Generalized Punctate Leukoderma Following UVB Phototherapy in the Psoriasis Patients

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Four patients with psoriasis developed numerous punctate hypopigmented macules over the whole body during phototherapy. This generalized punctate leukoderma is different from the vitiligo which follows PUVA therapy and from idiopathic guttate hypomelanosis. Compared to vitiligo and idiopathic guttate hypomelanosis, the depigmented macules of punctate leukoderma are smaller in size and larger in number. Cumulative UVB phototoxicity toward melanocytes is the most likely cause of this leukoderma.(Ann Dermatol 2:(2) 93-95, 1990)

Key Words: Generalized punctate leukoderma, Psoriasis, UVB

UVB phototherapy[1] and PUVA are well recognized therapies for treating psoriasis. However, there are some pigmentary side effects, such as "PUVA freckle" and vitiliginous patches which occur following PUVA therapy.[2,3] Recently, the appearance of punctate hypopigmented and achromic spots, the so called, "Leukoderma Punctata[4]" following treatment with PUVASOL,[5] has been reported.

We report our cases to call attention to the fact that punctate leukoderma, a rare pigmentary side effect, can occur after phototherapy.

REPORT OF CASES

We have noted four cases of generalized punctate leukoderma after UVB phototherapy of chronic resistant psoriasis patients. The minimal erythemal doses for the patients were within normal limits (30-50 mJ/cm^2). We treated them with UVB phototherapy 3 times a week and the numerous hypopigmented and achromic spots developed on the entire body (Fig. 1). The lesions were well demarcated macules measuring from 0.5 to 1.5mm in diameter. The number of treatments and total accumulative doses of UVB are presented in Table 1.

Skin biopsies were taken from the hypopigmented macules of all four patients. There were no specific findings in the hematoxylin-eosin stained sections, however a focal melanin reduction was noted in the Fontana-Masson stained sections in all 4 cases (Fig. 2). On electron microscopic examination, there was vacuolar degeneration of cytoplasm and loss of cellular organelles in the melanocytes (Fig. 3).

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DISCUSSION

PUVA and UVB phototherapy are, at present, common therapeutic modalities for psoriasis. However, some pigmentary side effects after PUVA

Table 1. UVB phototherapy in the psoriasis patients

Case	Sex/Age	Duration of psoriasis (years)	MED (mJ/cm²)	Starting dose (mJ/cm²)	No. of treatment	Total accumulative dose (mJ/cm²)
1	F/26	7	40	30	14	2391
2	F/20	7	30	60	51	11567
3	F/24	10	50	50	57	14322
4	F/33	1	40	120	51	5557

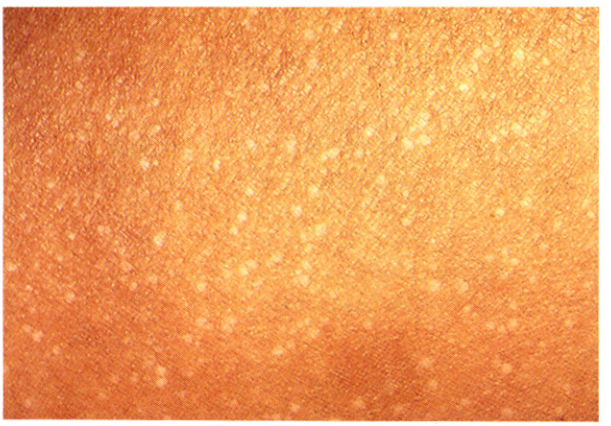

Fig. 1. Numerous, well demarcated, hypopigmented and achromic spots on the back.

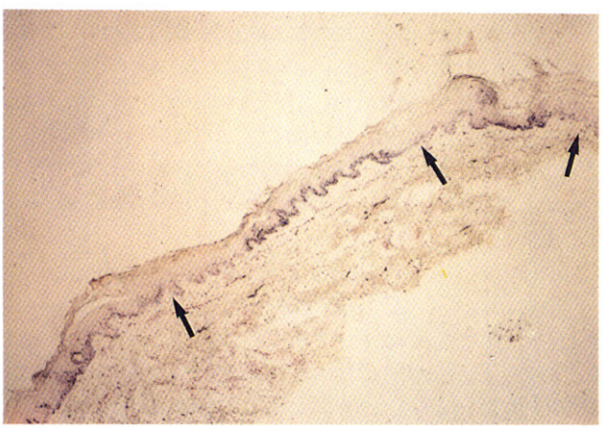

Fig. 2. Light microscopic examination of a section of hypopigmented macule shows (arrows) a focal melanin reduction (Fontana-Masson stain; ×100).

