Lack of Consensus Among Experts on the Choice of UV Therapy for Psoriasis

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Context: Each year tens of thousands of patients in the United States are treated with UV-B radiation or psoralen plus UV-A radiation (PUVA) for a variety of skin disorders. Although PUVA is generally considered more effective, it is also more toxic and more expensive. The degree of consensus among experts in prescribing these alternative treatments has not been quantified.

Objectives: To quantify variation among specialty clinics in the type of ultraviolet therapy used to treat specific skin conditions and assess factors associated with the use of specific treatments.

Design: Survey conducted during two 2-week periods in the late fall of 1994 and early spring of 1995.

Setting: Thirty-nine specialty clinics in 17 US geographic areas in 14 states and Washington, DC.

Participants: A total of 3401 patients treated with UV radiation one or more times.

Outcome Measures: Type of UV therapy used and indications for treatment, age, sex, number of patients treated, and geographic location of each clinic.

Results: The proportion of patients at each center treated with PUVA ranged from 0% to 93% (mean, 41%). Clinic size and geographic location, demographic characteristics of the patients, and diagnosis did not explain these large intercenter differences.

Conclusions: Among specialized clinics, there is little consistency in the use of alternative therapies, which differ substantially in safety and cost, but whose relative efficacy is not well quantified. There is a lack of consensus among experts about the circumstances in which the greater risks and costs of PUVA are outweighed by its possibly greater efficacy, especially in the treatment of psoriasis.

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PARTICIPANTS AND METHODS

We tried to identify and include all providers of UV therapy in 17 defined geographic areas of the United States (in 14 states and Washington, DC) with known high prevalence of HIV. Forty agreed to participate. Hospital-based facilities, medical school faculty practices, and multiphysician groups were the most likely to participate. Thirty-nine of these 40 providers were affiliated with academic medical centers or medical school faculty practices, and thus were likely to provide a substantial proportion of all UV therapy services offered in these 17 geographic areas. They also provided a representative sample of academic leaders in clinical photomedicine.

We collected data during two 2-week periods: the first in the late fall of 1994 and the second an average of 113 days later in the early spring of 1995. For every patient receiving any type of UV therapy at these centers during either of these 2-week periods, we recorded the date of birth, sex, indication for treatment, type of UV therapy administered, and HIV status. We excluded from our primary analyses 1 clinic that enrolled only patients without HIV; the analysis presented here is limited to the 3401 patients without HIV who were treated at participating clinics. To determine statistical significance, we used the $\chi^2$ test for proportions and the $t$ test for comparisons of means. To quantify the association between patient and treatment center characteristics and the use of UV-B vs PUVA, we used logistic regression models (Statistical Software, version 5, 1997; State Corporation; College Station, Tex).

RESULTS

There were 3401 HIV-negative patients receiving UV therapy at the 39 centers analyzed during either or both 2-week study intervals. Overall, 1392 patients (41%) were treated with PUVA, 1746 (51%) with UV-B, and 263 (8%) with a combination of PUVA and UV-B or other treatments that use UV radiation. Only 4% of these 3401 patients were younger than 20 years. The mean age of treated patients was 48 years, and 1956 (58%) were men. The mean age of treated patients was 48 years, and 1956 (58%) were men. The relative use of UV-B and PUVA therapy for patients without HIV, particularly in the treatment of psoriasis, which is the most frequent indication for PUVA and UV-B therapy. Our analysis suggests that these differences are more likely to reflect a lack of consensus among treating physicians than differences in the types of patients treated. A list of the participating investigators and their locations appears at the end of this article.

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B-treated patients (57% and 58%, respectively [$P=.21$]) did not differ significantly.

Psoriasis was the indication for UV therapy in 70% of patients. The next most frequent specific diagnosis (8%) was cutaneous T-cell lymphoma and/or mycosis fungoides (CTCL) (Table 1). Eczema and vitiligo each accounted for about 6% of the cases. A large variety of other diagnoses were listed as the indication for treatment, including a variety of pruritic conditions other than eczema: alopecia (16), lichen planus (15), and parapsoriasis (including pityriasis lichenoides et varioliformis acuta, pityriasis rosacea, and pityriasis lichenoides chronic) (27). The age and sex distribution of patients receiving UV therapy was significantly different among those with different conditions being treated (Table 2). Patients with CTCL were the oldest, and those with vitiligo, the youngest (mean ages, 58 and 39 years, respectively [$P<.001$]). For all indications except vitiligo and other pruritic conditions, men outnumbered women (Table 1).

