Peptide-T in the Treatment of Psoriasis and Psoriatic Arthritis

A Case Report

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The following is a description of the improvement of a HIV-negative patient with psoriasis and monoarthritis who received treatment with Peptide-T, a synthetic octapeptide that shares a segment of the envelope glycoprotein (gp 120) of the human immunodeficiency virus. (Accepted May 31, 1988.)

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Peptide-T is a synthetic octapeptide that is identical with a segment of the envelope glycoprotein (gp 120) of human immunodeficiency virus (HIV) (1). This particular segment is essential for the attachment of the virus to the CD4 receptor of the T-cell (2).

A clinical trial has recently been reported using Peptide-T on AIDS patients (3). One individual who suffered from severe psoriasis in addition to AIDS found that the skin disease cleared completely (4). In order to rule out whether this was a secondary effect due to the improvement of AIDS or a direct effect on the psoriasis process itself, we decided to try Peptide-T on a patient with severe plaque type of psoriasis.

CASE REPORT

A 60-year-old married man without family history of psoriasis and joint disease. Moderate psoriasis confined to the dorsa of hands and fingers for many years. Recently, it became recalcitrant and widespread, covering a large area of the body surface. He received topical therapy consisting of Dithranol and steroids, with limited success. Five weeks prior to Peptide-T, he was on PUVA and showed only slight improvement. Before Peptide-T was administered, therapy was withheld for 10 days except for indifferent emollients. Upon admission, examination revealed thick infiltrated plaques on the dorsa of hands, on the trunk and legs. The distal interphalangeal joint of the left fourth finger was palpated swollen and tender.

Course

1 mg Peptide-T was given intravenously b.i.d. for 28 days. No side effects were noted. Response of the skin lesions was observed after 2 weeks, showing diminishing erythema and scaling. Thereafter a gradual thinning of the plaques occurred. Ultimately his hands, arms and trunk were almost cleared, in contrast to his lower legs (Fig. 1 *a, b*). An amelioration of his monoarthritis was registered with regard to subjective pain and tenderness on palpation. Although his psoriasis was not fully cleared, the progress of the disease had definitely been halted. The therapeutic effect lasted for 30 days. An intradermal PPD test 3 weeks after the last infusion showed a strong positive response.

Laboratory investigations

ESR 1, Hemoglobulin 128, WBC, liver function test normal before and after treatment. Gamma-glutamuryl transferase was elevated due to alcohol abuse. Lymphocyte subpopulations, see Table I. HIV serology was negative.

DISCUSSION

The central nervous and immune systems share the specific cell surface molecule CD4 (1). Its distribution in the human brain shows that there is a dense accumulation in the hippocam-

