nodeficiency (SCID-X1) in patients without an HLA-matched donor for bone marrow transplant.

STUDY POPULATION. All 4 children with SCID-X1 resulting from a γ/γ chain mutation and without an HLA-identical sibling referred to Great Ormond Street Hospital (London, United Kingdom) between July 2001 and December 2002 were offered and consented to receive gene therapy.

METHODS. The complete coding region of human γ/γ was cloned into a pMFG gammaretroviral vector and transfected into bone marrow CD34+ stem cells for reinfusion into the patients. T-cell function was assessed by responses to mitogens, Candida antigen, and mixed lymphocyte reactions. T-cell receptor (TCR) repertoires were assessed by direct immunofluorescence with fluoro- phocyte reactions. T-cell receptor (TCR) repertoires were monitored in individual V-β families. Two patients developed normal numbers of CD3, CD4, and CD8 cells, allowing discontinuation of prophylactic medications. One of these patients developed a maculopapular rash on the palms and soles after CD4 T-cell recovery. Another patient had gastrointestinal bleeding resulting from rejection of engrafted maternal cells. The eldest patient, who received gene therapy at 33 months of age, had slower lymphocyte recovery. All patients developed normal T-cell–proliferative responses to mitogens, antigens, and mixed lymphocyte reactions. One year after treatment, all patients showed normal TCR-β usage and polyclonality within individual V-β families. Two patients maintained normal immunoglobulin levels after discontinuing replacement, and normal serologic responses to vaccines were documented in 1 patient. Somatic mutation analysis of the patient’s peripheral blood for the Fip1-like-1 platelet-derived growth factor receptor α chain (FIP1L1-PDGFRA) fusion tyrosine kinase associated with HES in adults was negative. Open lung biopsy revealed patchy interstitial and intra-alveolar inflammation with a predominance of eosinophils. A skin biopsy showed acute neutrophilic folliculitis with perivascular inflammation with a predominance of eosinophils. Bone marrow biopsy demonstrated a hypercellular marrow with predominantly eosinophils, which is consistent with idiopathic HES.

METHODS. The investigators compared this case report of pediatric HES and additional published cases of pediatric and adult patients with HES.

RESULTS. Pediatric HES has only a slight male predominance (55.3% male vs 44.7% female), whereas adult HES is more common among males than females, with a ratio of 9 to 1. In adults, the frequencies of symptoms found on presentation are: fatigue (26%), cough (24%), dyspnea (16%), rash (12%), and fever (12%). Fever (58.8%), arthralgias (23%), and rash (23.5%) were more common in pediatric cases. As with adults, involvement of the cardiovascular system is the major source of morbidity and mortality. Pediatric HES is commonly associated with chromosomal abnormalities, including enhancer-mediated activation of the T-cell protooncoprotein LMO-2. Additional longitudinal studies will help to determine the duration of reconstitution and quantify the risk of adverse events.
and in ~40% of the cases, it has been associated with acute leukemia. As opposed to the vast majority of adult HES cases, no pediatric case with the FIP1L1-PDGFRα fusion gene has been reported.

CONCLUSION. There are several distinct features of pediatric, compared with adult, HES.

REVIEWER COMMENTS. Most of the published information on the HES has focused on adult patients. This report compares a pediatric case report of HES and a review of published pediatric cases of this condition to adult patients with this syndrome. This is an insightful clinical report that should be useful in the overall workup of pediatric patients who present with dramatic eosinophilia (>1500/mm³) for >6 months’ duration without other known causes of eosinophilia and who have evidence of organ involvement that might be attributable to HES.

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HUMAN IMMUNODEFICIENCY VIRUS

HIV-Infected Individuals Receiving Effective Antiviral Therapy for Extended Periods of Time Continually Replenish Their Viral Reservoir


PURPOSE OF THE STUDY. Latently infected, resting CD4⁺ T cells provide a reservoir for HIV, and the persistence of these cells prevents the eradication of HIV even in patients who have received highly active antiretroviral therapy (HAART) for prolonged periods. The purpose of this study was to examine the underlying mechanisms by which HIV persists in CD4⁺ T cells in individuals treated effectively for up to 9 years.

METHODS. Eleven HIV-infected subjects were studied. These individuals had received effective therapy for an average of 8 years (range: 7.16–9.1 years). None of the patients had experienced detectable plasma viremia after initial suppression. Peripheral blood cells were obtained sequentially on all individuals and studied for the presence of replication-competent virus.

RESULTS. All infected subjects carried replication-competent HIV in their CD4⁺ T cells despite having received prolonged, effectively suppressive antiviral therapy. Contrary to current thinking, substantial higher levels of HIV proviral DNA were found in circulating activated CD4⁺ T cells when compared with the resting subset. Sequence analysis revealed evidence for cross infection between the resting and activated T-cell compartments, indicating that ongoing reactivation of latently infected, resting CD4⁺ T cells may occur in these patients.

CONCLUSIONS. Continual replenishment of the CD4⁺ T-cell reservoir occurs despite prolonged periods of plasma aviremia.

REVIEWER COMMENTS. It is only with the elimination of viral reservoirs that HIV infection can be “cured.” Resting T cells harboring proviral DNA do not live forever. However, the rate of viral replenishment in this cell compartment at least equals the natural decline in their numbers. Eliminating this cell reservoir will be a daunting task.

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Emergence of Drug Resistant HIV-1 After Intrapartum Administration of Single-Dose Nevirapine Is Substantially Underestimated


PURPOSE OF THE STUDY. An inexpensive, effective regimen to prevent perinatal HIV transmission in the developing world is highly desirable. Nevirapine, a nonnucleoside reverse transcriptase inhibitor, seems to provide such an intervention. However, drug-resistance mutations have been identified in up to 40% of women shortly after they received a single intrapartum nevirapine dose as part of a transmission-prevention strategy. This study was undertaken to reexamine the incidence of drug-resistant HIV-1 after single-dose nevirapine.

STUDY POPULATION. Fifty South African women infected with HIV subtype C.

METHODS. Sensitive, real-time polymerase chain reaction assays were sequentially performed for nonnucleoside reverse transcriptase inhibitor–resistance mutation, K103N and Y181C.

RESULTS. Resistance mutations emerged in 65% of women after a single dose of nevirapine.

CONCLUSIONS. Single-dose nevirapine as used in the developing world for prevention of perinatal HIV transmission results in the development of resistance mutations in a very high percentage of women who receive this intervention.

REVIEWER COMMENTS. Although single-dose nevirapine has been successfully implemented as a strategy to prevent perinatal HIV transmission, it is increasingly apparent that the women who are treated with this regimen more often than not develop resistance mutations to nevirapine. The clinical implications are clear: Will nevirapine
Pediatric Hypereosinophilic Syndrome (HES) Differs From Adult HES

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