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HTLV-I, Infective Dermatitis, and Tropical Spastic Paraparesis

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Abstract

Since human T-cell lymphotropic virus (HTLV-I) was identified in 1980 as causing human disease, it has been etiologically associated with adult T-cell lymphoma/leukemia (ATL) and tropical spastic paraparesis (TSP). More recently, several new diseases have been reported in association with this virus, including infective dermatitis of Jamaican children, which we reported in 1990.

Studies on infective dermatitis have shown that these children have abnormalities of immune function, and some develop other HTLV-I associated disorders, including TSP. This paper reviews the work done on infective dermatitis to date, and explores the association with TSP.

Index Entries: Infective dermatitis; HTLV-I; TSP/HAM; ATL; childhood infections.

Introduction

Human T-cell lymphotropic virus (HTLV-I) was the first retrovirus identified as causing clinical disease in humans. It was first isolated from cell lines from patients with Adult T-cell lymphoma/leukemia (ATL) by Poiez and coworkers in 1980 *(1)*. Since then HTLV-I has been shown to be etiologically associated with a chronic neurological disorder—tropical spastic paraparesis, or HTLV-I associated myelopathy (TSP/HAM) *(2,3)*. HTLV-I is endemic in Jamaica and the Caribbean and there is a relatively high incidence of both HTLV-I associated disorders, ATL and TSP/HAM *(4–6)*.

In 1990 we reported for the first time the association between HTLV-I and infective dermatitis of Jamaican children. This is a unique pattern of dermatitis/eczema seen in Jamaican children and described as a clinical entity by Sweet and Walshe in 1966 *(7,8)*. It is characterized by a severe exudative eczema of the scalp, neck, external ears and behind the ears, axillae, and groin, a generalized fine papular rash, a watery nasal discharge or crusting of the anterior nares, the invariable culture of B hemolytic streptococcus and/or staphylococcus from nasal or skin swabs from these patients, and the need for long-term antibiotic therapy for satisfactory control of the dermatitis.

In a pilot study in 1990 all 14 children with a diagnosis of infective dermatitis were seropositive for HTLV-I antibodies *(9)*. This association was later confirmed in a case control study of 50 infective

dermatitis patients and 36 atopic eczema patients *(10)*. The average age of onset was 2 yr. Since none of the patients had a history of blood transfusions and were presumed too young for transmission by sexual intercourse, we assume the mode of transmission to be maternal/infant. We postulate that HTLV-I infection causes an alteration in the immune response of these children resulting in chronic bacterial infection. The eczema is thought to be an allergic-type reaction to some component or product of the bacteria, hence the need for long term antibiotics to control the chronic dermatitis. Alteration in the immune function of infective dermatitis patients was also confirmed in the case control study. The abnormalities included elevation in total lymphocyte counts, increased numbers of activated T-cells, and an increased T4/T8 ratio. There were also significantly higher levels of all classes of immunoglobulins in infective dermatitis patients than in controls.

Much more work remains to be done to try to identify the exact immunological mechanisms involved. Further work needs to be done, for example, on the epidermal cells of these patients, particularly the Langerhans cells, on the cells comprising the infiltrate in the dermatitis, the cytokines produced by these cells, and their interaction with other cells.

What of the prognosis of these children? Do they develop other HTLV-I associated disorders? In an effort to provide clues to the answers to these questions we did a retrospective study *(11)*. Of 81 patients with infective dermatitis followed at the dermatology clinic, University Hospital of the West Indies (UHWI) between 1970–1990, 30% developed complications, including scabies, corneal opacities, TSP/HAM, and lymphocytic interstitial pneumonitis. In addition, three patients with infective dermatitis died, one of definite ATL *(12)*, and two of ATL-like syndromes.

The three patients with TSP were all female, aged 14, 28, and 33. They had each had infective dermatitis diagnosed for 10, 15, and 24 yr respectively. The youngest patient also had severe chronic bronchiectasis and severe growth retardation with delayed puberty. They all had normal myelograms and elevated CSF lymphocyte counts.

The mean age of onset of TSP/HAM is in the 40–49 age group, and TSP/HAM is thought to result from HTLV-I infection acquired during adulthood. Thus, patients with infective dermatitis may define a special subgroup of patients who develop TSP/HAM at an earlier age, having acquired the infection very early in life. Further study on these patients would be most interesting since it is not known at present why some patients develop ATL and others TSP/HAM. Occurrence of both ATL and TSP/HAM in the same patient is rare.

In infective dermatitis we appear to have a cohort of children who have acquired the infection at the same time but develop different HTLV-I associated disorders. Clearly, factors other than age at time of initial infection and duration of infection must be operative. Thus, the discovery of new HTLV-I associated disorders provides new perspectives and insights into the well established diseases like TSP, thereby expanding research horizons.

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