

Nonlaser UVB-Targeted Phototherapy Treatment of Psoriasis

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Nonlaser localized narrowband (290–315 nm) UVB phototherapy was tested in 10 subjects with localized psoriasis. Treatments were given 2 to 3 times weekly. Four patients did not complete the planned 25-treatment course. Of the remaining 6 patients, all reached greater than 90% clearing of their disease. Localized nonlaser UVB phototherapy is another option for the treatment of localized psoriasis.

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Phototherapy is one of the safest and most effective treatments for psoriasis. Traditional UV phototherapy usually involves nearly full-body exposure to UV light. The maximum UVB dose that can be safely delivered during any single treatment session is limited to the minimal erythematous dose (MED) for uninvolved skin. Twenty-five to 30 treatment sessions or more may be required to produce greater than 90% clearing of psoriatic plaques.

Narrowband UVB is more effective than broadband UVB.^{1,2} Additionally, psoriatic skin is able to withstand higher doses of UVB than uninvolved skin.³ If multiples of a patient's MED on normal skin are used directly on the psoriasis plaques, it is possible to bring psoriatic plaques

into remission in fewer treatment sessions than would be required using traditional full-body UV light cabinets.

Development of the UVB (308 nm) excimer laser made it more feasible to deliver high doses of UVB selectively to psoriatic plaques. The localized monochromatic UVB laser (308 nm) is effective for plaque clearance.³⁻⁵ In this study, we tested a noncoherent UVB targeted phototherapy system on psoriatic plaques.

Materials and Methods

The targeted phototherapy system used was the DualLight™ Model UV120-2 UVA/UVB Phototherapy System. This device emits either UVA or UVB bands of light. This system is compact, weighs less than 20 lbs, and emits UV light through a flexible light guide to a 3/4-in square-sided handpiece. Only UVB procedures were performed during the study; targeted psoralen plus UVA was not used. UVB emitted by the device is contained within a narrow spectrum of 290 to 315 nm, with peaks at 302 and 312 nm. The mean weighted erythematous wavelength of UVB is 304 nm.

Ten adults diagnosed with psoriasis participated in this study. They were evaluated and treated in the Wake Forest University Dermatology Clinic. Subjects received targeted UVB treatments 2 to 3 times weekly; subjects were considered treatment failures if they completed 25 treatments without improvement. If improvement did occur, additional treatments were permitted. No other treatment was used during the study except for mineral oil, which was applied immediately prior to UVB treatment.

Treatments were performed by placing the handpiece tip on a section of the targeted plaque and depressing a foot switch. A typical dose, which was equivalent to 3 to 7 times a subject's MED, was

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Subject Baseline Characteristics and Treatment Variables*†

	Subjects (N=6)					
	M	M	M	M	M	M
Sex						
Age, y	63	69	43	49	34	72
Pre-PASI score						
Scaliness	1	1	1	1	2	1
Erythema	1	1	1	1	1	1
Induration	2	2	1	1	1	1
Total	4	4	3	3	4	3
Post-PASI score						
Scaliness	1	1	1	0	0	0
Erythema	1	1	0	1	1	1
Induration	0	0	0	0	0	0
Total	2	2	1	1	1	1
MED dose, mJ/cm ²	21	18	18	12	18	15
	0	0	0	0	0	0
Starting dose, mJ/cm ²	12	54	12	72	10	75
	60	0	60	0	80	0
Total treatments	14	33	23	28	22	12

*Of the 10 subjects enrolled in the study, 6 subjects completed the study.

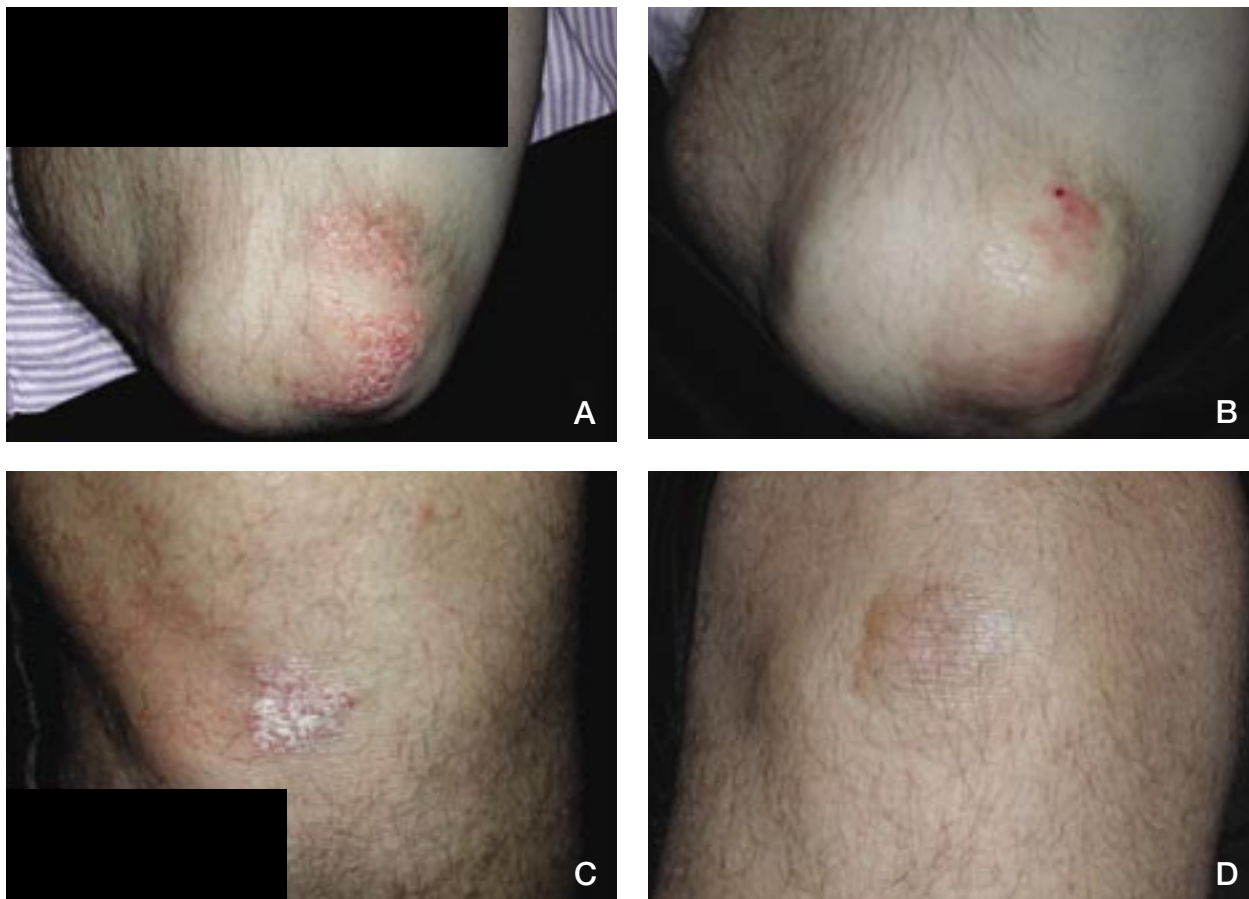
†M indicates male; PASI, Psoriasis Area and Severity Index; MED, minimal erythema dose.

