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Commentary

Clinical Manifestations and Diagnosis of Human Cytomegalovirus Infections

Yann Atwood*

Department of Immunology, University of Tornto, Ontario, Canada

ABOUT THE STUDY

Human Cytomegalovirus (HCMV) is a widespread herpesvirus that can cause significant morbidity and mortality, particularly in immunocompromised individuals and congenitally infected infants. The clinical manifestations and accurate diagnosis of HCMV infections are crucial for proper management and treatment. Here's a comprehensive overview encompassing clinical presentations and diagnostic methods.

Clinical manifestations

Asymptomatic infections: In healthy individuals, HCMV infections often remain asymptomatic or manifest as mild flu-like symptoms, making diagnosis challenging without specific testing.

Congenital infections: In infants, congenital HCMV infections can lead to severe complications like microcephaly, hearing loss, developmental delays, and vision impairment.

Immunocompromised individuals: In immunosuppressed patients, such as those with HIV/AIDS, organ transplant recipients, or patients undergoing chemotherapy, HCMV infections can cause severe diseases including retinitis, pneumonia, hepatitis, and gastrointestinal issues.

HCMV mononucleosis: Similar to Epstein-Barr Virus (EBV) mononucleosis, HCMV can cause a mononucleosis-like syndrome with symptoms like fever, sore throat, fatigue, swollen lymph nodes, and malaise.

Organ-specific manifestations: HCMV can target specific organs, leading to diverse manifestations such as retinitis, causing vision loss; pneumonitis, resulting in respiratory distress; and hepatitis, leading to liver dysfunction.

Diagnosis

Serology testing: Serological tests detect antibodies against HCMV, including IgM (indicating recent infection) and IgG (suggesting past exposure). However, IgM can persist, making interpretation challenging, especially in immunocompromised individuals.

Viral culture: Culturing HCMV from bodily fluids or tissues remains a gold standard but can be time-consuming and may lack sensitivity, especially during asymptomatic or latent infections.

Nucleic acid amplification: Polymerase Chain Reaction (PCR) assays amplify HCMV DNA, enabling sensitive and specific detection from blood, urine, saliva, or tissue samples. Quantitative PCR aids in monitoring viral load in immunocompromised patients.

Antigenemia assays: Detecting HCMV-specific antigens in leukocytes through immunofluorescence assays provides a rapid diagnostic method, particularly valuable in transplant patients for early detection and management.

Histopathology: Tissue biopsies revealing characteristic cytomegalic cells with intranuclear inclusions support the diagnosis, especially in severe cases like organ involvement or suspected congenital infections.

Imaging studies: Radiological investigations, such as retinal exams for retinitis or chest X-rays for pulmonary involvement, assist in diagnosing HCMV-related organ-specific diseases.

Prenatal screening: Screening pregnant women for HCMV antibodies and using PCR on amniotic fluid or ultrasound monitoring for fetal abnormalities aid in early identification of congenital infections.

Clinical manifestations of HCMV infections vary widely, ranging from asymptomatic cases to severe diseases with potentially life-threatening complications. Accurate diagnosis is essential for appropriate patient management, especially in the immunocompromised individuals and pregnant women.

Utilizing a combination of serological, molecular, and imaging techniques enables a comprehensive approach to diagnose HCMV infections, ensuring timely intervention and reducing associated morbidity and mortality. Ongoing research continues to refine diagnostic methods and develop targeted therapies to improve outcomes for individuals affected by HCMV infections.

Correspondence to: Yann Atwood, Department of Immunology, University of Tornto, Ontario, Canada, E-mail: atya.wood@edu.ca

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