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Plasma Neuropeptide Levels in Psoriasis

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The immune system is important in the pathogenesis of psoriasis and emotional stress has precipitated psoriasis in many patients. Neuropeptides, alpha-Melanocyte stimulating hormone (alpha-MSH), beta-endorphin, met-enkephalin and substance P (SP) act as immunomodulators, and their secretion increases during periods of stress. To see whether these neuropeptides themselves might be related to psoriasis and/or to the aggressiveness of the disease, we evaluated the plasma neuropeptide levels in 13 patients with active psoriasis (patients with new lesions and/or pre-existing lesions that had become larger during the month before the study), in 11 patients with stable psoriasis and in 10 healthy controls. Plasma concentrations of neuropeptides were evaluated by RIA (immunoradiometric assay for beta-endorphin). Data were compared by the Student *t*-test for unpaired data. There were no significant differences between the plasma levels of any of the neuropeptides between active psoriatic patients and stable psoriatic patients, nor between the plasma levels of neuropeptides of psoriatic patients and those of control subjects. It seems unlikely that circulating neuropeptide levels are of primary importance in the manifestation of the psoriatic skin lesions. *Key words:* psoriasis; opioid peptides; substance P.

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The immune system is important in the pathogenesis of psoriasis (1) and emotional stress has precipitated psoriasis in many patients (2). Opioid peptides (i.e., alpha-Melanocyte Stimulating Hormone (alpha-MSH), beta-endorphin and met-enkephalin) are important regulators in the immune system, including T cell functions (3). Their release has also been shown to be affected by stress (4). Stress also influences the immune response and it has been suggested that opioid peptides might be mediators in stress-induced immunomodulation (5). Substance P (SP), a neuropeptide present in both central and peripheral nervous systems, is known to have some important physiological functions, including T cell immunomodulation (6). In addition, SP secretion is also influenced by stress (7). It has been suggested that the nervous system can influence the course of psoriasis and that neuropeptides, such as SP, may be of importance in the pathogenesis of psoriasis (2, 8). This hypothesis is supported by the observation that the treatment of psoriasis with topical capsaicin, which depletes primary-sensory nerves of neuropeptides, can improve psoriasis (9). Thus, opioid peptides and SP seem to have two important biologic characteristics in common: they act as immunomodulators and their secretions vary during periods of physical and/or psychological stress. For these reasons, the changing levels of opioids and neuropeptides might be correlated with the manifestations of psoriasis.

To see whether or not the levels of these peptides might be related to psoriasis itself and/or to the aggressiveness of the disease, we measured the plasma peptide levels in patients with active psoriasis, in patients with stable psoriasis and in healthy subjects.

PATIENTS AND METHODS

Twenty-four male patients (32 to 50 years) with extensive plaque-form psoriasis (mean PASI score 18) were studied. In 13 of the 24 patients, new lesions had developed and/or pre-existing lesions had enlarged during the month before the study. These patients were defined as having active psoriasis; the other 11 as stable. The control group consisted of 10 male healthy volunteers (30 to 46 years). Samples of peripheral blood were taken at 8 a.m. Plasma concentrations of neuropeptides were evaluated by RIA (Immunoradiometric assay (IRMA) for beta-endorphin) with ^{125}I-labelled specific rabbit antibodies and different types of bound-free separation. For met-enkaphalin, preliminary extraction of the sample on Sep-pack C18 silica columns (Waters Associated, Milford, Mass) was necessary. In the assays, the reagents

Table I. *Plasma concentration of opioid peptides and substance P in patients with psoriasis, compared with healthy subjects**

Peptide	active psoriasis (13 cases)	stable psoriasis (11 cases)	healthy subjects (10 cases)	*p*-values			
				Active P. vs. healthy subjects	Stable P. vs. healthy subjects	Active P. vs stable P.	Active plus stable P. vs. healthy subjects
Alpha-MSH	62.5+4.9	65.3+7.2	57.7+8.2	NS	NS	NS	NS
Beta-endorphin	26.0+1.3	23.2+1.0	24.3+1.6	NS	NS	NS	NS
Met-enkephalin	55.8+5.8	53.9+6.4	52.5+8.9	NS	NS	NS	NS
Substance P	32.8+4.7	39.4+4.2	38.4+3.3	NS	NS	NS	NS

* Plasma peptide levels are expressed in pg/ml (mean + SEM) NS, no significant difference (Student's *t*-test).
P psoriasis.

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used were from Immuno Nuclear Corporation, Stillwater, Minn, for alpha-MSH, met-enkaphalin and substance P; Allegra-IRMA from Nichols Institute Diagnostic, S Juan Capistrano, Cal., for beta-endorphin. The data were analysed by Student's *t*-test for unpaired data.

RESULTS

The results of neuropeptide plasma levels (mean + SEM) are given in Table I. There were no significant differences in the plasma levels of any neuropeptide between any two groups.

DISCUSSION

No previous study of plasma levels of opioid peptides in psoriasis has been made. Our data for SP accord with those of Eedy et al. (10), who found no differences in the plasma levels of SP between psoriatic patients and controls. In the present study the plasma levels of opioid peptides and of SP in psoriatic patients did not differ from those of normal subjects, and there was no correlation between the plasma levels of any neuropeptide and the aggressiveness of the disease. Since all of our patients had extensive psoriasis, it seems unlikely that circulating opioid peptides or SP are of primary importance in the manifestation of the psoriatic skin lesions.

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