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Contact hypersensitivity in patients with psoriasis

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Psoriasis and contact dermatitis are common inflammatory skin diseases characterized by epithelial alterations and deviation in T cell immunity (1). Their prevalence in the general population is 1–3% and 15–20%, respectively (2). In psoriasis patients, keratinocytes show a higher proliferation rate and are less susceptible to apoptosis, while in allergic contact dermatitis (ACD) patients apoptosis is induced by T cells (1). Because of these antagonistic hallmarks, the extent to which patients with psoriasis develop ACD is unclear (1). Palmoplantar involvement in psoriasis patients is common, the frequency estimated to be 2–21.1% (3).

The aims of this study were to determine the frequency of contact sensitization in patients with psoriasis who had palmar and/or plantar involvement, and to determine whether the palmoplantar involvement in patients with psoriasis is a manifestation of psoriasis or the expression of current or previous ACD.

Materials and Methods

We performed patch tests with the baseline series (Imunološki zavod, Zagreb, Croatia; Chemotechnique Diagnostics, Vellinge, Sweden) on 88 patients, 47 males and 41 females, suffering from psoriasis with palmar and/or plantar involvement. Besides palmar and/or plantar involvement, all patients had psoriatic lesions elsewhere on the body, namely on the extensor surfaces of the knees, elbows, knees, scalp, and trunk. Patients had mild to moderate psoriasis, with a psoriasis area and severity index ranging from 3 to 20. The mean age was 48.8 years. The control group consisted of 61

age-matched and sex-matched patients with vulgar psoriasis without palmar or plantar involvement. All patch tests were read after 48 and 72 h. Patients in both groups had been suffering from psoriasis for > 2 years.

Results

Of 88 patients with palmoplantar psoriasis, 26 (29.5%) had positive patch test reactions to one or more allergens in the baseline series. In the control group of 61 patients with psoriasis but without palmar and/or plantar involvement, only 4 (6.56%) patients had positive reactions (odds ratio: 5.98; 95% confidence interval: 1.96–18.2).

The most common allergen in the study group (patients with palmoplantar involvement) was potassium dichromate, followed by cobalt chloride, carba mix, coal tar, thimerosal, nickel sulfate, benzocaine, methylisothiazolinone (MI)/methylchlorisothiazolinone (MCI), and fragrance mix I (Table 1). In the control group, 2 patients had positive patch test reactions to potassium dichromate, and there were positive reactions to fragrance mix I, cobalt chloride and benzocaine in 1 patient each.

Contact allergy to coal tar was of current relevance in 6 of 8 patients with palmoplantar psoriasis, as it was found in shampoos, lotions, ointments or gels that patients were using. Contact allergies to neomycin sulfate, phenylenediamine and *Myroxylon pereirae* (balsam of Peru) were of past relevance, as patients reported having used different topical products containing these ingredients in the past. Five of 6 nickel sulfate-positive patients and 6 of 9 cobalt chloride-positive patients reported rashes from costume jewellery, watchbands and buttons, which were not relevant to their present skin lesions. In 1 patient, contact allergy to nickel sulfate was of current relevance, as the patient was a cashier working with coins. At the follow-up visit, after 3 months, the patient's palmar lesions improved significantly. She reported having changed her job. Occupational relevance

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Table 1. The patch test results obtained with the baseline series* in patients with psoriasis with and without palmoplantar involvement