On average, UV-B–treated patients were treated more often than PUVA-treated patients (mean number of treatments, 1.6 per week for UV-B vs 1.2 per week for PUVA [$P<.001$, $t$ test]). In both groups, fewer than 20% of the pa-
Table 3. Distribution of Centers According to Total Number of Patients Treated With UV Radiation During Both Study Periods

<table>
<thead>
<tr>
<th>Treatment Center Size</th>
<th>No. of Patients Treated</th>
<th>No. of Centers (%)</th>
<th>Average (SD) No. of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>&lt;50</td>
<td>15 (39)</td>
<td>22 (8)</td>
</tr>
<tr>
<td>Midsized</td>
<td>51-100</td>
<td>10 (26)</td>
<td>64 (8)</td>
</tr>
<tr>
<td>Large</td>
<td>&gt;99</td>
<td>14 (38)</td>
<td>174 (55)</td>
</tr>
</tbody>
</table>

Table 4. Patients With Psoriasis Treated With PUVA by Region of the Country*

<table>
<thead>
<tr>
<th>Region</th>
<th>No. of Centers</th>
<th>Patients Treated, % (Mean, Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>14</td>
<td>27.6 (9.2-64.3)</td>
</tr>
<tr>
<td>West</td>
<td>5</td>
<td>30.2† (0-62.5)</td>
</tr>
<tr>
<td>Midwest</td>
<td>4</td>
<td>45.8‡ (20.5-65.0)</td>
</tr>
<tr>
<td>East</td>
<td>8</td>
<td>48.8‡ (7.7-88.9)</td>
</tr>
<tr>
<td>Southwest</td>
<td>6</td>
<td>49.0‡ (28.6-59.6)</td>
</tr>
</tbody>
</table>

*PUVA indicates psoralen plus UV-A. Data do not include patients treated with other or combination treatments or patients treated in the South, which was represented by only 2 centers. †P>.2 compared with proportion treated with PUVA in the Northeast. ‡P<.001 compared with proportion treated with PUVA in the Northeast.

Table 5. Odds That PUVA Rather Than UV-B Treatment Would Be Given to Patients With Psoriasis, According to Patient and Treatment Center Characteristics†

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Unadjusted</th>
<th>Adjusted†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>1†</td>
<td>1†</td>
</tr>
<tr>
<td>&gt;45</td>
<td>1.21 (1.05-1.40)</td>
<td>1.28 (1.09-1.50)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1†</td>
<td>1†</td>
</tr>
<tr>
<td>Male</td>
<td>0.97 (0.84-1.12)</td>
<td>1.19 (1.01-1.39)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eczema, psoriasis</td>
<td>1†</td>
<td>1†</td>
</tr>
<tr>
<td>Other</td>
<td>0.65 (0.53-0.79)</td>
<td>0.64 (0.52-0.78)</td>
</tr>
<tr>
<td>CTCL</td>
<td>7.11 (4.70-10.75)</td>
<td>7.13 (4.67-10.88)</td>
</tr>
<tr>
<td>Vitiligo</td>
<td>55.40 (20.26-151.51)</td>
<td>55.35 (20.14-152.08)</td>
</tr>
<tr>
<td>Geographic location§</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>1†</td>
<td>1†</td>
</tr>
<tr>
<td>East</td>
<td>2.89 (2.19-3.31)</td>
<td>2.66 (2.12-3.33)</td>
</tr>
<tr>
<td>Midwest</td>
<td>2.16 (1.74-2.67)</td>
<td>2.03 (1.60-2.58)</td>
</tr>
<tr>
<td>Southwest</td>
<td>1.83 (1.40-2.38)</td>
<td>2.37 (1.70-3.30)</td>
</tr>
<tr>
<td>West</td>
<td>0.98 (0.79-1.22)</td>
<td>1.19 (0.94-1.50)</td>
</tr>
<tr>
<td>Center size§</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>1†</td>
<td>1†</td>
</tr>
<tr>
<td>Midsized</td>
<td>1.29 (0.98-1.70)</td>
<td>1.01 (0.74-1.38)</td>
</tr>
<tr>
<td>Large</td>
<td>0.91 (0.72-1.16)</td>
<td>1.06 (0.81-1.40)</td>
</tr>
</tbody>
</table>

*PUVA indicates psoralen plus UV-A; CTCL, cutaneous T-cell lymphoma. All data are odds ratio (95% confidence interval). †Adjusted for all other characteristics. ‡Referent stratum. §Data not shown for the South, which included only 2 centers. ||See Table 5 and “Participants and Methods” section for definition.

Patients received 3 or more treatments per week over the 4 weeks of the study. As detailed in Table 2, the proportion of patients being treated with PUVA varied significantly with the indication for treatment. Nearly all cases of vitiligo and 75% of CTCL cases were treated with PUVA, but a third or less with psoriasis or eczema received PUVA treatment.

