tromyography were normal. Chest X-ray, barium meal, barium enema, intravenous urogram and mammography were normal. Pelvic examination by a gynaecologist was also normal. Skin biopsy showed a vasculitis with overlying sub-acute dermatitis and direct immunofluorescence demonstrated positive immunofluorescence for IgM and C_3 in superficial vessels and patchily along the dermo-epidermal junction. Muscle biopsy was not performed.

All therapy was stopped and over the next 2 months the rash gradually faded and a feeling of well-being returned; at no time was there a clinically evident weakness of muscles, but 24 h urinary creatine levels remained elevated at 1 140 μmol even after 9 months.

DISCUSSION

This 50-year-old lady presented with the characteristic rash of dermatomyositis and biochemical (but not clinical) evidence of myopathy. Muscle biopsy was not performed in our patient because of the normal electromyograph and lack of muscle symptoms. The diagnosis of myositis in this patient is based on the elevated level of creatine in the urine. Several authors (7, 8) cite this test (urinary creatine) as the best index of disease activity. Serum glutamic oxaloacetic transaminase (SGOT), serum aldolase and serum creatine phosphokinase may also be elevated, but some patients continue to show activity in the presence of normal levels (7). We cannot explain why our patient's urinary creatine is still abnormal, while the dermatological features have resolved. It could be suggested that she has both rheumatoid arthritis and polymyositis. The association between these two disorders has been established (6), but none of the patients in this series had dermatological manifestations.

There has been one previous case report of dermatomyositis occurring during D-Penicillamine therapy (4) though there are several differences between the two cases. The patient concerned received up to five times the daily dosage taken by our patient, she developed a high titre of antinuclear factor and required systemic therapy with Prednisolone to induce a remission of dermatomyositis.

We suggest that our patient had both rheumatoid arthritis and dermatomyositis and that, because of the rapid remission of the rash on withdrawal of D-Penicillamine, the drug was the causative factor, especially as investigations for neoplasia and an 18-month follow-up have revealed no other associated conditions.

REFERENCES

1. Bettendorf, V. & Neuhaus, R.: Penicillamine induced polymyositis. Dtsch Med Wochenschr *99:* 2522, 1974.
2. Bucknall, R. C., Dixon, A. St. J., Glick, E. N., Woodland, J. & Zutshi, D. W.: Myasthenia gravis associated with penicillamine treatment for rheumatoid arthritis. Br Med J *i:* 600, 1975.
3. Day, A. T. & Golding, J. R.: Hazards of Penicillamine therapy in the treatment of rheumatoid arthritis. Postgrad Med J *50:* Suppl. 71, 1974.
4. Fernandes, C., Swinson, D. R. & Hamilton, E. B. D.: Dermatomyositis complicating Penicillamine treatment. Ann Rheum Dis *36:* 94, 1977.
5. Huskisson, E. C.: Penicillamine and the rheumatologist: A review. Pharmatherapeutica *1:* 24, 1976.
6. Pitkeathley, D. A. & Coomes, E. N.: Polymyositis in rheumatoid arthritis. Ann Rheum Dis *25:* 127, 1966.
7. Rowell, N. R.: Dermatomysitis. *In* Textbook of Dermatology (ed. A. J. Rook, D. Wilkinson & J. Ebling), 2nd edn. 1 129 pp. Blackwell Publications, Oxford, 1972.
8. Vignos, P. J. Jr & Goldwyn, J.: Evaluation of laboratory tests in diagnosis and management of polymyositis. Am J Med Sci *263:* 291, 1972.

Local Photochemotherapy in Nodular Prurigo

Niilo Väätäinen, Matti Hannuksela and Jaakko Karvonen

Department of Dermatology, University Central Hospital, Oulu, Finland

Received June 26, 1979

Abstract. Fifteen patients with nodular prurigo were treated with a trioxsalen bath (50 mg/150 l of water) and UVA given in an ordinary PUVA cabin. Good results were observed in 8 and moderate in 7 patients in the initial phase. The result was good or excellent in 13 of the 15 patients during maintenance treatment. The good results are promising in the treatment of this chronic and otherwise therapy-resistant disease.

