Abstract

Part I: The aim of the present study was to evaluate the impact of highly active antiretroviral therapy (HAART) in HIV viral load of plasma and intraocular fluids in AIDS patients with ophthalmic opportunistic infections. We further compared the treatment effect of HAART on these patients. From June 1997 to July 2003, we examined and followed up the ophthalmic conditions of 49 patients receiving HAART were confirmed with ophthalmic diseases during this period. The method of reverse transcriptase-polymerase chain reaction (RT-PCR) was used to detect and monitor HIV load in plasma and/or aqueous humor of AIDS patients. Before HAART, HIV levels in the plasma and aqueous humor in 8 AIDS with ophthalmic opportunistic infections were significantly higher than those in 6 patients with HIV-related retinopathy ($p<0.05$). Compared to the eye findings and clinical improvement, HIV loads of aqueous humor in ten of 14 AIDS patients (six with HIV-related retinopathy, five with CMV retinitis, two with toxoplasmic retinitis, and one cryptococcal chorioretinitis) were declined to undetectable level (<400 copies/ml) after 4 to 8 months HAART. HIV virus levels in plasma of AIDS patients were significantly decreased and the CD4 counts of these patients were significantly increased (Wilcoxan test) after initiation of HAART.

Part II Human cytomegalovirus (HCMV) infection usually develops asymptomatic lifelong infection in healthy individuals, but can cause severe clinical complications such as HCMV retinitis when reactivated in immunocompromised patients. Although the detailed mechanisms of HCMV latency and reactivation are not yet well understood, accumulating evidences suggest that the virus can use a panel of viral proteins to escape from cellular immune control and thus, successfully survive and replicate in host cells. Cellular immune reactions and the associated inflammatory responses can be harmful to nearby tissues. Since minor inflammation can result in impaired vision or even blindness, the eye is naturally designed as an immune privileged site where infections usually do not lead to destructive immune reactions.

The question as to how HCMV infection causes retinal pathogenesis and visual destruction in AIDS patients remains unresolved. To answer the question, by using terminal deoxynucleotidyl transferase-mediated deoxyuridine triphosphate nick end labeling (TUNEL) assay, we detected the significant signals of apoptotic cells at the same sites in the HCMV-infected retina of AIDS patients as compared to AIDS patients without HCMV retinitis. To support this idea, we observed augmented soluble FasL (sFasL) levels in vitreous from

AIDS patients with HCMV retinitis as compared to that from AIDS patients without HCMV infection. In addition, by in situ hybridization and immunohistochemistry, we detected enhanced signals of FasL, the existence of viral IE antigens and apoptotic cells at the same sites in the lesion of HCMV-infected retina. These results strongly suggest that IE2 induction of FasL expression in human retina might be an important event that takes place in the early stage of infection and finally leads to visual loss in individuals affiliated with HCMV retinitis.

Keywords：AIDS；CMV retinitis；HIV viral load