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Exposure to sunlight as adjuvant therapy for dyshidrotic eczema

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SUMMARY

Manifestations of dyshidrotic eczema can be alleviated by exposure to medium and high doses of ultraviolet A1 (UVA1) radiation. Since the induction of apoptosis of T cells by UVA1, as the basic mechanism of therapy, is proportional to the dose of radiation it is to be expected that in mild cases or for maintenance therapy low doses of radiation will also be effective. UVA1 radiation is a constituent of sunlight, so exposure to sunlight could prove beneficial in treating dyshidrotic eczema.

Introduction

Dyshidrotic eczema is a common dermatological entity characterized by formation of vesicles, pruritus and desquamation on the palms and lateral sides of the fingers and the soles of the feet. There are several therapies that alleviate manifestations of dyshidrotic eczema. Topical steroids are the mainstay of therapy and systemic glucocorticoids, psoralen and ultraviolet A (UVA) irradiation (PUVA), intradermal botulinum toxin, ultraviolet A1 (UVA1) and immunomodulating agents (cyclosporine, methotrexate, mycophenolate mofetil) are effective [1]. However, recurrences are frequent and dyshidrotic eczema seems to show chronicity in many patients.

A high-dose UVA1 (130 J/cm^2) in a cumulative dose of 1720 J/cm^2 and a medium-dose UVA1 (40 J/cm^2) in a cumulative dose of 600 J/cm^2 produced a clinically significant effect on the exacerbations of dyshidrotic eczema [2–4].

Studies of the mechanism of the effect of UVA1 demonstrate that induction of apoptosis is the basic mechanism of UVA phototherapy [5]. Apoptosis of transformed T and B lymphocytes induced by UVA1 is proportional to the dose of UVA1 in a linear manner [6].

Theory

The proportionality of the apoptotic effect to the UVA1 doses suggests that low doses of UVA1 might show some effect that could be evident in cases of mild eczema. The hypothesis is that for patients with Dyshidrosis Area and Severity Index (DASI) scores (maximum is 60) [3] in the interval 4–15 (vesicles, pruritus, desquamation and erythema graded as low or absent) low doses of UVA1 could prove efficient. Since the intensity of UVA1 in sunlight is such that 10–15 min of exposure can yield approximately 5 J/cm^2 [7] it is expected that exposure to sunlight will alleviate symptoms and could be used as an adjuvant or maintenance therapy. It could reduce the need for other forms of therapy that cause more side effects, possible long term effects and are more complicated, time consuming and costly to administer.

Discussion

The patients in studies addressing UVA1 radiation therapy had in most cases exacerbated forms of dyshidrotic eczema (DASI scores 10–30 and more) and did not use any medications or form of therapy during a predefined period before UVA1 therapy. This means that UVA1 therapy was tested as a monotherapy and not in combination with other therapeutic modalities. However, in cases of atopic eczema UVA/UVB (spectral characteristics comparable to sunlight) therapy (UVA1 component was 7 J/cm^2) did show some effect in exacerbated cases [8].

The time interval was chosen to be 10–15 min to avoid exposure to more than 1MED (minimal erythemal dose) of UVB radiation for skin type II (it holds for UV index up to 11, for 10 min exposure UV index 15 is tolerable) and because it is similar to times of exposure with UV lamps. The palms are rarely exposed to sunlight unintentionally, so there is very small probability that they will be exposed to additional sunlight. The highest intensity of UVA1 radiation is to be expected in summer months at midday [9]. It has been suggested that cycles of UVA1 therapy be performed not more than twice a year [4]. This means exposure to a cumulative dose of between 600 J/cm^2 and 3440 J/cm^2. The lower limit of this interval could be reached in at least 120 exposures to sunlight.

When UVA1 therapy was used for therapy of other skin diseases, good therapeutic effects were also accomplished with lower cumulative doses than 600 J/cm^2 [10]. It is reasonable to expect similar effects for dyshidrotic eczema.

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Conclusion

Exposure to sunlight is a simple and possibly efficient way to treat mild dyshidrotic eczema or to maintain the good therapeutic effects achieved by other therapeutic approaches. Cumulative doses equal to those applied during a medium-dose UVA1 therapy, which has already proved effective, could be reached. The ease of use and availability of the source make exposure to sunlight an attractive alternative or addition to other forms of therapy.

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