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Provocation of Porphyria Cutanea Tarda by KUVA-therapy of Vitiligo

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Therapy with khellin and UVA irradiation (KUVA) is a therapeutic approach to vitiligo. Little is known about the photobiological properties of khellin and its long-term side-effects after prolonged administration. A 47-year-old woman suffering from acral vitiligo since the age of 3 is reported, who developed blisters on hands and fingers during KUVA-therapy. Laboratory findings were consistent with hereditary porphyria cutanea tarda. Electron microscopic examination of a blister revealed clefting below the basement membrane. It is proposed that khellin in some way provoked the porphyria cutanea tarda in this patient. ***Key words: khellin; UVA irradiation.***

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Therapeutic approaches to vitiligo with a new photochemotherapy characterized by oral administration of the furochromone khellin, which has been used as a coronary vasodilatator since 1940 (1), were reported in 1982 by Abdel-Fattah et al. (2). In a double-blind clinical study, khellin was orally administered to 30 vitiligo patients for 4 months, with subsequent exposure to natural sunlight. At the end of the treatment, 5 patients out of 30 (16.6%) repigmented 90–100%; 7 patients (23.3%) repigmented 50–60% of the vitiliginous areas treated; 11 patients (36.6%) repigmented in an area of 25% or less. Only 7 patients (23.3%) showed no response. No side-effects were perceived in any of the patients. In 1988, Ortel et al. (3) described successful therapy of vitiligo with khellin and UVA (KUVA-therapy). The authors stated that KUVA might be as effective as PUVA in the treatment of vitiligo. An increase of liver enzyme levels was reported as a side-effect in 25% of their patients. In 1989, Duschet et al. (4) observed a dramatic increase of liver transaminase levels in one woman after systemic and topical administration of KUVA. As a consequence, Hönigsmann et al. (5) agree that liver enzyme monitoring should be performed during KUVA-therapy and if values are increased, therapy should be stopped.

The efficacy of treatment of vitiligo with topical or systemic khellin and UVA is well documented (6–8). We report on a patient who developed porphyria cutanea tarda (Pct) and rise of transaminase levels during KUVA-therapy. These data show a previously unreported side-effect of the non-psoralen compound khellin in the treatment of vitiligo.

CASE REPORT

A 47-year-old white woman, skin type III, had suffered from vitiligo since she was 3 years old. She had an acral distribution of depigmented areas, involving hands, feet, face and hips. Therapy was started with khellin 100 mg 2.5 h before UVA irradiation (10 J/cm^2) four times a week in September 1988. No other diseases were known when the therapy started. Routine laboratory examinations including blood cell count, liver transaminases and kreatinin yielded results within normal range. Hepatitis screening was negative for hepatitis B and C. The patient did not take any other medication (e.g. estrogens, iron). There was no heavy alcohol intake. During therapy repeated laboratory controls showed no abnormalities. The patient exhibited a cosmetically satisfying result, with about 70% repigmentation of the face and hips. In August 1989, an isolated increase of γ-GT (132 U/l) was detected, with the other liver transaminases being in the normal range, and blistering on the back of the hands and fingers was seen in October 1989 (Fig. 1).

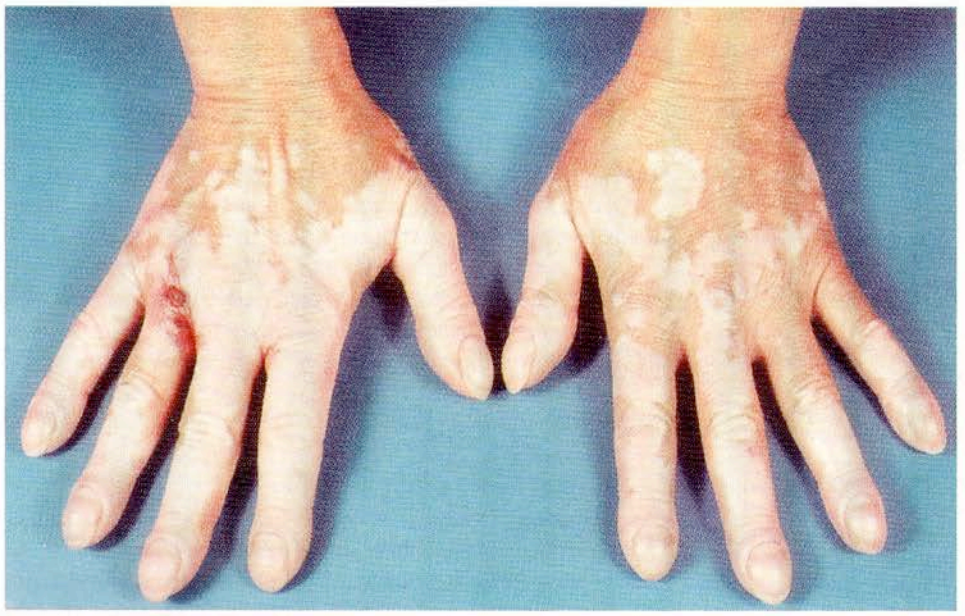

Fig. 1. Blistering on the back of the hands and fingers.

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Therefore, KUVA-therapy was stopped. Total urine porphyrin exceeded normal values sevenfold (706 ng/l). Liver enzymes were normal 2 days after KUVA-therapy was stopped. The patient had remarkably increased hair growth on both cheeks and light brown urine. Deficiency of the uroporphyrinogen-decarboxylase revealed hereditary Pct. Katabolisized uroporphyrinogen was 0.12 nmol/mg Hb/h (normal: >1.35 nmol/mg Hb/h). Electron microscopy from a blister of the hands revealed clefting below the basement membrane. There was normalization of the blistering and total porphyrin excretion 6 months after cessation of KUVA-therapy. No specific Pct treatment was given.

DISCUSSION

Khellin is a substance isolated from the fruits of *Ammi majus* and *Ammi visnaga* (3, 9). It has some structural similarities with 8-methoxypsoralen (8-MOP). Little is known about the photobiological properties of khellin and its long-term side-effects after prolonged administration. Compared with 8-MOP khellin shows much less activity in phototoxicity tests in bacterial systems and genotoxicity tests in Chinese hamster ovary cells (10). It predominantly forms monofunctional photoadducts with cellular DNA.

The hepatotoxic side-effect of systemic application of khellin in otherwise healthy patients is well known (4). In addition, hepatotoxicity after topical application of khellin in a single patient was reported by Duschet et al. (4), but this still needs to be investigated carefully. Otherwise, khellin was used in daily doses of up to 300 mg for several years in the long-term treatment of angina pectoris without any hepatotoxic effect (1). The elevation of liver transaminase levels usually occurs within the first 2 months of treatment (3). In patients in whom no elevation of liver enzymes is seen, values remain normal up to more than 2 years of treatment. The pharmacologic pathway and induction of liver toxicity is not known, but it may be proposed that khellin induces P 450 isoenzymes. This hepatotoxic effect may have provoked the hereditary Pct in our patient.

In conclusion, we propose looking for Pct in the patient's own history and family history before starting KUVA-therapy. Further investigations are necessary to identify the short- and long-term side-effects of khellin.

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