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Cytomegalovirus Infection of Newborns Infected with HIV-1 from Mother: Case Report

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In addition to *Pneumocystis carini*, cytomegalovirus (CMV) is an important opportunistic pathogen in HIV-1-infected patients, particularly in pediatric patients. We present here CMV infection observed in two mother-to-child HIV-1 infection cases.

Case 1: A boy was born to an HIV-1 positive mother. His father was also HIV-1 positive. They were ignorant of their own infection until the baby was found to be HIV-1 infected.

He was delivered at the 39th gestation week by Caesarean section. The body weight was 3,300 g. He received both breast and bottle feeding. He was admitted to a hospital at the age of 2 months for pneumonia and bronchitis. He was intubated and his breathing was controlled by an artificial respirator. Increase of anti-CMV IgM suggested CMV infection. His condition deteriorated gradually. When he was found to be HIV-1-infected at the age of 6 months, he was sent to our hospital. His CD4 count was 46/μl, and HIV-RNA was 2.7×10^6 copies/ml. The clinical stage was CDC class C. HARRT consisting of zidovudine (AZT), lamivudine (3TC), and nelfinavir (NFV) was immediately started. On the fifth day of HARRT, bilateral retinal vasculitis, edema, and bleeding were detected. As CMV antigenemia was present (3 CMV-positive cells/1.5×10^5 white blood cells), intravenous (i.v.) administration of gancyclovir every 12 h at a dose of 5 mg/kg/day was started on day seven. As the retinal condition recovered after 29 days of the treatment, the dose was reduced to a maintenance dose of 5 mg/kg/day. After 13 days of the maintenance dose, the retinal lesion did not reoccur. The gancyclovir treatment was switched to an oral maintenance dose of 50 mg/kg/day and the patient was discharged. For prevention of retinal detachment, retinal laser photocoagulation and intraocular inoculation of gancyclovir were performed under anaesthesia on days 35 and 77. On day 32, HIV-RNA decreased to 4×10^4 copies/ml and CD4 count rose up to 136/μl.

Case 2: A boy was born to an HIV-1 positive mother. She was ignorant of her own infection until the boy was diagnosed as HIV-1 positive. The boy was born via a normal vaginal delivery and his body weight was 3,016 g. At the age of 3 months, he developed carini pneumonitis and symptoms of CMV infection. He was found to be HIV-1 positive and sent to our hospital at the age of 7 months. His CD4 count was 949/μl. HIV RNA was 7.3×10^5 copies/ml. From the clinical symptoms, he was in the stage of CDC class B. HARRT consisting of AZT, 3TC, and NFV was started. After 14 days of HARRT, his CD4 count recovered to 2,284/μl, and HIV RNA decreased to 3.2×10^3 copies/ml. On the 19th day, CMV antigenemia (8 CMV-positive cells/1.5×10^5 white blood cells) appeared. On day 21, as a white lesion due to CMV retinitis in the right eyeground was detected, gancyclovir treatment which had been started with an oral dose of 30 mg/kg/day since admission was switched to the therapeutic dose (i.v. dose of 5 mg/kg/12 h). As the eyeground lesion diminished in 25 days, the dose was reduced to the maintenance dose (i.v. dose of 5 mg/kg/day). However, after 12 days of the maintenance dose, relapse of the eyeground lesion was noted and the gancyclovir dose was returned to the therapeutic dose. As the retinitis worsened with the decrease of gancyclovir dose, the continued administration of gancyclovir with close monitoring of both the eyeground lesion and the side effects of the treatment was necessary. In this patient, no clear relation between the level of CMV antigenemia and the severity of retinitis was noticed.

In both cases, the CMV retinitis was detected shortly after the start of HARRT. But, as the babies had not been examined for the eyeground before, the relation between HARRT and the development of the retinitis was unclear. They had probably already had the CMV retinitis before the initiation of HARRT.

In case 1, the control of CMV infection was relatively easy though the patient's general condition including CD4 count and HIV-1 viremia was poor. In case 2, the control of CMV infection was difficult despite the relatively strong control of CD4 and HIV viremia. The reason for these apparently contradictory results was not clear. One possibility is that it was caused by a wide variation among individuals as to when the anti-CMV starts to be produced, i.e., the case 2 baby may have developed anti-CMV antibody later than the case 1 baby.

The anti-CMV antibody positivity rate among pregnant women is higher in Japan than in European countries or the US (1-2). Consequently, the risk of CMV infection in newborns in Japan is considered higher. Both babies presented in this report must have been infected by HIV-1 and CMV during delivery or after birth.

CMV infection reportedly aggravates the clinical course of HIV-1 infected babies: half of the reported cases either died or attained the class C symptom stage within 18 months, and complications of the central nervous system have been found in 30% of the cases (3). Therefore, early diagnosis of CMV infection is important. Systematic ophthalmological examination of babies born to HIV-1 positive mothers will be necessary. If the babies are found CMV-infected, treatment for CMV as well as that for HIV-1 should be started. But the

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present regimens of the combined therapy have to be further evaluated. It will be also important to take measures for preventing mother-to-child CMV infection, such as treatment with hyperimmune anti-CMV sera or vaccination (4).

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