A rare case of pruritic papular eruption of human immunodeficiency virus in a patient without a diagnosis of acquired immunodeficiency syndrome

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INTRODUCTION

Pruritic papular eruption (PPE) of HIV is a diffuse cutaneous eruption associated with low CD4+ T-cell count.[1] The primary lesions are erythematous papules that are typically symmetrically distributed on the extremities; the trunk and face are also commonly involved.[1,2] Lesions are extremely pruritic and patients often present with secondary changes including excoriations, fissures, erosions, lichenification, postinflammatory dyspigmentation, and nodules.[1,2] Serum analyses typically demonstrate absolute eosinophilia and elevated IgE, which may be indicative of a shift from Th1 to Th2 immunity.[1,3] Lower levels of IL2 (interleukin 2) and IFNγ (interferon gamma) in patients with PPE of HIV compared to HIV-positive patients without this dermatosis have also been reported and similarly suggest a shift away from Th1 immunity.[4]

CASE REPORT

A 60-year-old male with a history of HIV on highly active antiretroviral therapy (HAART) for the past 30 months was admitted to the inpatient unit for heart failure exacerbation, at which time HAART was held. Prior to admission, CD4+ count was 399 and viral load was undetectable. Upon admission, dermatology was consulted for diffuse pruritic eruption. According to the patient, the eruption had been present for approximately 6 months. Lesions began on the chest with eventual spread to the upper back, bilateral upper extremities, and bilateral thighs, with continued development of new lesions. He reported severe pruritus with excoriation of the lesions. He was using 0.1% triamcinolone ointment daily with mild improvement.

Abbreviations used:

HAART: highly active antiretroviral therapy
PPE: pruritic papular eruption

Dermatologic examination demonstrated hyperpigmented macules and papules of the chest, upper abdomen, flanks, bilateral upper extremities, and bilateral lower extremities (Fig 1, *A* and *B*). The proximal extremities were involved to a greater extent than the distal extremities. The lesions demonstrated an atypical morphology of central scar-like hypopigmentation. Examination also showed evidence of secondary changes due to persistent excoriation. Serum analyses drawn at admission demonstrated relative eosinophilia (5.4%) but a normal absolute eosinophil count (490 cells/uL). The CD4+ count was 230 and viral load was 84,405 copies/mL, potentially indicating resistance to HAART or decreased distribution due to

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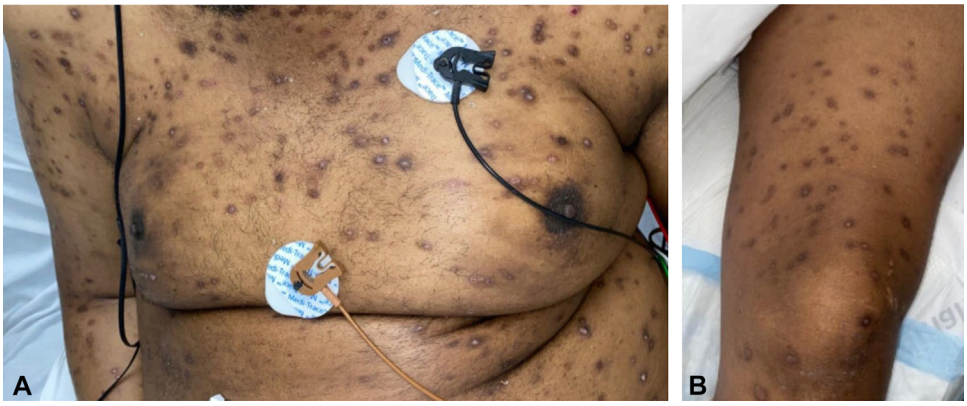

Fig 1. Dermatologic examination demonstrated hundreds of hyperpigmented macules and papules with central hypopigmentation on the chest (**A**), abdomen, upper back, upper extremities, and lower extremities (**B**).

heart failure with preserved ejection fraction. The differential diagnosis included scabies, although timeline and distribution were not consistent with scabies infestation. Immunosuppression-associated eosinophilic folliculitis was also considered.

A punch biopsy was performed, and histology revealed a superficial and deep perivascular infiltrate of lymphocytes with scattered eosinophils (Fig 2, *A* and *B*). Superimposed features of prurigo were noted. The findings were consistent with PPE of HIV; based on clinicopathologic correlation, the patient was diagnosed with PPE of HIV. Treatment with the patient's outpatient HAART regimen (50 mg bictegravir, 200 mg emtricitabine, and 25 mg tenofovir daily) was reinitiated. Triamcinolone ointment was continued twice daily for symptom control with plan to pursue systemic therapy as needed once outpatient.

