the liver and seems to have no known cross reactions with other regularly used medicaments. (1)

Although methaqualone has been found to cause a multitude of side effects ranging from polyneuropathy to epistaxis (2) and irregular menses (3), cutaneous reactions are rarely encountered. Our patient is the first reported person to have developed erythema multiforme while on the drug. The manufacturer knows of two additional, similar cases, both undocumented (4).

Drug abusers are recognized for using a wide variety of habituating chemicals. Our patients had drug-induced hepatitis 8 months ago and a similar dermatologic problem from "lude and coke" 2 years before. This history, coupled with the patient's identification of the labelling 714, makes a strong case for methaqualone. Fellner agrees with us that these facts clearly implicate the drug in the production of erythema multiforme (5).

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Ethambutol-induced Lichenoid Eruption

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Abstract. The tuberculostatic drug ethambutol is an infrequent skin offender. A lichenoid skin eruption restricted to the light-exposed areas in a 67-year-old male was proved by withdrawal and challenge to be caused by ethambutol. Patch tests with ethambutol 0.1%, 0.5% and 1% in watery solution were negative.

Key words: Lichenoid skin eruption; Drug eruption; Ethambutol

In 1961 ethambutol or myambutol, the d-isomer of ethylene-di-imino-di-one-butanoldihydrochloride was found to have a pronounced tuberculostatic activity. The drug has no effect on other bacteria and suppresses the growth of isoniazide- and streptomycin-resistant tubercule bacilli. The precise mechanism for its activity is unknown (5).

Ethambutol is administered orally and is usually well tolerated. Cutaneous side effects are infrequently reported in the literature.

CASE REPORT

A 67-year-old male was admitted for dermatological evaluation, when, 2 months after initiation of tuberculostatic treatment with isoniacid 0.1 g×3, ethambutol 400 mg ×3 and rifampicin 450 mg a day for pulmonary cavernous tubervulosis, he developed a widespread skin eruption.

No family history of skin deseases was reported, but for many decades the patient himself had had yellowish discoloured and thickened nails on fingers and toes and a persistent desquamation of the palms and soles, clinically suggestive of psoriasis. His light tolerance was hitherto normal.

The present skin eruption was moderately itchy, and restricted to the light-exposed areas with a quite sharp horizontal demarcation on the upper thigh. The lesional skin in most of the affected areas was characterized by hyperpigmentation and macular and reticular brownish-red desquamating elements without or with very slight infiltration.

On the backs of his hands and fingers and on the anterior aspects of the lower legs, lichenoid, waxy, bluish-red, partly confluent papules were present (Fig. 1).

Withdrawal of isoniacid did not result in any improvement of the skin condition. However, when ethambutol and rifampicin simultaneously were subsequently withdrawn as well, a remarkable change for the better took place within the course of a week.

In order to establish the identity of the offending drug conclusively the patient was challenged, first uneventfully with rifampicin, subsequently with ethambutol. Eight hours after ethambutol had been given the skin flared and drug fever arose.

No symptoms of alterations in his sight were recognized in the course of the skin diesease. Routine laboratory investigations, including eosinophils, immunoglobulins and complement C_2 and C_4, were within normal limits.

The histological findings in the elements from the dorsum of a finger and from the upper arm were consistent with drug-induced lichenoid eruption (Fig. 2).

Direct immunofluorescence investigation of lesional skin revealed colloid bodies, particularly containing IgM

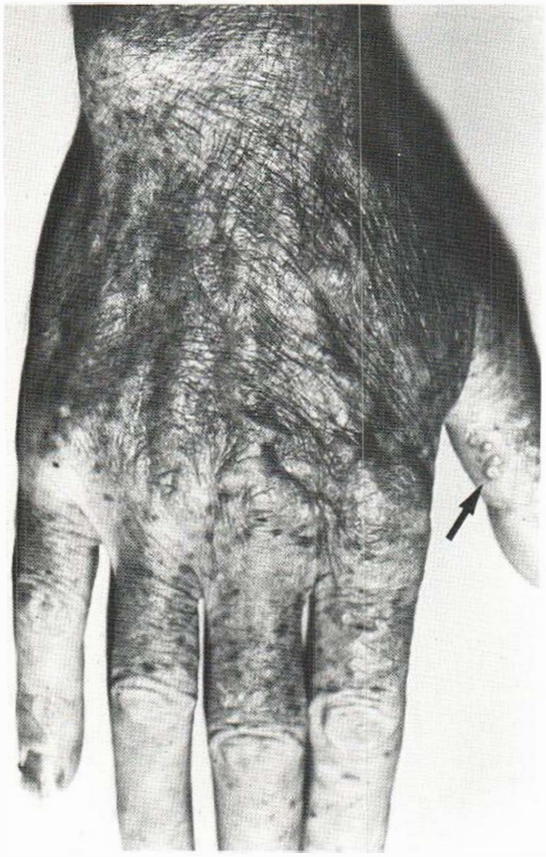

Fig. 1. Drug-induced lichen planus of the hand. Hyperpigmentation is pronounced; lichenoid papules are indicated by arrow.