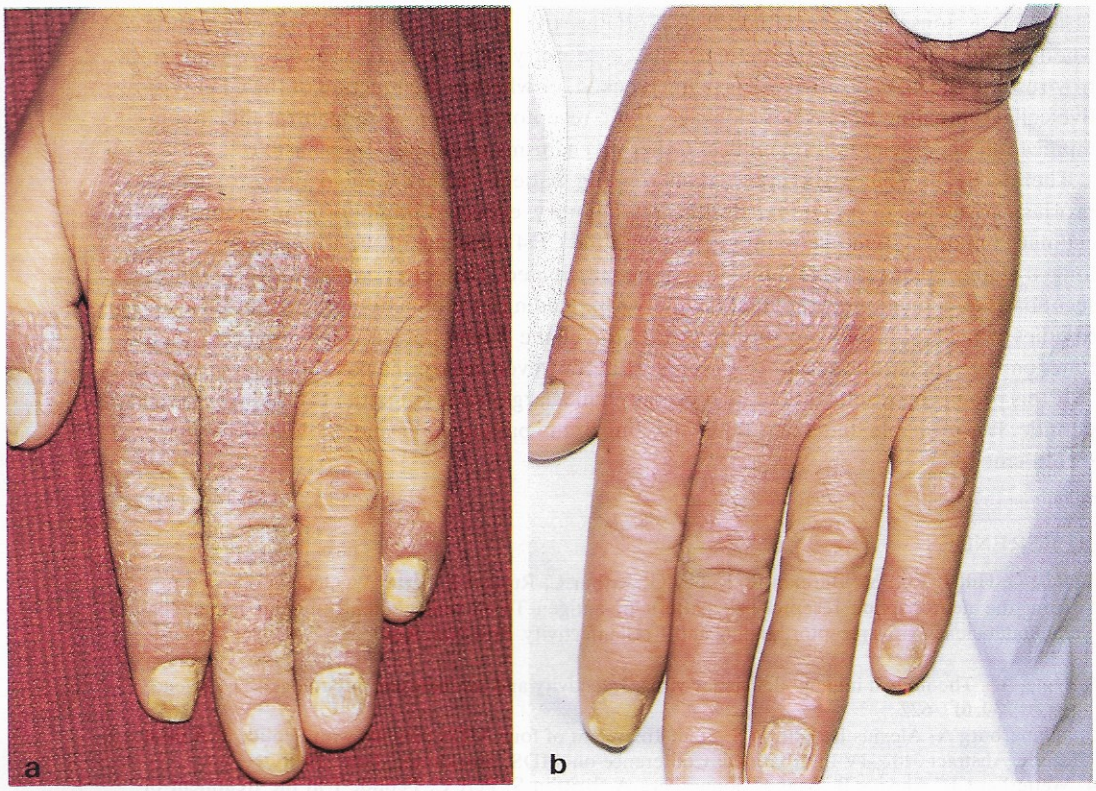

Fig. 1 a, b. Left hand before (*a*) and after (*b*) Peptide-T treatment.

pal region (1). This recognition molecule is modulated by a neuropeptide, vasoactive intestinal peptide (VIP) (5). It is not known whether VIP or other neuropeptides are important in psoriasis. The T-helper cells, Langerhans' cells and monocytes also carry the CD4 molecule (6), cell types which are present in psoriatic skin lesions (7). It serves as the attachment structure for the immunodeficiency virus (HIV) by which the CD4-bearing cells become infected (2). Both HIV and VIP compete for binding to the CD4 receptor (5).

Both the patient's skin lesions and his arthritis improved after the treatment. The fact that he did not heal completely could be due to his alcoholism. Alternatively, the dose given might have been to low, or given for too short a time period.

The mechanisms underlying the effect can only be speculated upon. A viral etiology of psoriasis has been suggested, since retrovirus-like particles have been identified in

Table I. *Lymphocyte populations before and after Peptide-T treatment*

T-cell marker	No. ($\times 10^9$/l) Day 0	Day 28
Oct. 3	1.07	0.87
Oct. 4	0.56	0.54
Oct. 8	0.59	0.42
Oct. 4/8	0.95	1.29

cutaneous lesions, urine and blood of psoriatics (8). It is at present an open question whether the outcome for the patient is because entry of a putative psoriasis-causing retrovirus into the CD4 positive cell is being blocked, or whether the function of the CD4-positive cells is impaired because of blockage of the receptor, thus preventing intracellular communication via crucial neuropeptides. Other mechanisms might also be plausible.

There may be some risk involved in treating patients with a benign disease such as psoriasis by means of a peptide. Besides a temporary, expected immunosuppression of the cellular immune system due to interaction with the CD4 molecule of the T-helper cell, a prolonged state of depressed immunity might be anticipated. This latter consequence would be secondary to activation of the idiotypic network, leading to production of anti-idiotypic antibodies which could bind to the CD4 receptor of the T-lymphocyte, thus impairing their function (9). The strong response towards PPD, however, make this possibility less likely.

If this promising result were to be reproduced in a larger series of patients treated with the peptide, it is probable that a new understanding of the pathogenesis and etiology of psoriasis would emerge.

REFERENCES

1. Pert C, Hill J, Ruff M, Berman R, Robey G, Arthur L, Ruscett F, Farrar W. Octapeptide deduced from the neuropeptide receptor-like pattern of antigen T4 in brain potently inhibit human immunodeficiency virus receptor binding and T-cell infectivity. Proc Natl Acad Sci USA 1986; 83: 9254–9258.
2. Fauci AS. The human immunodeficiency virus. Infectivity and mechanisms of pathogenesis. Science 1988; 239: 617–622.
3. Sönnerborg A, Alexius B, Britton S, et al. Treatment of four AIDS patients with Peptide T: A pilot study. Abstract 3102, IV International Conference on AIDS, Stockholm, June, 1988.
4. Wetterberg L, Alexius B, Sääf J, Sönnerberg A, Britton S, Pert C. Peptide-T in the treatment of AIDS. Lancet 1987; 159.
5. Pert C, Smith CC, Ruff MR, Hill JM. Aids and its dementia as neuropeptide disorder. Role of VIP-receptor for blockade by human immunodeficiency virus (HIV) envelope. Ann Neurol 1988 [in press].
6. Wood GS, Warner NL, Warnke RA. Anti-Leu 3/T4 antibodies react with cells of monocyte/macrophage and Langerhans lineage. J Immunol 1983; 131: 212–216.
7. Jablonska S, Glinski W. Overview of Immunology. In: Roenigk H, Maibach H, eds. Psoriasis New York: Marcell Dekker, 1985; 189.
8. Iversen OJ, Dalen AB. The major internal protein, p27, of a retrovirus like particle is expressed in blood lymphocyte from a psoriatic patients. Arch Virol 1985; 85: 197–207.
9. Burdette S, Schwartz RT. Idiotypes and idiotypic networks. New Engl J Med 1987; 17: 219–223.