NORWEGIAN SCABIES IN PERU: THE IMPACT OF HUMAN T CELL LYMPHOTROPIC VIRUS TYPE I INFECTION

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Abstract: Isolates cases and groups of patients co-infected with human T cell lymphotropic virus type I (HTLV-I) and Norwegian scabies have been previously reported. Peru is considered to be endemic for HTLV-I. Between June 1999 and December 2000, 23 patients with Norwegian scabies were enrolled in this study after written informed consent was obtained. Antibodies against HTLV-I were detected by an enzyme-linked immunosorbent assay and confirmatory Western blot. Patients ranged in age from 3 months to 84 years; 15 (65.2%) were female. Infection with HTLV-I was found in 16 (69.6%) patients. Comorbid features included corticosteroid therapy (8.6%), malnutrition (8.6%), and Down’s syndrome (4.3%). Among those who consented to be tested for human immunodeficiency virus (n = 13, 56.5%), no one had a positive result. The three patients that reported one or more prior episodes of Norwegian scabies were infected with HTLV-I and two of these HTLV-I-positive patients died. Infection with HTLV-I is an important co-factor related to Norwegian scabies in Peru. In our setting, the evaluation for HTLV-I in all Norwegian scabies cases is highly recommended, especially when no other risk factors are apparent.

INTRODUCTION

Norwegian scabies or crusted scabies is an infrequent, albeit severe, infection caused by massive infestation with Sarcoptes scabiei var. hominis. The disease was first described in Norway by Danielsen and Boeck in 1844 and was subsequently named Norwegian scabies by Hebra. The disease is characterized by the presence of crusted and hyperkeratotic lesions located mainly in pressure areas. Infestation by ectoparasite leading to dermatologic manifestations seems to be related primarily to host factors. Accordingly, Norwegian scabies has been reported in patients receiving immunosuppressive therapies, such as corticosteroids or radiotherapy, as well as in patients with leukemia, human immunodeficiency virus (HIV) infections, Down’s syndrome, lepromatous leprosy, diabetes, Bloom’s syndrome, and occasionally in apparently healthy patients. Human T cell lymphotropic virus type I (HTLV-I), the first human retrovirus identified, was initially associated with adult T cell lymphoma/leukemia (ATLL) and later with tropical spastic paraparesis (TSP), Strongyloides stercoralis hyperinfection syndrome, uveitis, and other clinical conditions. Isolated cases and groups of HTLV-I-infected patients co-infected with Norwegian scabies have been previously reported. Perú is considered to be endemic for HTLV-I, with an estimated prevalence in the general population ranging between 1% and 5%. The objective of this study was to determine the extent of concurrent infection with HTLV-I in a population of patients with Norwegian scabies referred to a tertiary care medical setting in Peru.

MATERIALS AND METHODS

Setting. A prospective study was conducted from June 1999 to December 2000 at the Institute of Tropical Medicine Alexander von Humboldt in Lima, Peru in which the Department of Infectious Diseases, Tropical Medicine and Dermatology of the Hospital Nacional Cayetano Heredia is located.

Procedures. Dermatologists from six major Peruvian public hospitals referred to our institute patients that had clinical diagnosis of Norwegian scabies during the study period. The sole inclusion criterion was a confirmed diagnosis, as demonstrated by skin scraping and/or a biopsy where eggs, larvae, and adult forms of S. scabiei were observed by standard microscopic techniques. All patients completed a standard questionnaire to obtain relevant clinical data. Testing for HTLV-I was done by an enzyme-linked immunosorbent assay (ELISA) (Cambridge Bioscience, Worcester, MA) and confirmed by a Western immunoblot (Du Pont, Wilmington, DE). The HIV ELISA test with adequate pre-counseling and post-counseling was later offered to patients whose HIV status was unknown. Patients were followed for a period of three weeks. Informed consent was obtained from all patients (or their parents in the case of minors) at the first visit. This study was reviewed and approved by the Ethical Committee of the Universidad Peruana Cayetano Heredia.

RESULTS

During the study period, 27 patients were referred to our Institute with a diagnosis of Norwegian scabies; 23 (85.2%) agreed to participate and were included. Fifteen (65.2%) were females. The mean ± SD age at diagnosis was 44.7 ± 27.5 years (age range = 3 months to 84 years). Five (21.7%) were children less than 16 years old. Nineteen (82.6%) were mestizos, two (8.7%) were Quechua (Andean natives), and two (8.7%) were white.

The diagnosis was microscopically confirmed in all 23 patients. Crusted lesions affected the elbows, knees, buttocks, palms and soles, thorax, ears, scalp, and nails (Figures 1 and 2). Three (13.0%) of 23 patients reported a complete absence of itching.

Sixteen (69.6%) patients were infected with HTLV-I, including four with HTLV-I-associated TSP and one with ATLL. Two (8.6%) patients were receiving long-term oral corticosteroid therapy due to dermatomyositis, one had Down’s syndrome, and two were chronically malnourished.
With regard to HIV status, among those who agreed to be tested (n = 13), all had negative results. In two patients, no risk factors were identified. Three patients reported one or more prior episodes of Norwegian scabies and all three were infected with HTLV-I.

