

Cytomegalovirus (CMV) Factsheet

What is CMV?

CMV is a common virus which belongs to the herpes virus family.¹ It is estimated that 50-80% of adults in the United States have been infected with CMV by 40 years of age² and 40-80% of adults in the United Kingdom aged 40 and over.³ Like most other herpes type viruses, once someone becomes infected with CMV, it will remain dormant in their body for life. CMV can be transmitted from person to person through close bodily contact, but in most cases it causes no or very few symptoms.³

CMV usually only presents a problem when it develops in certain vulnerable groups, including people with weakened immune systems (for example, transplant recipients and AIDS patients), and pregnant women.⁴

CMV infection in transplant recipients

Transplant recipients are particularly at risk of developing CMV infection because they are required to take medicines that suppress their immune system.³ CMV is the most important serious infection complicating solid organ transplantation^{5,6,7} and usually develops during the first few months after transplantation.⁷ CMV affects up to 75% of all solid organ transplant recipients.⁸ It is a major cause of morbidity and mortality during the first six months after transplantation.^{9,10}

Transplant recipients can develop CMV infection through a number of different routes:

1. Acquired or primary infection (D+/R-)

Transplant recipients that are at the highest risk of developing this disease are donor CMV seropositive/recipient CMV seronegative patients (D+/R-).⁷ These are patients who contract CMV for the first time after receiving a donor organ that is infected with CMV.⁷

2. Reactivation or reoccurring infection (D-/R+)

A previously dormant CMV infection can reoccur in transplant recipients with weakened immune systems.^{3,7}

3. Superinfection (D+/R+)

CMV seropositive recipients who receive an organ that is -donor CMV seropositiveøare also at risk of developing superinfection, especially if they are taking intense immunosuppressive drugs.⁷

CMV infection in transplant recipients – what are the effects?

CMV infection can lead to direct and indirect complications in transplant recipients resulting in CMV disease. Direct effects include:^{7,11}

- Fever
- New or increased malaise (general feeling of being unwell and often the first indicator of a disease)¹²
- Leukopenia (abnormally low white blood cell count)¹³
- Organ complications (liver, lung, brain, kidneys and gastrointestinal tract) which if left untreated can result in a mortality rate as high as 90%

Indirect complications are not linked to the virus but may be linked to the immune response generated by the body. These include:⁷

- Acute and/or chronic organ injury and rejection
- Increased susceptibility to bacterial, fungal and other opportunistic infections^{11,14}

Treatment strategies

There is no cure for CMV,³ however, in organ transplant three strategies have been adopted for preventing CMV disease:¹⁵

1. -Universal prophylaxisøó administration of anti-CMV drugs for all patients, regardless of their risk status for CMV disease
2. -Selective prophylaxisøó administration of anti-CMV drugs only for those patients considered at high risk
3. -Pre-emptive therapyøó administration of anti-CMV drugs upon detection of CMV viremia

It is still possible for CMV to develop after treatment. Studies have shown that over 30% of patients develop late CMV disease after cessation of preventative (prophylaxis) therapy.^{16,17,18}

Anti-viral prophylaxis

Anti-viral agents have proved to be successful in the prevention of CMV infection and disease in solid organ transplant recipients.¹⁹ Intravenous (i.v.) ganciclovir was originally the mainstay for both CMV prevention and treatment,^{20,21,22} before an oral formulation was developed as an alternative.¹⁷ However, limitations remained in the degree of viral suppression that could be achieved with this drug,¹⁵ which may lead to ganciclovir resistant CMV.²³

Valcyte (valganciclovir), a prodrug of ganciclovir, was developed to overcome the limitations of both oral and i.v ganciclovir.²⁴ Valcyte is an oral antiviral agent indicated for the prevention of cytomegalovirus (CMV) disease in kidney, heart and kidney-pancreas transplant patients at high risk (Donor CMV seropositive/recipient CMV seronegative [D+/R-]) for up to 100-days post transplant.²⁵

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