

PHOTOCHEMOTHERAPY OF PSORIASIS

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Summary

64 psoriatic patients having more than 20% body involvement were exposed 2 hours after the ingestion of 8-MOP to high intensive longwave artificial UV light in a hexagonal chamber 3 to 4 times a week. 77% of the patients showed very good response. No serious side-effects were observed.

The need for a safe and effective therapy for the control of psoriasis vulgaris is evident from the many new treatment schedules developed in the last decade. Corticosteroids have too many side-effects including that of rebound psoriasis. Methotrexate and other systemic cytotoxic drugs effectively control psoriasis but have serious side-effects such as bone marrow depression and liver damage which limit their usefulness.

Gadgil¹ from Bombay published his initial encouraging report on photochemo therapy for psoriasis in 1978. This was the first study from our country, in which longwave ultraviolet light system was combined with oral methoxsalen in cases of psoriasis.

Methoxsalen has been used systemically in the treatment of vitiligo for over 2 decades^{2,3}. Parrish et al⁴ reported successful treatment of psoriasis com-

bining oral methoxsalen with a high intensity longwave ultraviolet light system.

Our study was undertaken to confirm the effectiveness of photochemotherapy in Indian patients suffering from psoriasis. Photochemotherapy, a totally new approach combining photosensitizing psoralens with longwave ultraviolet light, is the latest advance in the treatment of psoriasis. This treatment is simple and does not involve topical application or hospitalization. It has no serious side-effects and acceptance of this therapy by patients is very good.

Materials & Methods

A total number of 64 psoriatic patients, with over 20% body involvement (according to Wallace's rule of 9), were chosen. Patients below the age of 12 years, pregnant women, patients with pustular psoriasis and aphakia were excluded from the study.

Out of 64 patients, 44 were males and 20 were females. The age of the patients ranged from 14-65 years, the average being 40 years. The duration of the disease varied from 3 months to 30 years, the average being 11 years. Many of the patients had earlier used conventional therapy in the form of

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topical or oral steroids; topical coal tar or salicylic acid ointment preparations, methotrexate, homeopathy, Ayurvedic medicaments and even auto-urine therapy, with varying benefits.

A detailed history and clinical examination with laboratory investigations such as complete haemogram, liver function tests, skin biopsy (histological examination) and fundoscopy were carried out before and after complete clearance of psoriatic lesions. No topical treatment except emollients (coconut oil) was allowed to be used. Methoxsalen was administered in the dose of 0.6 mg per kg of bodyweight. The patients were instructed to swallow the tablets on a full stomach and were exposed 2 hours later to longwave ultraviolet light.

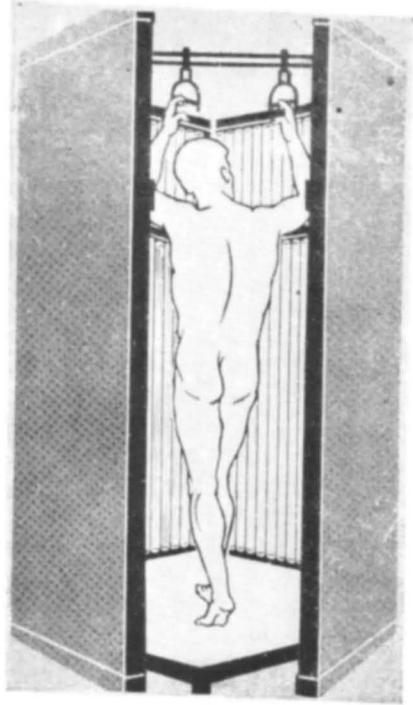
The minimum phototoxic dose (M. P. D.) test was carried out to screen out patients suffering from any other photosensitizing dermatosis. This test was done by sticking a piece of plaster, with 6 apertures on the lower part of the patient's back and exposing him to the testing panel consisting of 8-two feet UV tubes, mounted on a wooden panel.

The patients were followed up 24, 48 and 72 hours later, for reaction at the test sites. None of the patients developed erythema after the test dose but instead a pigmentation was seen at the test-sites. The minimum pigmentation was selected as the starting dose for exposure in the UV chamber.

The patients were exposed to long-wave ultraviolet light (320-390 nm) with a peak at 365 nm, in a hexagonal chamber. The chamber was fitted with 64-two feet TL/09 20 watts and 64-four feet TL/09 tubes arranged inside the wall, with an aluminium reflecting surface at the back.

The patient was made to stand in the centre of the chamber, without clothing, (Fig 1) wearing snugly fitting goggles to

protect his eyes during exposure. The distance from the patient's body surface to the tube surface was about 30 cms.



The chamber is open on the top for ventilation and proper circulation of air. Patients were exposed either 3 times on alternate days or four times a week. The starting dose was 10 joules/cm² (15-25mins.) ending with 25-30 joules/cm² (70-80 mins). Exposures were given with a rise of 1 to 2 joules at each exposure.

II 442 Phototherapy Radiometer used by us measures accurately the ultraviolet radiation required for the treatment. It consists of a transistorized battery operated console and a sensitive detector probe. The control panel contains a read out meter which reads directly ultraviolet light in milliwatts/cm². The probe plugs into the control unit via a convenient 7 ft. cord. The detector assembly (probe) is a filtered detector designed to provide

a spectral response in the UVA region of ultraviolet spectrum from 320-400 nm.

Observations

There were no pre- or posttreatment changes found in haematological, biochemical or fundoscopy findings.

All the patients who showed a good clinical response showed complete regression of psoriasis of the skin which was confirmed by histopathological examination of the skin. All the patients showed a uniform tan all over the body after UV exposures, which gradually faded during maintenance therapy.