During the follow-up period, three patients who were HTLV-I positive died a few days after the diagnosis of Norwegian scabies. One died due to Pseudomonas aeruginosa sepsis, the second of non-Hodgkin’s lymphoma and terminal chronic renal insufficiency, and the third of nosocomial pneumonia associated with chronic corticosteroid therapy. None of the patients included had psychiatric alterations, and none reported alcohol consumption or intravenous drugs use.

**DISCUSSION**

The clinical observations in this report suggest that HTLV-I infection should be sought in those cases of Norwegian scabies for which an underlying risk factor is not apparent, particularly in regions where HTLV-I infection is endemic or commonly imported.

The distribution of the crusted, hyperkeratotic lesions was similar to what has been described in the literature. The absence of itching occurred in only 3 of 23 patients. Although some have considered a lack of itching characteristic of Norwegian scabies, pruritus is a frequent although not invariable complaint, especially among atypical presentations. Norwegian scabies should be strongly suspected in immunosuppressed patients with rash, regardless of itching.

In our series, the age of patients with Norwegian scabies ranged widely, from 3 months to 84 years. Camassa and others reported cases of Norwegian scabies in newborns receiving corticosteroids, and other series have included teenagers, adults, and elderly individuals. The most frequently affected ethnic groups in our series were the mestizos and Quechus, the high risk population for HTLV-I infection in Latin America. There was a predominance of female patients, which may reflect the higher rate of HTLV-I infection among women than men.

With regard to the pediatric cases of crusted scabies (5 of 23), one child whose mother was infected with HTLV-I, was also HTLV-I positive. Among the HTLV-I-negative children, one had growth retardation, with a low weight-for-age, two were chronically malnourished, including one with hypothyroidism, and one (three months old), had no underlying condition. Malnutrition has been reported as a major factor related to Norwegian scabies in children.

Two of our patients were receiving chronic corticosteroid therapy and one had Down’s syndrome; both of these conditions have been previously recognized as risk factors for Norwegian scabies. Another patient had large cell non-Hodgkin’s lymphoma associated with HTLV-I. Suzumiya and others reported the occurrence of Norwegian scabies in a patient with ATLL after diagnosis and treatment, and del Giudice and others reported six cases of Norwegian scabies in HTLV-I carriers, three of whom had ATLL upon diagnosis of crusted scabies. Four of 16 Norwegian scabies/HTLV-I co-infected patients had TSP. We have found only one previous report where both conditions were present.

Recently, Brites and others reported patients with Norwegian scabies in Bahia, Brazil who were infected with HTLV-I or co-infected with HTLV-I and HIV, although none had acquired immunodeficiency syndrome (AIDS). It is possible that in some of the previously reported cases of Norwegian scabies in patients with AIDS, an undetected concurrent infection with HTLV-I could have been present. In our hospital, patients with AIDS and Norwegian scabies are rarely found, although common scabies is frequently seen in AIDS patients.

The three patients who presented with repeated episodes of crusted scabies were asymptomatic HTLV-I carriers.

**Figure 1.** Multiple hyperkeratotic papules, some with crusting and erosion, in the axillary area and on the back. This figure appears in color at www.ajtmh.org.

**Figure 2.** Papules and vesicles in interdigital spaces extending toward the dorsum of the hand. This figure appears in color at www.ajtmh.org.
markably, the failure of the standard treatment against intestinal infection with *S. stercoralis* is now considered an important marker for HTLV-I screening. Similarly, the repeated episodes of Norwegian scabies among patients with HTLV-I infection could indicate a certain propensity of this group to relapse, suggesting a more subtle form of immunodeficiency associated with HTLV-I infection that merits further research.

During the follow-up period, 3 of 22 patients (two of whom were HTLV-I positive) died within a few days after diagnosis. Although the exact cause of death could not be ascertained, the presence of Norwegian scabies could indicate a risk factor for mortality. In the Ndiaye series in Dakar, 5 of 30 patients died before any specific condition was identified.

We conclude from this case series that it is important to consider the diagnosis of HTLV-I infection in patients with Norwegian scabies, especially in disease-settings or when there are no other apparent risk factors. This retroviral infection, rarely suspected, may also be associated with repeated episodes or intractable infestation by scabies mites, and death due to complicating bacterial infection.

Received September 15, 2004. Accepted for publication November 25, 2004.

Acknowledgments: We thank Dr. Joseph Vinetz (Division of Infectious Diseases, Department of Medicine, University of California at San Diego School of Medicine, La Jolla, CA) for critically reading the manuscript, Dr. Elsa González (Instituto de Medicina Tropical Alexander von Humboldt, Universidad Peruana Cayetano Heredia) for her support in preparing the manuscript, and to our health workers (Atilio Tello and Juana Huerta) for help in this study.

Financial support: This study was supported in part by the Directorate-General for Development Co-operation of the Belgian Government (DGDC – Framework Agreement 01).

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