

Ultraviolet Light Therapy in Atopic Dermatitis

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In 1979-1981, 107 patients with atopic dermatitis were treated with Psorilux® 9050 emitting 1.24 mW/cm² at 280-315 nm and 7.33 mW/cm² at 315-400 nm. Half of the patients received one treatment course, 20% 2-3 courses, and one third more than 3 treatment courses. A good result was obtained in 93% of the cases but in the other cases the treatment was either ineffective or the patients were too sensitive to the radiation. After the treatment, the need for treatment with topical corticosteroids had decreased in one half of the patients and increased in only 2% of them. In 1982-1983, 89 atopics were treated with Metec Helarium® model 1480, emitting both UVB and UVA (310-340 nm, with a peak at 320-330 nm). One treatment course, 3-45 weeks (mean 19 weeks), was given to 69 patients, and two treatment courses to 20 patients. The treatment was effective in 94% of the patients. The others did not respond. After the treatment, the need of treatment with topical corticosteroids had decreased in 85% of the cases, and increased in none. Psorilux® therapy caused II degree burns in two patients and erythema lasting >24 hours in 11 patients. Erythema was encountered in 14 patients receiving Metec Helarium® therapy but in no cases II degree burns. Seventeen patients received both Psorilux® and Metec Helarium® therapies and 14 of them preferred the latter. *Key words:* Atopic dermatitis; Ultraviolet light; UVB; UVA.

The healing effect of sunlight on many diseases was well-known already at the dawn of mankind (1). Hippocrates, the father of medicine, recommended the use of sunlight and water in the treatment of various dermatoses.

In the thirties artificial light sources became available to skin clinics, one of which was the dermatology department of Finseninstitutet in Copenhagen. Carbon arc light and "Höhensonne" were used in atopic eczema, psoriasis, lichen planus, and in many other dermatoses (2). In carbon arc radiation, there was little UV-radiation, in contrast to Hg-radiation which contained several narrow bands of UV, mostly in the region of UVB (280-320 nm).

In recent years, equipment with various new types of fluorescent UV light tubes, and mid-pressure light sources containing Hg, other metals and halogens, have enhanced our possibilities to treat dermatological patients easily and safely. We here present results from treatment of patients suffering from atopic dermatitis with Psorilux® 9050 and with Metec Helarium®. The former is mainly a UVB source, while the latter emits both long UVB and short UVA waves, making it a UVAB source.

MATERIALS AND METHODS

In 1979-1981, 107 patients with severe atopic dermatitis, 69 females and 38 males, 7-45 years of age (mean 26 years), were treated with Psorilux® 9050 (Original Hanau Heraeus GmbH, Hanau) emitting 1.24 mW/cm² at 280-315 nm, and 7.33 mW/cm² at 315-400 nm. In this article referred to as UVB therapy. Most were in-patients receiving the therapy once daily. In addition they were treated with mild corticosteroid creams, usually hydrocortisone or hydrocortisone butyrate, for some days in the initial phase of each UVB treatment course. The treatment was given until a clear-cut effect was achieved, which took an average of 9 days (4-19 days). The initial UVB dose was 6-12 mJ/cm² (5-10 sec), and the dose was increased every second day up to 12-93 mJ/cm² (10-75 sec). One treatment course was given to half of the patients, while more than 3 courses were given to one third of the patients.

In 1982-1983, 89 atopics, 58 females and 31 males, 5-51 years of age (mean 26 years) were treated with Metec Helarium® model 1480 (Metec GmbH, Munich) emitting both UVB and UVA, from 310 to

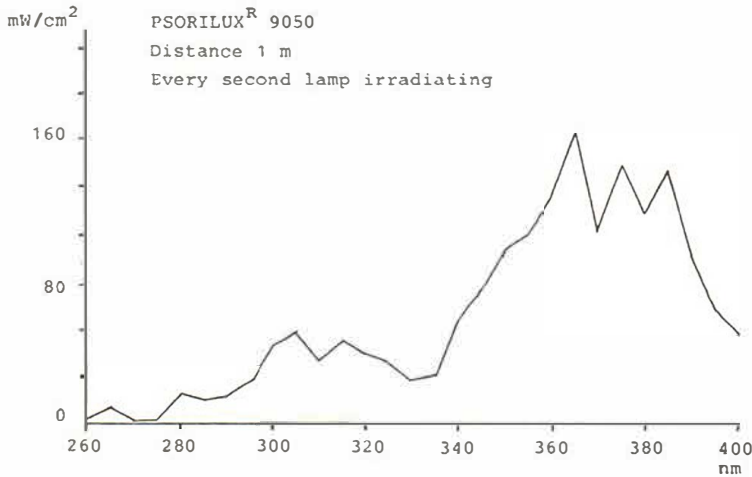


Fig. 1. Spectral irradiance of Psorilux[®] 9050 measured at 1 m distance with EG & G 580/585 spectroradiometer with every second lamp of the equipment burning.

