

Successful Treatment of Severe Foot Dermatitis by Iontophoresis and Local Bath-PUVA

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Sir,

Dermatitis of the feet can be difficult to treat. Therapy-resistant foot dermatitis is not limited to a particular type of dermatitis; it is encountered in allergic contact eczema, atopic eczema and endogenous forms. The key principle in the management of allergic contact dermatitis is avoidance of the relevant allergen; for example, chromate or rubber substances in the shoes. However, wearing allergen-free shoes does not always result in remission of the dermatitis, which may have a notoriously chronic course. This chronic course can be explained by an occlusive effect from the shoes and sweating activity. Sweating may negatively influence dermatitis severity, especially in dyshidrotic, vesicular forms of dermatitis. Tap water iontophoresis (TWI) has been used successfully in palmoplantar hyperhidrosis (1). TWI had a clear effect on itching and vesicles of hand eczema, but not on erythema and desquamation (2). A second study on dermatitis has shown a beneficial effect of TWI on the relapse-free interval, and a slightly faster clearing in dyshidrotic palmoplantar dermatitis (3). Another type of treatment of hand and foot dermatitis is local bath-PUVA, which has been found to be an effective and safe treatment modality for this indication (4, 5). In severe cases, however, the success rate of local bath-PUVA in our hands was not as high as stated in the literature.

We describe four patients with hyperhidrosis and severe dermatitis of the feet. In the first two, TWI was given and had a good effect on sweating, but insufficient effect on dermatitis activity. It was therefore decided to combine TWI with local bath-PUVA in these and the next two patients.

MATERIALS AND METHODS

Four patients with long-standing severe dermatitis of the feet, all unresponsive to clobetasol propionate ointment, were treated. Patient no. 1 was allergic to chromate and N-isopropyl-N-phenyl-PPD (Table I). Allergen avoidance had no effect. Patient no. 2 had dermatitis of the soles and the palms, and to a varying extent of the arms and legs. He was treated during 2 periods (in 2000 and 2002). Patient no. 3 had dermatitis influenced by vitamin B12 injections. Patient no. 4 had severe vesicular palmoplantar dermatitis necessitating oral therapy with prednisolone 15 mg daily and azathioprine 100 mg daily. All except patient no. 4 were smokers. Duration of dermatitis and atopy status are given in Table I. All patients suffered from hyperhidrosis of the feet.

TWI was given 3 times weekly for 10 min using Phyaction 796 (Uniphy, Eindhoven, Netherlands). The strength of the direct current was slowly increased, guided by the occurrence of tingling sensations. The maximal strength was 16 mA. Each time, TWI was immediately followed by local bath-PUVA, with 8-methoxypsoralen solution of 3 mg/l. After soaking for 10 min, the soles (and palms) were exposed to UVA radiation from a PUVA 180 unit (Waldmann, Villingen-Schwenningen, Germany) equipped with Sylvania F15W/T8

Table I. Characteristics of the patients and results of combined iontophoresis and local bath-PUVA treatment

Patient sex	Birth year	Allergy	Duration (years)	Atopy	Smoking	Treatment duration (weeks)	Effect
1/F	1961	Chromate, N-isopropyl-N-Phenyl-PPD	1.5	–	+	8	Cleared
2/M	1964	–	12	–	+	9 10*	Much improved Worsened
3/F	1977	Fragrance, Vit. B12	0.5	+	+	8	Much improved
4/M	1980	–	5	–	–	10	Much improved

*Treatment repeated after 2 years.

tubes (Waldmann). The initial dose was 0.08–0.2 J/cm², depending on skin type. The dose was increased every time by increments of 0.04–0.2 J/cm², depending on skin type, until a maximum of 4.5–43 J/cm². The effect of the therapy was evaluated by means of a 4-point scale: cleared, much improved, somewhat improved and unchanged/worsened. "Cleared" denoted the absence of any clinical signs and subjective symptoms. "Much improved" meant an excellent response, but some infiltration and/or desquamation persisted. "Somewhat improved" meant a substantial, easily recognized, improvement.

RESULTS

The use of clobetasol was continued during the TWI/local bath-PUVA treatment. This could be tapered off and stopped in all instances, except for patient no. 2, during the second treatment period. In 1 out of 5 treatments there was a clearing of the dermatitis, and in 3 much

improvement was observed (Table I). In patient no. 4 (Fig. 1) this improvement made it possible to stop the prednisolone and azathioprine. These successful effects lasted more than 3 months.

DISCUSSION

The action mechanism of TWI is probably based on a postsynaptic functional disturbance of sweat gland secretion (1). Moreover, it has been hypothesized that TWI interferes with neuropeptides and cytokines in the sweat glands, which may be responsible for the improvement of the dermatitis. In hyperhidrotic dermatitis patients, one assumes a negative influence of hyperhidrosis on dermatitis activity, and when this influence is eliminated it may be expected that the dermatitis will improve. PUVA therapy can reduce the number and function of inflammatory cell types such as Langerhans' cells. Combining bath-PUVA with iontophoresis yields a strong therapeutic tool in the management of severe foot dermatitis.

It is not possible to draw conclusions on the relative contribution of either iontophoresis or bath-PUVA from our observations. Nor is it known to what extent patients with severe foot dermatitis without hyperhidrosis will benefit from this therapy. Finally, the possibility of a placebo effect should be ruled out. An attempt to answer these questions is being planned in a controlled study.

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Fig. 1. Feet of patient no. 4 before (a) and after (b) therapy.