposed to ribonucleic acid. Like all DNA viruses except Parvovirus, CMV has double stranded DNA as its genome. CMV has DNA in a linear arrangement as opposed to circular formation.

Herpesvirus 5
Harp-virus with (5) Hand
CMV is also called human herpesvirus 5.

Diagnosis

Non Heterophile Antibodies
Nun Hat-of-files
Unlike mononucleosis caused by EBV, CMV associated mononucleosis has a negative monospot test due to negative heterophile antibodies.

Owl's eye inclusions
Owl with giant eyes
Infected specimens may contain characteristic large cells with basophilic intranuclear inclusions. The typical nuclear inclusion has the appearance of an “owl’s eye” because it can be surrounded by a clear halo that extends to the nuclear membrane. Visualization of owl's eye inclusions in a cell is highly specific for cytomegalovirus infection and can aid in disease diagnosis. You should know, this differs from the bi-lobed nucleus seen with the owl's eye inclusion of Hodgkin's lymphoma.

Signs and Symptoms

Congenital TORCH infection
Torch
This microbe can be passed from mother to fetus when the mother contracts illness during pregnancy. It is one of the TORCHES infections and can cause hearing loss, seizures, and petechial rash in newborns.

Mononucleosis
Monkey-nuclear
CMV infection can cause mononucleosis although 85% of mononucleosis cases are associated with EBV. Symptoms of mononucleosis include fatigue that can last for several months, sore throat, lymphadenopathy and splenomegaly. Unlike mononucleosis caused by EBV, CMV associated mononucleosis has a

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Pneumonia

Nude-Mona

Cytomegalovirus pneumonia is an infection seen in immunocompromised individuals. Often we see this specific infection in patients with AIDS, those with bone marrow or organ transplants, and patients who are on chemotherapy.

AIDS retinitis and esophagitis

Band-AIDS on Red-tin-eyes and sarcophagus

CMV retinitis refers to inflammation of the retina that can lead to blindness and occurs almost exclusively in the immunocompromised including AIDS patients. Symptoms include blurred vision, eye pain, photophobia and can cause blindness. CMV esophagitis refers to inflammation of the esophagus caused by CMV virus. In contrast to esophagitis caused by herpes simplex virus, it is more likely to present with a deep, linear ulcer as opposed to the multiple, more shallow ulcers of HSV.

Infection in transplant recipients

Train-plant

Transplant recipients are at high risk for CMV infections, especially 5-13 weeks after transplant. CMV should be high on the differential in individuals with signs of infection after transplantation.

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