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Abstract (publication only)

Diagnosis and monitoring of active cytomegalovirus (CMV) infection in patients with haematological malignancies: the impact of molecular assays

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Objectives: CMV infections are important causes of morbidity and mortality for patients with a hematological malignancy. The true incidence and consequences of CMV infections for these patients who undergo conventional therapy are not adequately defined. Well-designed prospective studies are needed to better clarify the spectrum of these viral infections in order to develop effective prevention and treatment strategies. The aim of this study was to investigate the impact of quantitative PCR (Q-PCR) on diagnosis and monitoring of an active CMV infection in patients with a hematological malignancy (nontransplant). Methods: The study included 106 hospitalized patients with a hematological malignancy and clinical manifestations of recent CMV infection. Plasma samples were collected from all patients and were processed with Q-PCR (Cobas Amplicor, Roche Diagnostics). Serum CMV antibody (IgG and IgM) titers were measured with microparticle enzyme immune assay (AxSYM, Abbott) in all CMV-DNA positive patients. The association between viral load in plasma and clinical data was also investigated. Results: By performing PCR 14 cases of active infection were diagnosed, where IgM antibodies were detected in none of them. Chronic lymphocytic leukemia (C.L.L.) was the major underlying disease, noted in 12 (86%) patients. All CMV-DNA positive patients had clinical manifestations compatible with active CMV infection. Among them pneumonitis was the most common (86%), followed by systemic infection. Overall, the median CMV viral load (VL) was 6.015 copies/ml (650-58.800). The overall mortality rate was 29%. Major cause of death was respiratory failure. Opportunistic infections were noted in 14% caused by Staphylococcus spp. All CMV PCR positive patients received ganciclovir on the day that positivity was documented. The treatment led to a marked decrease in CMV DNA copy number. The median time interval necessary to obtain a negative result after implementation of treatment by CMV PCR assay was 27 days (range 13-40 d). Conclusion: Quantitative PCR CMV assay is rapid, and linear for quantifying CMV viral load in patients with haematological malignacies. It has become a mainstay of clinical management helping deployment of antiviral therapy and assess response therapy. Compared with traditional serologic assays that detect antibodies to CMV, Q-PCR offers a significant advance through the direct detection of viral DNA, which is independent of a functioning humoral immune system.