340 nm (with a peak at 320–330 nm). The irradiance was about 12 mW/cm² at 315–400 nm. All the patients subjected to this UVAB therapy were out-patients receiving 3–5 treatments per week for 4–6 weeks, after which 1–2 treatments per week were given for up to 45 weeks. The UVAB dose was gradually increased from 1.5–4 to 12–21.6 J/cm² (from 2–5 to 10–30 min). The severity of the patients' dermatitis was similar to that of the UVB group, i.e. the great majority had erythrodermia or widespread dermatitis which responded poorly to topical corticosteroid therapy. During the UVAB therapy, topical corticosteroids were in most cases used on lichenified areas only.

An inquiry about the course of the atopic disease was sent to the patients when more than half a year had passed since termination of the treatment. Ninety of the 107 patients treated with UVB and all the 89 patients treated with UVAB answered the questionnaire.

The result of the light therapy was considered as good when only some lichenification was left on wrists, ankles, cubital fossae, and neck; and as poor when the need for treatment with topical corticosteroids did not diminish and little or no healing of the dermatitis was achieved.

RESULTS

The result of the UVB therapy was good in 93% of the cases and poor in 6%. One patient became worse. This particular patient was found to be light sensitive, which was not known when the treatment was instituted.

After the light therapy, the need for treatment with topical corticosteroids was reduced in 51% of the UVB treated patients, remained unchanged in 47%, and increased in 2%.

UVAB therapy gave a good result in 94% of the cases. Only 6% of the patients did not respond. After the UVAB treatment the need for treatment with topical corticosteroids was clearly reduced in 83% of the cases and remained unchanged, when compared to the amounts of ointments used before the light therapy, in 17% of the patients.

Seventeen patients were treated both with Psorilux[®] 9050 and with Metec Helarium[®], and 14 of them preferred the latter therapy as being more effective.

UV erythema and I–II degree burns were the only side effects found during the therapies. UVB caused erythema or I degree burns in 24%, and II degree burns in 2% of the cases while the corresponding numbers in the UVAB group were 16 and 0%.

DISCUSSION

Atopic disorders are encountered in over one third of the young people in Finland (3). The occurrence of these diseases might also be of the same frequency in other countries with a

shortage of sunlight and with a long annual period of cool or cold weather. In most patients with atopic dermatitis the eczemas are better or even disappear during the summer. Therefore we expected that light therapy was of great benefit in our cases of widespread atopic dermatitis. Both treatments were effective in a vast majority of the cases, and UVAB therapy (Metec Helarium®) seemed to be better than UVB (Psorilux® 9050).

Over the last few years many types of equipment with various light spectra have been introduced. In the original "Höhensonne", there is quite a lot of UVC light due to the use of Hg as the emitter of the light. The spectrum of Psorilux® contains little UVC but is rich in UVB and longer wavelengths (Fig. 1). Helarium® light is a mixture of UVB and UVA but contains also visible and infrared rays. Fluorescent sun lamp tubes, such as Sylvania UV6 and Philips TL12, emit UVB rays to such an extent that other wavelengths probably have no influence on the therapy because of the short irradiation times.

The term Selective Ultraviolet Phototherapy (SUP) has been used for UV therapy with Saalman lamps (4) to distinguish this type of therapy from photochemotherapy. Saalman lamps are special metal vapour lamps emitting narrow bands of UVB and short UVA but also UVC. The term SUP has also been used for therapy with Helarium® and Psorilux®. To avoid confusion, it seems more correct to use the term UVB treatment when the UV light is mostly or solely in the UVB range, the term UVAB treatment when the radiation consists of UV-light mostly at 310–330 nm, and the term UVA treatment when practically no radiation beneath 320 nm is present.

When compared with UVB therapy, UVAB therapy in atopic dermatitis is more effective, has fewer side effects, and there is less need of corticosteroid creams even after the therapy. The disadvantage of the UVAB therapy is the long exposure time and, consequently, sweating during the therapy, which may increase itching for a while. However, both therapies are effective in widespread atopic dermatitis, even if the lichenification does not decrease very much. Systemic photochemotherapy might be even more effective (5), but the long term risks of photochemotherapy suggest that it should not be used to treat dermatoses responding to safer therapy.

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