



ORIGINAL RESEARCH PAPER

Dermatology

THE 308-nm EXCIMER LASER: AN EXCEPTIONAL TREATMENT MODALITY IN VITILIGO- A CASE SERIES

KEY WORDS: Excimer laser, targeted phototherapy, time efficient, repigmentation.

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ABSTRACT

Objective: Vitiligo is a common depigmenting condition that carries a high psychosocial morbidity and social stigma. Present treatment modalities for vitiligo like topical corticosteroids, immunomodulators, phototherapy with psoralens plus UVA radiations and broadband or narrowband UVB radiation phototherapy requires many months of treatment with not so promising results. The excimer laser comprising of a targeted phototherapy with single wavelength laser light is a new treatment option which may be time efficient and a better treatment option in terms of repigmentation in management of vitiligo.

Design: A case series of 3 cases.

Methods: Patients with stable depigmented patches were treated with 308 nm xenon-chloride excimer laser. Lesions were treated 3 times a week for a maximum of 20 treatments. Treatment was withheld if erythema or blistering was observed and held until resolution. The untreated depigmented patches elsewhere on the body were considered as controls.

Patients and methods:

Patients- 3 patients were included in this comparative, prospective, randomized study. The inclusion criteria for selection were - age group of 7-40 years old patients, having stable depigmented patch for the past 3 months and the presence of atleast 2 pairs of patches after giving an informed consent form.

Methods- 3 patients with stable vitiligo patches were enrolled in the study. After explaining the procedure and giving the required information, a written informed consent was obtained from all patients. Most of the patients had received and did not respond to the other treatment modalities for vitiligo. No patient received any additional vitiligo therapy for at least 1 month before study entry or during the study.

3 patches from 3 patients were treated with the excimer laser. All patients had separate, untreated vitiligo patches which were considered as control sites. Minimal erythema dose (MED) was calculated before starting the treatment sessions and patient was told to follow up to look for the response after 24 hours. The treatment sessions with 308-nm xenon-chloride excimer was started at a minimum of 6 seconds and was increased by 3 seconds in every session till significant erythema was seen over the patch. Lesions were treated 3 times a week for a maximum of 20 treatments. Treated areas were evaluated for repigmentation and erythema on separate 4 point-scales. Repigmentation was graded according to the percentage of repigmentation in the treated area: 0=0%, 1 = 1% to 25%, 2 = 26% to 75% and 3 = 76% to 100%. Patients with no repigmentation were defined as non- responders. Patients were photographed before and after each treatment.

RESULTS:

2 patients (case 1 & 2) achieved repigmentation of grade 2 (i.e., 26-75%) and 1 patient (case 3) achieved repigmentation of grade 3 (i.e., 76-100%)



Figure 1- Case 1- before and after photos- Repigmentation starting from the peripheral borders of the vitiliginous patch on the right.



Figure 2- Case 2- Repigmentation seen from the borders of the patches of knees. Complete repigmentation of some macules and small patches over the pretibial skin with partial repigmentation over the large patches. Significant erythema over the patches seen.



Figure 3- Case 3- Almost complete repigmentation seen over the vitiliginous patch.

DISCUSSION:

Vitiligo is a common autoimmune disorder of cutaneous depigmentation that causes destruction of melanocytes leading to depigmentation. This disease affects approximately 1-2% of the world population with no predilection for age, sex or racial background. The present therapies for vitiligo require many sessions for a larger time frame and sometimes result in disappointing outcomes. Common treatment modalities include psoralen plus UVA (PUVA) and broadband or narrowband UVB phototherapy. Vitiligo is characterized by complete absence of melanocytes within the affected patch. The aim of phototherapy is to stimulate adjacent melanocytes, presumably those persisting within the hair follicles, to migrate and proliferate in the vitiliginous patches.

Phototherapy with UVA radiation and oral psoralens consist of oral intake of 8- methoxypsoralen at a dose of 0.5 mg/kg followed by UVA irradiation at intervals of 2-3 times/ week. This method requires a prolonged treatment course and may yield minimal results. Partial repigmentation is seen in 30-40% of patients [1-3]. However, fewer than 20% of patients will experience full repigmentation.

Topical PUVA is commonly considered for localized patches and consists of applying a topical preparation of 0.05% to 0.1% methoxypsoralen, followed by UVA radiation 2-3 times/week. The benefit of use of topical preparation over oral PUVA are the systemic side effects likely to be caused by oral PUVA.

Patients with extensive depigmented vitiliginous patches can be considered for narrowband UVB phototherapy with wavelength of 311 nm. PUVA has long been a mainstay of treatment for vitiligo, but over the last decade NB-UVB has been increasing in use due to decreased incidence of phototoxic side effects [4,5]. Westerhof et al describe treatment consisting of phototherapy at intervals of two times per week for 4 to 12 months [6]. Partial repigmentation was reported in 67% of patients after 4 months of treatment. Of these patients, 8% showed greater than 75% repigmentation. A subsequent study evaluating narrowband UVB phototherapy in children with vitiligo demonstrated 75% repigmentation in 53% of patients and stabilization of the disease in 80% patients with only minimal adverse effects [7].

Excimer laser treatments show faster onset of repigmentation and need fewer treatments with less cumulative dose in order to achieve repigmentation compared with traditional phototherapy. Both 308-nm excimer laser and 311-nm narrowband- UVB are photobiologically very close, but the laser is mono chromatic, penetrates deeper, and is applied in a targeted way that allows the delivery of higher fluences to the lesions and spares the uninvolved skin resulting in more and faster effectivity with lesser side effects. So, 308-nm excimer laser therapy is a safe and effective method of phototherapy for vitiligo [8,9-12]. As first line therapy, it should be considered when vitiligo is localized. The best response is noticed on UV-sensitive areas such as the face and neck; in others, a combination with steroids, tacrolimus or pimecrolimus may be considered.

On the basis of the above data, we commenced on a study of targeted phototherapy using a single wavelength 308 nm UVB laser to treat focal areas of vitiligo. When compared with other conventional treatment modalities of vitiligo, the 308 nm xenon chloride excimer laser has the advantage of precision and the ability to deliver higher energy fluences to the target tissue in lesser time. Additionally, the 308 nm excimer laser has recently been reported to be effective in the management of psoriasis, thus supporting its application for the treatment of vitiligo [10]. The 308 nm excimer laser with targeted phototherapy with single wavelength laser light is a treatment alternative that may prove to be time efficient and effective

therapeutic option for the management of vitiligo.

CONCLUSION:

The degree of repigmentation achieved by excimer laser in an abbreviated time frame and lower cumulative doses and sessions is extraordinary as compared to the other commonly utilized therapies in vitiligo. The xenon- chloride 308-nm excimer laser may prove to be an efficacious treatment modality for the management of stable vitiligo.

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