Leprosy as Cause of False-positive Results in Serological Assays for the Detection of Antibodies to HIV-1

TO THE EDITOR:

Infection with the human immunodeficiency virus (HIV-1) is associated with a broad spectrum of manifestations. Its main characteristic is a relentless depletion of helper-T cells. The late stages of HIV-1 infection, the acquired immunodeficiency syndrome (AIDS), are characterized by the occurrence of infections and neoplasms, both generally associated with severe derangements of the host's immune system, particularly cell-mediated immunity.

The diagnosis of HIV-1 infection is largely dependent upon demonstrating the presence of specific antibodies. Due to the extremely high cost of the Western blot assay, the "gold standard" for serological diagnosis of HIV-1 infection, cheaper but less specific enzyme-linked immunosorbent assays (ELISAs) are used as screening tests. The ELISAs are divided into so-called "generations" according to the antigen sources utilized. First-generation tests use whole-virus antigens obtained in tissue cultures; second-generation ones employ recombinant antigens generally derived from viral-envelope proteins. It has been shown that the use of the two types of ELISA in succession virtually eliminates false-positive reactions, thus obviating the need for the more-expensive confirmatory tests ([1]).

Since the present AIDS epidemic represents an additional burden to already overstrained health systems, designing cost-effective algorithms for the diagnosis of HIV-1 infection is of paramount importance for the evaluation of the impact of HIV-1 infection on endemic diseases ([8]).

Very few published studies have attempted to analyze the mutual impact of dual infection with HIV-1 and *Mycobacterium leprae* ([2, 3, 5, 7]). Infection with the latter is associated with a high frequency of false-positive results in a variety of serological assays. Two papers published in the JOURNAL provided conflicting data on the effect of leprosy on the performance of serological assays for the detection of anti-HIV-1 antibodies ([4,6]). In the present letter, we report the results of a pilot study of HIV-1 serology in leprosy patients.

Sera from 57 multibacillary leprosy patients (lepromatous and borderline) were tested for HIV-1 antibodies. These patients are under surveillance at the outpatient unit of Curupaiti State Hospital, Rio de Janeiro, Brazil, after being treated with multidrug regimens ([9]) for periods varying between 24 and 48 months.

The algorithm we have used ([1]) for the serodiagnosis of HIV-1 infection is the following: Sera are tested in a primary screening ELISA using whole-virus antigens (Genetic Systems, Seattle, Washington, U.S.A.). If negative, the individual is considered to be noninfected. Reactive sera are then tested in a secondary ELISA that employes recombinant HIV-1 antigens (Recombigen; Cambridge Bioscience, Worcester, Massachusetts, U.S.A.). If negative, the patient is considered to be noninfected. Reactivity in the secondary ELISA is confirmed using the Du Pont Western Blot kit (Du Pont, Wilmington, Delaware, U.S.A.).

On first testing, four samples (7.02%) were reactive. On further testing, all four samples were nonreactive.

Bendet, *et al.* ([1]), using the same algorithm (and the same kits) for the serodiagnosis of HIV-1 infection, reported a false-positive rate for the primary screening ELISA of 0.43% (10/2325) in Brazilian army recruits. The difference between false-positive rates encountered in the present study and in the study by Bendet, *et al.* is highly significant ($p = 0.0002$, Fisher's Exact Test). Although different populations were analyzed, these findings suggest that leprosy is a cause of false-positivity in HIV-1 ELISAs that utilize whole virus as an antigen source.

Undoubtedly, studies are urgently needed ([8]) to evaluate the impact of HIV-1 infection in leprosy patients, as well as the impact of leprosy on the natural history of HIV-1 infection. It is of paramount importance that study designs take into account the likeli-

hood of high false-positive rates in *M. leprae*-infected individuals.

—Vera Lucia Andrade, M.D.
Joao Carlos Avelleira, M.D.
Alfredo Marques, M.D.
Francisco Reis Vianna, M.D.

Curupaiti State Hospital
Health Secretariat
Rua Godofredo Viana 64
Tanque, Jacarepagua
Rio de Janeiro 22730,
Rio de Janeiro, Brazil

—Mauro Schechter, M.D., Ph.D.

AIDS Program and
Infectious Diseases Service
Federal University of
Rio de Janeiro
Rio de Janeiro, Brazil

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