Key words: Nodular prurigo; Itching; Photochemotherapy; Trioxsalen; PUVA

Nodular prurigo (syn. Prurigo nodularis Hyde, Lichen corneus obtusus) is seen most often in middle-aged women. The exact cause and mechanism of this fairly rare disease are unknown. It may be some kind of cutaneous neurosis with intense itch-

Table 1. *Results of photochemotherapy in 15 patients with nodular prurigo*

Patient	Age	Sex	Duration of disease (years)	Initial treatment		Maintenance treatment		
				No. of sessions	Result[a]	Duration (months)	Frequency of treatment (sessions/weeks)[b]	Result[a]
1	57	♀	1	30	Good	8	2–4/4	Moderate
2	67	♂	4	26	Good	2	2/3	Good
3	75	♂	40	16	Moderate	4	4/4	Good
4	17	♀	2	13	Moderate	13	2–4/4	Good
5	63	♀	1	20	Good	6	2/4	Excellent
6	72	♂	3	37	Good	9	2/4–8	Excellent
7	63	♀	3	26	Moderate	6	4/4	Good
8	25	♂	4	28	Moderate	8	2/4	Excellent
9	55	♂	8	7	Moderate	2	2–3/4	Good
10	23	♀	2	9	Moderate	9	2/4	Good
11	66	♀	12	25	Good	6	1/3	Moderate
12	66	♀	2	14	Moderate	1	2/3	Good
13	54	♀	2	15	Good	2	2/8	Good
14	65	♀	6	11	Good	3	2/4	Excellent
15	60	♂	6	12	Good	1	5/4	Good

[a] Poor: under 30%, Moderate: 30–60%, Good: 60–90%, Excellent: 90–100%.
[b] 2/3 means one treatment episode of two sessions every third week.

ing leading to continuous scratching, teasing and tugging of the skin.

Treatment of nodular prurigo has been very limited. Local corticosteroids as ointments or as intralesional injections have been most beneficial (7) but relapses are very frequent. Tranquillizers and psychiatric assessment have therefore also been used.

The introduction of PUVA therapy for the treatment of chronic skin diseases responding poorly to 'classical' forms of treatment has changed the prognosis for many of them. We used local photochemotherapy in 15 patients with nodular prurigo over a 14-month period. The initial results were good and this therapy would also seem to have altered the overall prognosis for this troublesome disease.

PATIENTS AND METHODS

Over a 14-month period between March 1978 and May 1979 local photochemotherapy was initiated in 15 patients with nodular prurigo. Nine of the patients were women (mean age 53 yrs, range 17–66 yrs) and 6 were men (mean age 59 yrs, range 25–75 yrs). The duration of the disease varied from one year to 40 years (mean 6 yrs). Four patients had previously been hospitalized at least twice, whereas 5 patients were on the ward for the first time. All the patients had been treated locally with potent corticosteroids, 3 of them with intralesional corticoids without any notable effect.

Local PUVA therapy was given as described earlier (4). Fifty mg of trioxsalen (Fermion, Finland) in 20 ml of ethanol was added to 150 l of warm (37°C) water. The patients bathed for 10 minutes. UVA was given immediately after the bath in a stand-up PUVA cabin (PUVA 22, Astra-Sjuco, Helsinki) giving about 12 mW/cm² of UVA. The initial dose was 0.12 J/cm² in 6 patients and 0.24 J/cm² in 9. The patients were all treated daily, and the dose was increased every third day by about 50%, i.e. from 0.12 to 0.18, 0.24, 0.36, 0.54, 0.72 J, etc., unless burning or other untoward side effects were noted. The treatment was continued until beneficial results were seen, which took 1–4 weeks. Thereafter the patients were kept on maintenance therapy for an average of 5 months (1–13 months). The maintenance therapy was given at 1–2 month intervals, on 2–4 consecutive days each time. The maintenance dose was approximately the dose achieved during the initial treatment phase.

The total dose of UVA during the initial treatment phase was on average 14.6 J/cm² and during the maintenance therapy 12.2 J/cm² (maximum 29.3 J/cm² in case 4).

Routine blood and urine tests and serum alanine amino transferase (S-ALAT) were determined before the treatment and at 2–4 week intervals during the initial therapy as well as at 1–2 month intervals during the maintenance therapy.