Some of the patients showed macular hyperpigmentation at the sites of lesions which faded with time. Nail lesions did not show any regression. At times a dark pigmentation was seen at the base of the nails. Arthritis and joint involvement did not improve with this therapy.

Scalp lesions showed variable responses. The cause of this may be attributed to the fact that hair prevents penetration of UV rays on the scalp. The response to therapy was judged as per criteria of Pathak and Fitzpatrick which are shown in Table No. 1.

The average number of exposures given was 23 and average number of joules was 406. On an average the lesions started showing initial improvement after 6 exposures and definite improvement after 12 exposures.

Side-effects. All the patients under treatment tolerated it well. Transient nausea and occasional itching, which was observed in the initial period of the treatment disappeared as the treatment was continued. Very few patients required antihistamines to counteract itching and nausea.

Discussion

Until recently, the therapy for psoriasis was largely a topical form of treatment which was cumbersome, time-consuming, messy, disagreeable and eventually frustrating to the patients. Corticosteroids, methotrexate and other cytotoxic agents, provided the alternative for topical treatment. Their side-effects are well known. Photochemotherapy combining 8-methoxypsoralen with longwave ultraviolet light has proved to be an effective method for controlling psoriasis. The results of the present study confirm the observation by Parrish⁴ et al and other authors^{5,6}.

TABLE 1
Response to Therapy

Grade	Criteria	% Improvement (Compared to original status of disease)
-1	Psoriasis worse	0
0	No change	0
1	Minimal improvement - slightly less scaling and/or erythema	5-20%
2	Definite improvement - partial flattening of plaques, less scaling and less erythema	20-50%
3	Marked improvement - complete flattening of all plaques but borders of plaques still palpable	50-55%
4	Complete clearing - complete flattening of plaques including borders; plaques may be outlined by pigmentation.	95%

Photochemotherapy represents a principle of treatment that may initiate a new era of UV light therapy. The interaction of light, which photo-reacts with nucleic acid of the proliferating epidermal cells inhibit their DNA synthesis⁷. Total number of joules required to obtain complete clearance of psoriatic lesions, show a wide variation. Some workers in this field have claimed clearance of lesions with 5 joules and some with 500 joules. The mean number of joules required for complete clearance in our study is 406 joules/cm².

TABLE 2

Patient No.	Grade of Improvement	%
37	IV	66
6	III	11
4	II	7
6	I	11
3	0	5
8	Dropout	—

TABLE 3
Results of Follow-up

Weeks after 1st treatment	No. of Patients
1 — 4	7
5 — 10	3
11 — 15	0
16 — 20	8
21 — 25	2
26 — 30	3
31 — 35	2

The time required to expose a patient to a given dose varies in accordance with intensity of the source of UV light. At present we have 2 UV cabins of different intensities and we have observed the average total number of body exposures required for complete clearance of the patient, as both the chambers are more or less the same.

Even after reviewing the world literature on PUVA, we have not come across a reference wherein the intensity of light source is co-related to the number of

exposures required for clearance. We are of the opinion that it is the total number of exposures for clearance which is important rather than any change or variation in intensity of the light source, (23 exposures with a cabin of lower intensity and 22 exposures in a cabin of higher intensity). The major advantages of PUVA therapy are, ease of administration or oral instead of topical application, relative speed with which remission is obtained and complete clearance of lesions with no residual tell-tale PUVA treatment has been found effective when other conventional treatments fail. It does not have systemic toxicity since photoactivation of the drug is confined to the skin. The treatment is suited for out-patients who can be kept free of lesions with maintenance treatment.

The initial fear regarding hepatotoxicity of psoralen has been subsequently dispelled by various studies. Oral methoxsalen has been used in the treatment of vitiligo for more than three decades without any serious toxic effects⁸. Orally administered psoralens are rapidly metabolized in the liver and 90% of the drug is excreted within 8–12 hours⁶. This rapid metabolization is the main cause of systemic non-toxicity. Development of cataract and carcinogenesis are two possible potential complications and only a long-term follow-up of PUVA-treated patients will help to determine any possible clinical significance of these. The incidence of carcinoma of skin in Indian patients is recognised to be relatively low.

References

1. Gadgil RB: Photochemotherapy of Psoriasis, A short preliminary communication. *La Medicine en France* 1978, 26: 2.
2. Lerner AB, Denton CR, Fitzpatrick TB: Clinical experimental studies with 8-methoxy-psoralen in vitiligo, *Invest Derm* 1953, 20: 299-314.

3. Fitzpatrick TB, Arndt KA, El Mofty AM, et al: Hydroquinone and psoralens in the therapy of hypermelanosis and Vitiligo, Arch Derm 1966, 93 : 589-600.
4. Parrish JA, Fitzpatrick TB, Tannenbaum L, et al: Photochemotherapy of psoriasis with oral methoxsalen and long wave ultraviolet light, N Engl J Med 1974, 291 : 1207-1210.
5. Wacht H: 8-methoxypsoralen black light therapy; Die verschiedenen Hautkrankheiten Z Hauttraux, 1975, 50 : 683-693.
6. Oberste-Lehn H, Mortazan SAM: Therapeutische Ergebnisse bei der Anwendung von 8-methoxypsoralen (8-MOP) and UVA Z Hautkrank 1975, 50 : 559-571.
7. Wolff K, Fitzpatrick TB, Parrish JA, et al: Photochemotherapy for psoriasis with orally administered methoxsalen, Arch Derm 1976, 112 : 943-949.
8. Fitzpatrick TB, Parrish JA, Pathak MA: Phototherapy of Vitiligo (Idiopathic Leukoderma), Sunlight and Man Edited by Harber LC, Seiji M, Kukita A, et al, University of Tokyo Press, Japan, 1974, p. 783.

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