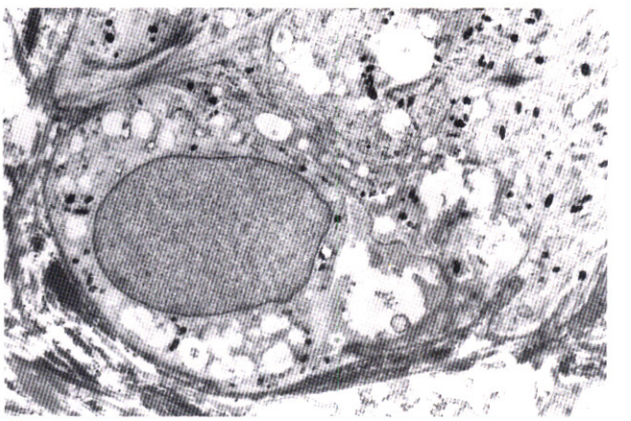

Fig. 3. Electron microscopic examination of a section from a hypopigmented macule shows vacuolar degeneration of the cytoplasm and a loss of cellular organelles of the melanocytes (×7,200).

treatment have been reported. Kanerva et al.[2] noticed that persistent ashen-gray macules and freckles developed after prolonged PUVA therapy of psoriasis. Tegner[6] found several cases of hypopigmentation among his PUVA-treated patients. Todes-Tayer et al.[3] reported 3 cases of vitiligo, two in patients with psoriasis and one in a patient with mycosis fungoides after PUVA therapy. Park et al.[7] reported vitiliginous hypopigmented patches in a patient with psoriasis during PUVA therapy.

"Leukoderma Punctata", which was first reported by Falabella et al.[4] in 1988, is a peculiar disorder with punctate hypopigmented and achromic spots and is different from vitiligo or idiopathic guttate hypomelanosis. It appeared after treatment with PUVASOL, which is a treatment of sun exposure 2 hours after oral ingestion of psoralen. However, there have been no reports of punctate leukoderma after UVB phototherapy.

Our four patients with psoriasis developed generalized punctate leukoderma after UVB phototherapy. The lesions were well demarcated hypopigmented and achromic spots. Histopathologically, focal diminution of melanin was found in the depigmented macules using the Fontana-Masson stain. Ultrastructural studies showed damage of melanocytes consisting of vacuolar degeneration and loss of cellular organelles. Also, there was vacuolar degeneration in the ker-

atinoytes. These findings are similar to those described by Falabella et al.[4] who found intracellular edema and vacuolar degeneration of melanocytes and keratinocytes.

Punctate leukoderma is different from vitiligo following PUVA therapy and idiopathic guttate hypomelanosis.[8] The depigmented macules of punctate leukodema are smaller in size and larger in number than those of vitiligo or idiopathic guttate hypomelanosis.[9] Moreover, idiopathic guttate hypomelanosis is common with advancing age. Histopathologically, absence of melanocytes and melanin granules is commonly observed in vitiligo, while just reduction of melanin pigment in depigmented lesion is found in punctate leukoderma and idiopathic guttate hypomelanosis. Ultrastructural studies in idiopathic guttate hypomelanosis have not shown vacuolar degeneration in melanoytes as seen in our patients.

The harmful effects of photochemotherapy have been reported. Nordlund et al.[10] found that pigmentary cells of mice are susceptible to ultraviolet injury and killed by large doses of PUVA. Pathak et al.[11] reported that PUVA produced deoxyribonucleic acid psoralen photoadducts in mammalian skin, indicating nuclear damage of both keratinocytes and melanocytes.

Our four patients with psoriasis, resistant to therapy were treated with UVB for the long time. Thus, we postulate that the most likely cause of leukoderma in these patients is the cumulative UVB phototoxicity toward melanocytes.

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