The 39 centers studied varied greatly in the number of patients treated during the study (Table 3). To determine if the size of the treatment center (as defined by the number of patients treated) and relative reliance on PUVA and UV-B therapy were related, we categorized centers according to the number of HIV-negative patients treated during the study period at each center and divided the centers into 3 groups (Table 3). The number of patients treated at a center and percentage of patients treated with PUVA were not significantly related (P>.1).

For only vitiligo and CTCL was there substantial consistency in the type of treatment used among the centers. For all other indications, the proportion of patients treated with PUVA varied greatly among the centers. At 13 of 39 treatment centers, 25% to 40% of patients treated for psoriasis received PUVA. At an additional 13 centers, less than 25% received PUVA treatment for psoriasis. At only 13 of the 39 centers were most patients with psoriasis treated with PUVA. The size of the treating center and the odds of being treated with PUVA rather than UV-B were not significantly related (large vs small centers odds ratio, 1.20 [95% confidence interval, 0.86-1.67]; midsized vs small centers odds ratio, 0.81 [95% confidence interval, 0.60-1.08]). Men and women were equally likely to be treated with PUVA (male vs female odds ratio, 1.10 [95% confidence interval, 0.86-1.68]). Persons older than 45 years were slightly more likely to be treated with PUVA than younger patients (odds ratio, 1.25 [95% confidence interval, 1.05-1.49]).

We also looked for regional differences in relative reliance on PUVA over UV-B for the treatment of psoriasis. Five geographic regions (the Northeast, East, Midwest, Southwest, and West) accounted for 91% of the patients enrolled. As noted in Table 4, PUVA was used most often to treat psoriasis in the Midwest and least often in the Northeast. In all 5 regions, the proportion of patients with psoriasis treated with PUVA rather than UV-B varied significantly and widely among centers (Table 4). On average, usage patterns in the Northeast and West were comparable and distinctly different from the 3 other geographic regions that included at least 5 centers.

Using logistic regression models, we assessed the association of patient and center characteristics with the odds that a patient would receive PUVA rather than UV-B treatment. Diagnosis, geographic location, and age were all significantly related to the odds that PUVA would be administered (Table 5). Multivariate analysis to adjust for all significantly related variables had little effect on these findings (Table 5). In an analysis of the largest 13 centers, after adjustment for age, sex, diagnosis, and geographic location, the odds of using PUVA varied as much as 25-fold (data not shown).

There was an average of 16 weeks between the 2 two-week enrollment periods of the study. Of the 2235 HIV-negative patients treated during the first period, 1212 (54%) also had UV treatment at the same center during the second period. A slightly higher proportion of patients treated with PUVA (57%) in the fall of 1994 were
still being treated in the winter of 1995 than was the case for UV-B (52%) \( (P < .05) \). Patients treated for CTCL and vitiligo were most likely to be treated during both periods (60% and 65%, respectively). Patients treated for eczema were least likely to still be receiving active treatment 16 weeks after initial ascertainment (46%). Patient age and the likelihood that treatment would be ongoing 4 months after initial ascertainment were not significantly associated \( (P > .1) \). The proportion of patients still under treatment 16 weeks later varied greatly among centers, but the size of the treatment center was not significantly related to the probability that a patient treated in the fall of 1994 would also be using UV therapy in the spring of 1995 \( (P > .2) \).

A few centers seemed to specialize in the treatment of specific conditions. Overall, vitiligo was the indication for treatment for 6% of patients, and at 19 of 39 centers less than 3% of treated patients had vitiligo as their indication for UV therapy. At 1 center, patients with vitiligo accounted for 92% of all patients treated. This single center enrolled less than 2% of all patients, but accounted for 30% of all patients with vitiligo identified in our survey. Two centers accounted for more than 40% of all patients with CTCL enrolled in the 39 centers, but only 13% of all patients. At 30 of the remaining 36 centers, psoriasis was the indicator for treatment for at least 60% of all treated patients.

**COMMENT**

In this study, we assessed relative reliance on the 2 most commonly used alternative UV therapies for skin diseases (PUVA and UV-B) at 39 institutions providing these specialized services in 17 metropolitan areas of the United States. We found great variability in the relative use of UV-B and PUVA at these centers. Although we attempted to identify and include all treatment centers in these diverse geographic areas in our study, we succeeded in enrolling most hospital or academically based centers and few community-based practices. All but 3 of the 39 centers we studied had a staff member who had published articles concerning psoriasis or phototherapy. As a result, our findings reflect the usage pattern of UV treatment nationwide at centers directed by dermatologists often considered leaders in this field.

