
Combination therapy with 308-nm excimer laser, topical tacrolimus, and short-term systemic corticosteroids for segmental vitiligo: A retrospective study of 159 patients

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Background: Segmental vitiligo (SV) is characterized by a unilateral and localized distribution, early onset, and stable disease after rapid progression. And SV is often associated with poor response to various treatment modalities.

Objective: We sought to evaluate the effectiveness of combination therapy with 308-nm excimer laser, topical tacrolimus, and short-term systemic corticosteroids for SV, and to search for factors associated with the treatment response.

Methods: A retrospective interventional case-series study was performed on 159 patients with SV who were treated with the combination therapy for more than 3 months.

Results: The rate of 75% or more repigmentation was 50.3% after a median treatment duration of 12.1 months; 36.5% and 13.8% of the patients showed nearly complete (75%-99%) and complete (100%) repigmentation, respectively. Multivariable analysis showed the following to be independent factors with poor response: disease duration longer than 12 months (odds ratio 0.372, 95% confidence interval 0.157-0.882, $P = .025$), poliosis (odds ratio 0.494, 95% confidence interval 0.247-0.988, $P = .046$), and plurisegmental subtype (odds ratio 0.175, 95% confidence interval 0.065-0.474, $P = .001$).

Limitations: This was a retrospective study.

Conclusion: The combination therapy is effective for SV. Prolonged disease duration, poliosis, and plurisegmental subtype were shown to be independent prognostic factors of poor response in patients with SV. (J Am Acad Dermatol 2015;73:76-82.)

Key words: excimer laser; laser; segmental vitiligo; vitiligo.

Vitiligo is a common acquired pigmentary disorder of the skin and mucous membranes, which affects 0.5% to 1% of the population. Vitiligo can be psychologically devastating, especially in ethnic populations, in whom it is more easily noticeable.¹ Segmental vitiligo (SV) is a

Abbreviations used:

NBUVB: narrowband ultraviolet B
OR: odds ratio
SV: segmental vitiligo
UV: ultraviolet

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distinct subset, characterized by a unilateral distribution, early onset, and stable disease after rapid progression.² SV is often associated with poor response to conventional treatments for vitiligo including topical and systemic corticosteroids,³ topical calcineurin inhibitors, and narrowband ultraviolet (UV) B (NBUVB) phototherapy^{4,5} and therefore frequently requires surgical treatment.⁶

The 308-nm xenon chloride excimer laser has been introduced to treat vitiligo in a targeted way that allows the delivery of higher fluences to the depigmented lesions, sparing uninvolved skin. Clinical studies showed that excimer laser treatment was associated with a faster onset of repigmentation and fewer treatment sessions for a successful response compared with conventional phototherapy, and it currently represents the treatment of choice for localized vitiligo.⁷ However, recent studies on excimer laser treatment for SV produced unsatisfactory results ($\geq 75\%$ repigmentation: 23.8%),⁸ and a lower repigmentation rate than that of treatment for non-SV (odds ratio [OR] 0.42, $P = .029$).⁹

This study was performed to evaluate the effectiveness of combination therapy with 308-nm excimer laser, topical tacrolimus, and short-term systemic corticosteroids for SV and to determine independent prognostic factors associated with treatment success.

METHODS

Study design and population

This is a retrospective interventional case-series study in a private dermatology clinic. Medical records and photographs of 159 patients with SV (female 58.5%; median age 24 years, range 1-62; Fitzpatrick skin types III or IV) who were treated with 308-nm excimer laser, topical tacrolimus, and short-term systemic corticosteroids from July 2008 to December 2012 were retrieved and analyzed. SV was defined as a unilateral depigmented lesions arranged in a linear or quasidermatomal distribution that usually stopped abruptly at the midline of the affected segment. All patients with SV who were given a diagnosis for the first time and treated with 308-nm excimer laser therapy for more than 3

months or who achieved complete repigmentation within 3 months were included. Exclusion criteria were as follows: patients with mixed, focal, or undifferentiated vitiligo, and patients who had undergone other treatment modalities for vitiligo at another hospital within the last 6 months.

All patients were treated with the 308-nm xenon chloride excimer laser (XTRAC, PhotoMedex, Horsham, PA) on 2 nonconsecutive days a week. The initial dose was 100 to 300 mJ/cm², depending on the body site. If erythema lasted more than 48 hours, the dose was kept constant; otherwise, the dose was increased by 10 to 100 mJ/cm² in each subsequent session, depending on the previous dose. If painful erythema or blistering developed, the treatment was interrupted until resolution of the symptoms and resumed at the dose used in the previous session. Topical tacrolimus 0.1% ointment was applied con-

currently to all vitiliginous lesions throughout the treatment period. The patients aged 19 years or older received 20 mg of prednisolone daily for the first 3 weeks, and the patients younger than 19 years received 0.3 mg/kg prednisolone (maximum daily dose: 20 mg).

Covariables

Age, sex, age of onset, Fitzpatrick skin type, body site, disease duration, size, presence of poliosis, body side involved (right and left), and subtypes (unisegmental, bisegmental, and plurisegmental) were used as explanatory variables for this study. The maximal and cumulative UV dosages, duration of treatment, and number of treatment sessions were collected from the medical records. All patients with vitiligo who had an onset of disease before 12 years of age were categorized as having childhood-onset vitiligo.

Assessment of clinical outcomes

Clinical outcomes were evaluated based on clinical photographs obtained at baseline and on a weekly basis. Two blinded dermatologists (J. M. B. and H. J. Y.) compared the initial pretreatment photographs with the final follow-up photographs and assessed the percentage of skin repigmentation

CAPSULE SUMMARY

- Segmental vitiligo is often associated with a poor response to various treatment modalities.
- In this retrospective study, 50.3% of 159 patients with segmental vitiligo achieved at least 75% repigmentation using combination therapy consisting of 308-nm excimer laser, topical tacrolimus, and short-term systemic corticosteroids.
- Disease duration longer than 12 months, presence of poliosis, and plurisegmental subtype were shown to be independent prognostic factors of poor response in patients with segmental vitiligo.

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