RESULTS

An average of 3 weeks was needed to achieve moderate or good results during the initial treatment

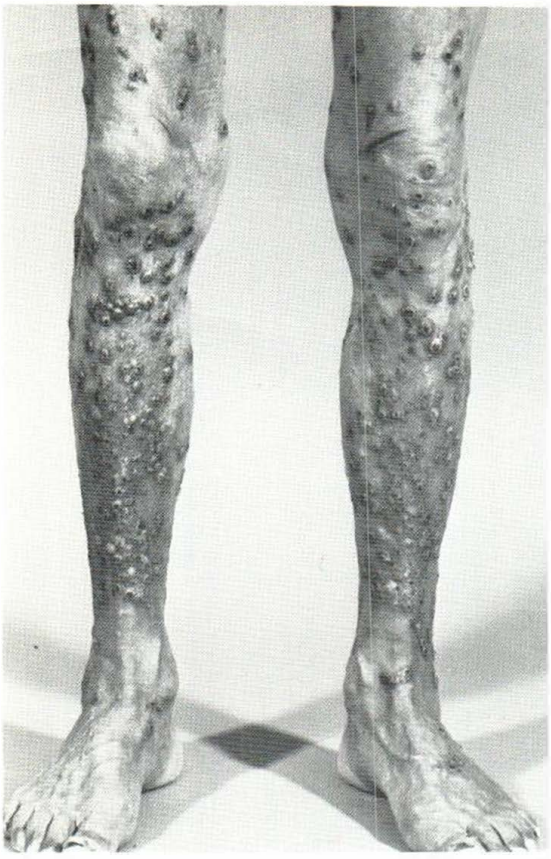

Fig. 1. Legs of a 72-year-old male (case 6) with severe nodular prurigo. Intense itching with fresh excoriations on almost all nodules.

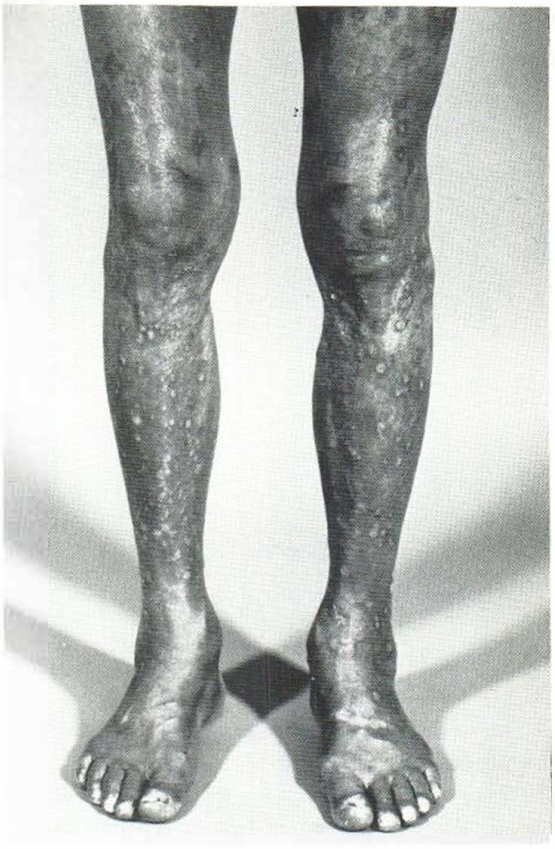

Fig. 2. Same patient as in Fig. 1 after a treatment of 4 months. Only depigmented maculae are seen on the sites of the previous nodules. No itching and no excoriations. Rather pronounced PUVA tanning.

phase (Table I). None of the 15 patients failed to react to this therapy. The clinical healing took place in two phases. Within 4–6 days, itching decreased markedly or disappeared completely. The induration also regressed noticeably during the first week but to a much lesser extent during the following 1–2 weeks. The lesions continued to heal during the maintenance therapy (Figs. 1, 2). Once an excellent result had been achieved, the nodules grew again in only 2 cases. These patients (cases 1 and 11) complained of increasing itching towards the end of the interval between maintenance therapies.

So far, therapy has been discontinued in 4 cases. One of them (case 11) has stopped the treatment after 6 months of maintenance therapy because of the long distance between the hospital and her home. In 3 other cases (3, 6 and 7) the result during the maintenance therapy was so good that further treatment was considered unnecessary. The follow-up period is, however, so short (only 2½–4 months) that no conclusions about the long-term effect of photochemotherapy can be drawn.

Undesirable side effects were encountered in 7 patients during the initial treatment, grade I burning in 6 cases and blistering in one. During the maintenance therapy the corresponding figures were 4 cases of grade I burning and one case of blistering. All these side effects disappeared in 1–3 days, and the treatment was continued. In laboratory tests, no pathological changes possibly due to the photochemotherapy were found. No other side effects, local or systemic, were seen, either.