This study provides an assessment of treatment practices during two 2-week periods an average of 16 weeks apart. Since psoriasis is a chronic disease and these treatment regimens are long established, these 2-point prevalence data provide an accurate picture of differences among treatment used in a population of patients with skin disease, especially psoriasis. For individual patients, the prior (and future) treatments used will vary according to a variety of factors, including severity, past response to treatment, and where they choose to be treated over time. Our population-based analysis did not assess differences in treatment over time for an individual. Rather, it demonstrated substantial differences among centers in their use of treatment for a chronic disease during the study period. It is unlikely that 1 disease or varying demographic factors explain these differences in practice among centers.

Differences in referral base and the special interests of clinicians at various sites may explain some of the variability in the number of patients treated per week and the relative importance of different indications for treatment among centers. These factors, however, are unlikely explanations for the substantial differences in the type of UV therapy used. The relative reliance on UV-B and PUVA among these 39 clinics differed greatly—far more than we expected. In an attempt to account for this wide variation, we examined the demographic and disease characteristics of patients treated as well as the possible impact of the size of the centers and their geographic locations. Indication for treatment and the proportion of patients treated with PUVA were strongly associated for only 2 diagnoses. Patients with vitiligo were almost always treated with PUVA, and most patients with CTCL were also treated with PUVA at most centers.

Psoriasis accounted for just over two thirds of all HIV-negative patients treated with UV therapy at the 39 centers. Overall, PUVA was used in about a third of psoriasis cases. In the univariate analysis, there was no association between sex or age and the odds of PUVA being used to treat psoriasis in patients older than 20 years. Centers in the Northeast and West had comparable overall rates of use of PUVA for UV therapy for patients with psoriasis. Centers in the Southwest, East, and Midwest were significantly more likely to use PUVA for such patients than those in the Northeast and West. The reliance on PUVA among centers in each region varied greatly. After adjustment for region, sex, center size, and diagnosis, persons older than 45 years were only very slightly more likely to be treated with PUVA than younger patients with psoriasis.

Age, sex, indication for therapy, and size of treatment center do not provide any systemic explanation for why PUVA is used so much more often in some centers than in others. The regional differences in use suggest that within a geographic area, practitioners are likely to agree on the relative efficacy and safety of these treatments. Still, the extremely large differences in use patterns between centers within regions, even after adjusting for sex and center size and controlling for diagnosis, suggest that there is no firm consensus among the leaders in the field of UV therapy about the circumstances in which PUVA or UV-B is preferable.

We analyzed our data to determine if they suggested that either therapy had greater efficacy. We hypothesized that if PUVA led to more long-lasting remissions and was more rapidly effective, a smaller proportion of patients with psoriasis treated with PUVA in the fall of 1996 would still be receiving treatment an average of 16 weeks later during our second period of data collection. To our surprise, this hypothesis was not supported by our data. Patients treated in larger centers and those treated in centers that used PUVA to treat a higher proportion of patients with psoriasis were slightly more likely to undergo UV treatment 16 weeks later than patients treated at smaller centers or centers that relied more often on UV-B. Selection of more severely affected patients for PUVA therapy might, however, explain this finding.

There is a large body of literature that demonstrates substantial variation in the use of various proce-
dures and treatments in different patient groups. Geographic, racial, economic, and many other factors have all been associated with these variations, as have physician characteristics. In our study group, large differences in choice of therapy were observed across geographic areas, and most patients treated for psoriasis were white. We were not able to assess the extent to which, if at all, the higher average reimbursement for PUVA vs UV-B might have influenced physician practices. We are unaware of studies that demonstrate as large a variation in practice patterns as ours among practitioners who share not only specialty training but in most cases a common subspecialty interest within dermatology, and who practice in similar settings.

Each year tens of thousands of patients in the United States receive UV treatment for a wide variety of cutaneous disorders. Our study demonstrates wide variation in the relative reliance on UV-B and PUVA, even at centers supervised by acknowledged UV therapy experts. We believe this variation reflects a lack of comprehensive and clear-cut data that demonstrate relative efficacy and safety of alternative types of UV therapies. We fear this lack of consistency in the use of specialized treatments may be common in other areas of medical practice as well. Since the practices of "experts" vary so greatly, we must assume that many who practice "light" therapy are in the dark when they decide which type of treatment is most likely to provide the optimal balance between benefit and risk for the individual patient.

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REFERENCES


Submissions for Special Features

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Readers are invited to submit examples of newly described disorders, the use of new diagnostic technology, dermatologic manifestations of important social disorders such as child abuse, and cases that highlight the complex nature of acute care dermatology to Anita G. Licata, MD, Division of Dermatology, UHC, 1 S Prospect St, Burlington, VT 05401-3444. When appropriate, these should be written in case presentation format with a brief discussion following.

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