delivered in several seconds. The handpiece was moved from one plaque segment to another until the entire plaque was treated. A typical elbow or knee can be treated within several minutes.

At baseline evaluation, a brief medical history and psoriasis treatment history were taken. Psoriasis severity was assessed with the Psoriasis Area and Severity Index at baseline and at the end of the study. Photographs were taken of the subject's psoriatic areas pretreatment and posttreatment. Occasionally, weekly pictures also were taken. At baseline, the subject's MED was determined using a series of increasing UVB doses that were preprogrammed into the phototherapy device. The skin test sites were examined 24 hours later to determine the MED for that subject. From this, the subject was treated per protocol 2 to 3 times weekly using multiples (3–7 times) of the subject's MED until greater than 90% clearance was observed.

In general, because we had no prior experience using this phototherapy system, we employed a relatively conservative plaque dosing strategy. If the lesion did not respond visually (no flattening, tanning, or reduction of scale) and/or there was no evidence of erythema after the first treatment, the dose was increased by one MED. We continued to increase by one MED on subsequent treatments if no response was indicated. If the lesion still showed no response after 3 treatments at the increased dose levels, treatment was halted; the subject was then considered a partial clearing or nonresponder and exited from the study.

A follow-up period ensued after the last treatment to assess duration of remission. Subjects whose lesions cleared returned at 2, 4, and 6 months after clearing. If the lesion exhibited any recurrence, subsequent follow-up evaluation was not required.



Representative psoriatic plaques on an elbow at baseline (A) and after 14 UVB treatments over 7 weeks (B) and on a knee at baseline (C) and after 22 UVB treatments over 8 weeks (D).

Results

All subjects enrolled in the study were white men (age range, 34–72 years). Four of 10 subjects dropped out during treatment due to scheduling conflicts, relocation, and unknown reasons. Of the remaining 6 subjects, all reached greater than 90% clearing of their disease. The number of treatments ranged from 14 to 33. The Table lists baseline characteristics and treatment variables for the 6 subjects who completed the study. One subject failed to return for follow-up. At each follow-up interval, recurrence data were recorded for the target lesion. Of the 5 remaining subjects, one subject showed recurrence by 2 months, 3 subjects showed recurrence by 6 months, and one subject showed no recurrence at the 6-month follow-up visit. The Figure shows the clinical appearance of representative psoriatic plaques at baseline and posttreatment.

Comment

A potential alternate treatment methodology for rapid plaque clearance is narrowband UVB up

to 5 times weekly instead of 2 to 3 times weekly. However, treatments 5 times weekly do not offer substantial benefit over treatments 3 times weekly.⁶ In addition, for patients with isolated plaques, exposure of uninvolved skin to UV light is undesirable.

The recurrence rates in our subjects were similar to those reported for the excimer laser in which plaques treated with fluences under 8 MEDs frequently recurred within 4 months.^{3,4} Remission periods for nontargeted UVB and psoralen plus UVA vary widely and range from 1 month to 1 year or more.⁷ For targeted phototherapy, either higher fluences (eg, 8 MEDs) or a maintenance protocol similar to that reported for the excimer laser may be of benefit.⁸

Localized noncoherent UVB phototherapy appears to be an effective and well-tolerated treatment for psoriasis. The lack of symptomatic erythema (burning or blistering) in this study suggests our dosing protocol may be too conservative for patients desiring rapid improvement. Recurrence

can be expected over time; we do not know if maintenance treatments with the device would be of benefit in controlling recurrences. Further study using a more aggressive UV dosing protocol is warranted, which may further reduce the number of treatment sessions required.

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