Allergen		Number of positive patch test reactions	
		Psoriasis with palmoplantar involvement (N = 88), n (%)	Psoriasis without palmoplantar involvement (N = 61), n (%)
1	Potassium dichromate (0.5% pet.)	10 (11)	2 (3)
2	Cobalt(II) chloride hexahydrate (1% pet.)	9 (10)	1 (2)
3	Nickel(II) sulfate hexahydrate (5% pet.)	6 (7)	–
4	Fragrance mix I (8% pet.)	5 (6)	1 (2)
5	Epoxy resin (1% pet.)	1 (1)	–
6	p-Phenylenediamine (1% pet.)	4 (5)	–
7	Myroxylon pereiarae (balsam of Peru) (25% pet.)	2 (2)	–
8	N-isopropyl-N-phenyl-4-phenylenediamine (0.1% pet.)	2 (2)	–
9	Mercapto mix (2% pet.)	4 (5)	–
10	Thiuram mix (1% pet.)	3 (3)	–
11	Carba mix (3% pet.)	8 (9)	–
12	Paraben mix (16% pet.)	2 (2)	–
13	Coal tar (5% pet.)	8 (9)	–
14	Neomycin sulfate (20% pet.)	1 (1)	–
15	Benzocaine (5% pet.)	6 (7)	1 (2)
16	Colophonium (20% pet.)	1 (1)	–
17	Formaldehyde (2% aq.)	1 (1)	–
18	Thimerosal (0.1% pet.)	7 (8)	–
19	Phenyl mercuric acetate (0.01% aq.)	3 (3)	–
20	Sesquiterpene lactone mix (0.1% pet.)	–	–
21	Clioquinol (5% pet.)	–	–
22	Quaternium-15 (1% pet.)	2 (2)	–
23	2-Methoxy-6-n-pentyl-4-benzoquinone (0.01% pet.)	–	–
24	Budesonide (0.01% pet.)	–	–
25	Tixocortol-21-pivalate (0.1% pet.)	–	–
26	Methylisothiazolinone/methylchlorisothiazolinone (0.01% aq.)	6 (7)	–
27	Fragrance mix II (14% pet.)	–	–
28	Methylisothiazolinone (0.2% aq.)	–	–
29	Methyldibromo glutaronitrile (0.5% pet.)	–	–
30	Lanolin alcohol (30% pet.)	–	–

*Baseline series used by the Department of Dermatology and Venereology, University Hospital Centre Zagreb, University of Zagreb School of Medicine, Zagreb, Croatia.

was found in 10 other patients: 3 working in the leather industry (positive reactions to potassium dichromate), 4 working in the tyre industry [positive reactions to N-isopropyl-N-phenyl-4-phenylenediamine (IPPD), mercapto mix, thiuram mix, and carba mix], 2 cleaners (positive reactions to MCI/MI, fragrance mix I, thiuram mix, and IPPD) and 1 carpenter (positive reaction to epoxy resin). In patients with psoriasis without palmoplantar involvement, neither occupational nor other present relevance was found in the 4 positive patients.

The results of our study show a significantly higher frequency of contact hypersensitivity in patients with palmoplantar psoriasis than in psoriasis patients without palmoplantar involvement.

Discussion

In a study that investigated disease concomitance in psoriasis by using a large database, but without patch

testing, contact allergy was found to be three times less frequent in patients with psoriasis than in the control group (4). Whereas some authors suggest that ACD is uncommon in patients with psoriasis, others have reported a frequent association (5). The prevalence of ACD in patients with psoriasis vulgaris is estimated to range from 20% to 27% (6, 7). Heule et al. (8) found positive patch test reactions in 68% of patients with psoriasis. When healthy subjects were compared with patients with psoriasis, a significantly lower frequency of allergic patch test reactions was found (2, 9). There is, however, no significant difference in responsiveness to patch testing between patients with psoriasis and patients with other dermatological diseases (10). A recent retrospective study involving 2349 patients with psoriasis showed that there were no significant differences in the frequency of ACD between the patients with or without psoriasis (11).

It can be difficult to distinguish between psoriasis lesions and eczema on the palms and soles. The fact that the prevalence of ACD in our study is rather high makes it possible that we, as clinicians, often mistake ACD for psoriasis when palmoplantar involvement occurs in patients with pre-existing psoriasis.

The most commonly relevant allergens were those found in topical products, such as coal tar, fragrances, *M. pereirae* (balsam of Peru), and neomycin sulfate. As occupational relevance was found in 11 (12.5%) of 88 patients, we believe that allergens encountered at work together with koebnerization can aggravate and/or worsen palmoplantar psoriasis.

The results of our study support a possible role of contact hypersensitivity as a provocative factor that elicits or worsens psoriatic lesions on the palms and soles or make them more resistant to treatment. We recommend patch testing in all patients suffering from psoriasis with persistent and therapy-resistant palmar and/or plantar involvement.

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