DISCUSSION

Photochemotherapy has been used in some diseases in which itching is one of the most disturbing symptoms, e.g. in lichen planus (6) and in atopic dermatitis (3, 5) with good results in both complaints. Since itching is the main symptom in nodular prurigo as well, we decided to try photochemotherapy for its treatment. We tried trioxsalen bath instead of systemic methoxsalen because trioxsalen bath plus UVA has proved effective and safe in the treatment of psoriasis (1, 4).

Our results during both initial and maintenance therapy were unexpectedly good. The mode of action of the therapy may be triphasic. First of all, photochemotherapy blocks the rapid turnover in epidermal cells. This reduction leads to a reduction of the pseudoepitheliomatotic hyperplasia of the epidermis. The treatment also reduces the numbers of inflammatory cells in the dermis. The main effect of photochemotherapy in nodular prurigo seems to consist in breaking the vicious circle of itching and scratching.

Local application of the photosensitizing drug is more advisable than the systemic mode because it is obviously only with difficulty that the drug reaches the lesions when given perorally. The pharmacological basis of the beneficial effect remains obscure. The mechanism may be of the same type as that seen in the treatment of pruritus in uraemia with UVB (2), whatever it might be.

REFERENCES

1. Fischer, T. & Alsins, J.: Treatment of psoriasis with trioxsalen baths and dysprosium lamps. Acta Dermatovener (Stockholm) *56:* 383, 1976.
2. Gilchrest, B. A., Rowe, J. W., Brown, R. S., Steinman, T. I. & Arndt, K. A.: Relief of uremic pruritus with ultraviolet phototherapy. N Engl J Med *297:* 136, 1977.
3. Gschnait, F., Hönigsmann, H., Konrad, K., Fritsch, P. & Wolff, K.: Photochemotherapie (PUVA) bei Neurodermatitis. Z Hautkr *52:* 1219, 1977.
4. Hannuksela, M. & Karvonen, J.: Trioxsalen bath plus UVA effective and safe in the treatment of psoriasis. Br J Dermatol *99:* 703, 1978.
5. Morison, W. L., Parrish, J. A. & Fitzpatrick, T. B.: Oral psoralen photochemotherapy of atopic eczema. Br J Dermatol *98:* 25, 1978.
6. Ortonne, J. P., Thivolet, J. & Sannwald, C.: Oral photochemotherapy in the treatment of lichen planus (LP). Br J Dermatol *99:* 77, 1978.
7. Rook, A. & Wilkinson, D. S.: Eczema, lichen simplex and prurigo. *In* Textbook of Dermatology, pp. 256–294 (ed. A. Rook, D. S. Wilkinson & F. J. G. Ebling). Blackwell, Oxford, 1972.

Induction of Delayed-Type Sensitivity to Leishmania Parasite in a Case of Leishmaniasis Cutanea Diffusa with BCG and Cord-Factor (Trehalose-6-6′ Dimycolate)

Haim A. Cohen

Department of Dermatology and Venereology of the Hadassah University Hospital, Jerusalem, Israel

Received March 7, 1979

Abstract. The delayed hypersensitivity against the leishmania parasite was restored to a patient who had suffered from diffuse cutaneous leishmaniasis (DCL) for 26 years, by the application of an ointment containing heat-killed and lyophilized BCG and cord-factor (trehalose-6-6′-dimycolate) after stripping the affected and adjacent areas with scotch-tape.

A 46-year-old Patient, suffering from leishmaniasis lesions on the nose, cheeks and upper lip which appeared 26 years ago, was hospitalized in our department. According to his history, 11 years before the appearance of these lesions he suffered from leishmaniasis nodosa localized to the lower and flexor side of his right arm, where a scar can be seen. During these 26 years, he was treated with all known therapeutic modalities, including five surgical interventions, with no beneficial effect; the lesions merely reappeared and multiplied (Fig. 2).

In the repeated microscopical examinations,

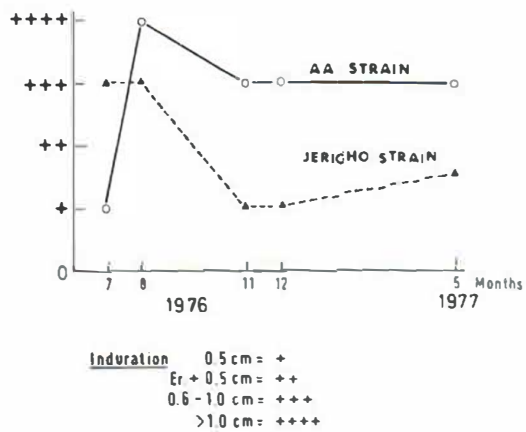

Fig. 1. Leishmanin reaction.