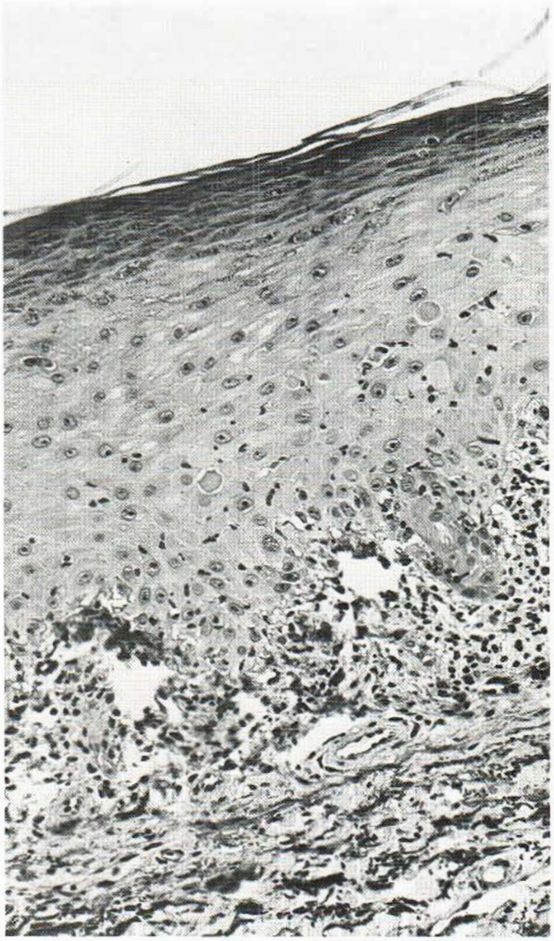

Fig. 2. Skin biopsy from lesional skin showing hypergranulosis, achanthosis, colloid bodies, degeneration of the basal layer and a cell infiltration at the dermo-epidermal junction consisting of lymphocytes, histiocytes, a few plasma cells and eosinophils. The eosinophils especially characterize the lesion as drug-induced.

and a sparse granular deposite of complement factor C_3 as well as a broad irregular fibrin/fibrinogen band below the basement membrane. No deposits were found in the vessels.

Patch tests with ethambuol 0.1%, 0.5% and 1% in a watery solution proved negative, as in two control persons.

DISCUSSION

The most important side effects of ethambutol are optic neuritis, sight impairment and loss of ability to perceive the colour green. Side effects involving the skin are infrequent (5). From 1968 to 1977 108 skin reactions have been reported to the WHO as being caused by ethambutol. Eight cases of hair loss were included, while urticaria, erythema multiforme, angio-oedema, hyperhidrosis, skin striae, bullous eruption and dermatitis exfoliativa each contributed with one, two or three cases. One of the two cases of dermatitis exfoliativa was lethal. More than half of the cases were reported as "rash". "Rash" and itching together counted for 70% per cent of the cutaneous side effects (3).

In the case presented, ethambutol was proved to be the causative agent for the lichenoid skin eruption as challenge provoked a reappearance of the skin symptoms, while regression had occurred on withdrawal.

The clinical morphology, with skin changes restricted to the light-exposed areas with hyperpigmentation and desquamation, together with the histological and direct immunofluorescence findings

are compatible with previously reported drug-induced lichenoid eruptions (1, 2, 4).

Thus ethambutol can be added to the list of drugs capable of provoking lichen planus-like eruptions.

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Pyriderm® Shampoo in the Treatment of *Pediculosis capitis*

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Abstract. 112 patients with head lice were treated with a shampoo containing pyrethrins. All were treated twice with an interval of one week. At examination immediately before the second treatment, 6 patients had small, newly hatched lice, and one patient had both small and mature lice—probably due to reinfestation. This patient was lice-free after the third treatment, the other patients after the second treatment. It is concluded that pyrethrins are highly effective against head lice and have the advantages of a low toxicity to mammals and a short contact time.

Key words: Pediculosis capitis; Pyrethrins

During the past 30 years clophenothane has been the most common treatment for head lice infestation in Denmark. Because of an increasing number of treatment failures, possibly due to the development of resistance to clophenothane, we had to consider a change of treatment. Lindane (gamma benzene hexachloride) was considered but rejected. It is chemically related to clophenothane and cross resistance between the two compounds may exist. We therefore resumed an older treatment schedule with an extract of quassia, which gave excellent results (4). However, the slow pediculocide effect of quassia made this treatment time-consuming and less suitable for home treatment.

Pyrethrum has been widely used as an insecticide for more than 50 years and before that even as an antihelminthic for humans (6). For mammals, pyrethrum seems to be one of the safest insecticides with a peroral LD_{50} of 820–1 500 mg/kg body weight (6). No studies on the percutaneous absorption are available, but considering the low concentrations necessary for topical treatment, this problem seems to be negligible. In nature, pyrethrum is easily decomposed to inactive substances (2, 3).

In 1978 Pyriderm® shampoo containing pyrethrin, which is an extract of pyrethrum, was introduced in Denmark. In the following we report the results of this preparation on patients with head lice.

CHEMISTRY

By extraction of *Chrysanthemum cinerariaefolium* a solution of pyrethroids is obtained along with waxes and pigments. This solution is allergenic due to pyrethrosin, a sesquiterpene lactone, which causes contact dermatitis and often shows cross reactions with a similar substance in ragweed (1, 5, 7). By further procedures pyrethrosin can be removed, leaving purified, non-allergenic "pyrethrin". This contains 6 esters with insecticidal properties (cinerin I, jasmolin I, pyrethrin I, cinerin II, jasmolin II and pyrethrin II).

Since 1950 synthetic pyrethrins have been available. They act as contact poisons and cause rapid paralysis and death of the insects after a few minutes (6). Pyriderm® shampoo contains 0.15% pyrethrin I and II, perfume, and 1.65% piperonylbutoxide, which increases the effect of the pyrethrins, presumably by a restraining effect on the decomposition of the pyrethrins in the insects (6).

MATERIAL AND METHODS

During the period 1.10.78–31.12.79 a total of 160 patients with live live and/or eggs were treated with Pyriderm®. 48