

## Treatment of Psoriasis Vulgaris with Narrow-band UVB and Topical Maxacalcitol

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Sir,

Narrow-band ultraviolet B (nUVB) phototherapy is one of the most effective treatment modalities for patients with psoriasis, offering an excellent short-term benefit/risk ratio. However, its long-term adverse effects have not been thoroughly assessed. Therefore, photocombination therapies that combine UVB therapy with other treatment modalities are important and of high interest, not only to improve efficacy, but to reduce the cumulative UVB dose (1, 2). In particular, a combination of UVB with topical vitamin D analogues is considered to be a beneficial treatment regimen for psoriasis (3). On the other hand, the superiority of this combination therapy to nUVB monotherapy has not been fully established; some reports have shown increased therapeutic efficacy (4–6) while another report has shown no significant difference in effectiveness (7). Maxacalcitol is a newly synthesized, active vitamin D3 analogue (8) used clinically for the treatment of psoriasis in Japan. In this study, we examined whether the combination of maxacalcitol and narrow-band UVB is superior to nUVB monotherapy for psoriasis vulgaris treatment.

### MATERIALS AND METHODS

Our study included 26 patients with widespread symmetrical psoriasis who were admitted to the University of Tokyo Hospital from September 2002 to March 2004. Narrow-band UVB (311 nm) irradiation of the entire body was performed using 20 Philips TL-01/100 fluorescent bulbs mounted in a UV7001K cabin (Waldmann, Villingen-Schwenningen, Germany). The initial UVB dose was 0.1 J/cm<sup>2</sup>, and the dose was gradually increased in increments of 0.1 J/cm<sup>2</sup> until slight erythema was observed, when the dose was maintained. Irradiation was performed 5 times a week for 4 weeks. Treatment with maxacalcitol ointment (0.0025%) (Oxarol<sup>®</sup> ointment, Chugai Pharmaceutical, Tokyo and Maruho, Osaka, Japan) was performed daily. We also set a control area treated with white petrolatum instead of maxacalcitol. For comparison between the control area and the contralateral area treated with maxacalcitol, the Psoriasis Severity Index (PSI) score was calculated as the sum of the scores for erythema, scaling and induration (8). In 15 patients, the control area was extended to the left body-half (i.e. half-side test), and the Psoriasis Area and Severity Index (PASI) score (excluding the head score) was determined for each body-half. Furthermore, in each area selected for PSI analysis, we evaluated the extent of pigmentation with a reflectance spectrophotometer (Mexameter<sup>®</sup>; Courage + Khazaka Electronic GmbH, Germany). Wilcoxon-signed rank sum test was used for statistical analysis.

### RESULTS

The treatment was well tolerated with no serious adverse effects. The mean cumulative UVB dose was

19.3 ± 6.8 J/cm<sup>2</sup> (range 10.0–32.1 J/cm<sup>2</sup>). The mean PASI score among the 26 patients before treatment was 16.7 ± 9.4 (SE), and it decreased to 2.4 ± 2.9 after 4 weeks of photocombination therapy with maxacalcitol ointment. The mean PSI score of the area treated with nUVB plus topical maxacalcitol decreased from 5.9 ± 1.3 to 0.88 ± 0.95 after 4 weeks, while that of the contralateral area treated with nUVB alone decreased to 1.28 ± 1.48. There was already a significant difference at 1 and 2 weeks in the PSI score between them (data not shown). Among the 15 patients in the half-side test, the mean half-side PASI score of the side treated with photocombination therapy decreased from 15.3 ± 9.2 to 2.0 ± 2.1 at 4 weeks, while that of the side treated with monotherapy decreased to 2.9 ± 2.3. A significant difference in the half-side PASI score was observed at 2, 3 and 4 weeks (Fig. 1). Analysis using Mexameter<sup>®</sup> apparatus showed that after 4 weeks of treatment, the extent of pigmentation (tanning value) increased from 142.3 ± 45.7 to 363.4 ± 88 in the photocombination therapy area, while it increased from 137.0 ± 49.7 to 350.9 ± 94.1 in the nUVB monotherapy area. There was no significant difference in the tanning rate between these two regimens at any time during the treatment course.

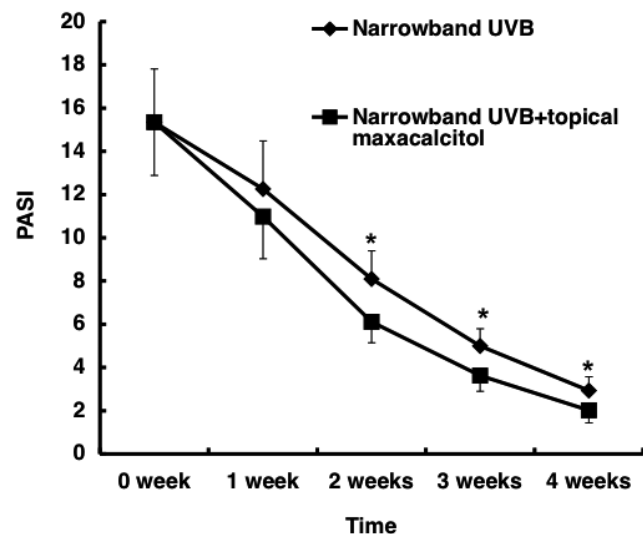


Fig. 1. Changes in the Psoriasis Area and Severity Index (PASI) scores over the course of therapy in the 15 patients. The PASI score of the skin areas treated with photocombination UVB therapy using maxacalcitol was significantly lower than that of skin areas treated with narrow-band UVB monotherapy at 2, 3 and 4 weeks. Error bars represents the standard error of the mean. \* $p < 0.05$ .

## DISCUSSION

Our result is in agreement with the results of recent studies (4, 5) which showed a faster reduction in the PASI score in the group treated with nUVB plus topical calcipotriol than in the group treated with nUVB alone, but these reports found no differences in the PASI score at the end of treatment. We propose several reasons for the superiority of photocombination therapy in our study in which the PASI score showed a statistically significant difference even at the late stage of treatment. First, the overall UVB dose was relatively small, and in our half-side test regimen, the UVB dose was the same for each pair of results. This situation differed from those in previous studies in which the UVB dose was sometimes increased when the clinical efficacy was not sufficient, and thus in the present study the effect of maxacalcitol was not overshadowed by the effect of the nUVB irradiation. Secondly, the clinical efficacy of topical maxacalcitol might be more potent than that of calcipotriol or other vitamin D analogues, especially when used in combination with nUVB irradiation. Our study also showed no significant difference in the intensity of pigmentation between plaques treated with photocombination therapy and those treated with nUVB monotherapy. This indicates that the hyperpigmentation seen in photocombination therapy may be due mostly to nUVB irradiation itself (9) and may not be further accelerated by topical maxacalcitol, at least in our treatment protocol and in the Asian skin type.

In summary, our study clearly indicated that photocombination therapy with topical maxacalcitol improved the efficacy of nUVB therapy without accelerating pigmentation. This photocombination therapy should be explored further in an effort to minimize the cumulative dose of nUVB irradiation.

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