DISCUSSION

PPE of HIV is classically described in patients with low CD4+ count, with one study reporting CD4+ count of less than 100 in 80% of patients (n = 41).[2,5] Increasing severity of PPE has been associated with decreasing CD4+ count. In a cross-sectional study of 102 patients with HIV, individuals were divided into mild, moderate, and severe PPE of HIV, with mild defined as fewer than 20 lesions, moderate defined as 20 to 60 lesions of the trunk and extremities with excoriation and dyspigmentation, and severe defined as high lesion density over a large body surface area including face, trunk, and all extremities.[1] The authors found a significant difference in CD4+ count between these cohorts. Within the severe cohort (n = 19), the median CD4+ count was 9 with an interquartile range of 2 to 79. Although our patient's clinical presentation fits within the severe PPE of HIV definition, his CD4+ count was 230. This is not only significantly higher than the median of the severe cohort, but also of the mild (CD4+ count 170) and moderate (CD4+ count 41) cohorts. This case, therefore, demonstrates that the association between CD4+ count and severity of PPE of HIV is not absolute.

Histopathology of PPE of HIV demonstrates an interstitial and perivascular lymphocytic infiltrate of the dermis with eosinophils.[2] Infiltration of CD8+ T cells within the dermis has also been reported.[6] Features consistent with persistent picking or scratching including hyperkeratosis are classically reported.[2] While some studies have noted perifollicular involvement, others have reported no follicular involvement.[1,7] In light of the findings on histopathology, it has been postulated that the pathophysiology underlying PPE of HIV is hypersensitivity reaction to an arthropod bite. In a cross-sectional study performed in Uganda, 84.3% of the 102 total patients had findings on pathology that supported this mechanism.[1] Fifty-three specimens demonstrated a wedge-shaped infiltrate and significant eosinophils; a central punctum of epidermal spongiosis overlying the dermal findings was observed in 11 of these patients.[1] Other factors that support the arthropod bite hypothesis include the geographic epidemiology of PPE of HIV and localization to the extremities.[2]

PPE of HIV is extremely rare within the United States, particularly in light of the introduction of HAART in the 1990s, and research into the treatment of PPE of HIV is lacking. First-line therapy of PPE of HIV is HAART; a prospective study of patients starting HAART demonstrated resolution of PPE of HIV in 86% of patients with follow-up (n = 43).[8,9] However, response to therapy was evaluated using a scoring system comprised of only 2 questions.[8] Treatment often involves targeting pruritus with topical corticosteroids, topical anti-pruritic therapy, and anti-histamines. Other suggested treatments

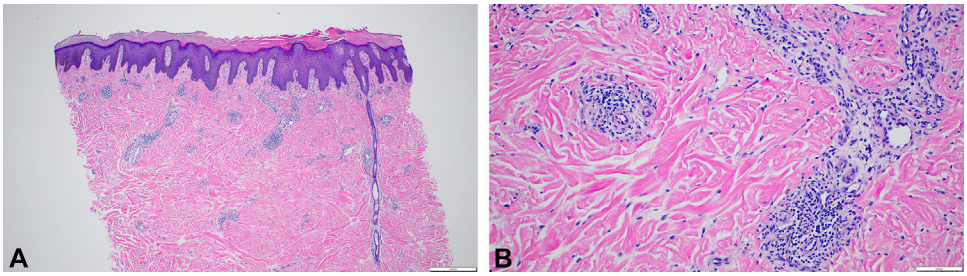

Fig 2. Histopathology demonstrated a superficial and deep perivascular infiltrate of lymphocytes with scattered eosinophils. (**A** and **B,** original magnifications: **A**, 40×; **B**, 200×).

include thalidomide, narrowband UVB (NB-UVB) phototherapy, and pentoxifylline.[9] A small prospective study (n = 8) demonstrated a decrease in lesion number and pruritus with NB-UVB phototherapy in all but one patient, with decreased CD2+, CD4+, and CD8+ cells on immunoperoxidase staining.[10] Pentoxifylline has also shown potential benefit in treatment of PPE of HIV; a study of 12 patients demonstrated significant reduction in the average degree of pruritus.[11] Unfortunately, large scale clinical trials into the management of PPE of HIV have not been pursued.

Here we present an unusual case of PPE of HIV in a patient residing in New York who did not meet criteria for AIDS. Further research is warranted to investigate potential factors other than CD4+ count that may be predictive of development and progression of PPE of HIV. Future directions should also include research into effective, evidence-based management of PPE of HIV.

Conflicts of interest

None disclosed.

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