

Screening patch tests for pigmented contact dermatitis in Israel

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Pigmented contact dermatitis has been found to be caused by fragrances, cosmetics, washing powders, azo dyes in textiles, and rubber products in selected groups of patients. The aim of this study was to run screening patch tests in an unselected group of patients with pigmented contact dermatitis ($n=29$) encountered in our center over a 2-year period. The test series included the European standard, cosmetics, fragrance, Scandinavian photo, and personal products. 21 patients had a positive reaction in at least 1 of the series (total, 29 reactions): 16 – standard, 3 – cosmetics, 1 – fragrance, 9 – photo, and 1 – personal products; 16 (55%) had relevant results. We conclude that the highest yield for screening for pigmented contact dermatitis is achieved with the standard and photo series.

Key words: allergic contact dermatitis; photocontact dermatitis; pigmented contact dermatitis; hyperpigmentation; standard series; cosmetic series; fragrance series; Scandinavian photo series; nickel; preservatives. © Munksgaard, 1999.

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Hyperpigmentation may follow many acute and chronic inflammatory processes in the skin. When in the course of the primary inflammatory reaction, the epidermal-dermal junction is severely disturbed, melanin may pass into the upper dermis to give rise to persistent pigmentation. This is seen, for instance, in lichen planus, lichenoid drug eruption, and fixed drug eruption. Hyperpigmentation may also occur in the course of irritant and allergic contact dermatitis, though it is not a common feature of these disorders. It may be the only macroscopic sign of dermatitis.

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We report our results with screening patch tests in 29 unselected patients with pigmented contact dermatitis. The only presentation in the skin was hyperpigmentation, and there was no inflammatory condition on anamnesis or physical examination.

Patients and Methods

29 patients (21 female, 8 male) aged 15 to 69 years (average, 43 years) with pigmented contact derma-

titis were investigated over 2 years (1996–1998). Pigmented contact dermatitis was suspected in all cases of hyperpigmentation that could not be attributed to a metabolic, endocrine, chemical, nutritional or other postinflammatory cause. The patients were patch tested with the European standard series, cosmetics series, fragrance series and Scandinavian photo series (all from Chemotechnique Diagnostics, Malmö, Sweden). In a few patients, special series were chosen according to their occupation or anamnesis, and in some, personal products were tested.

Testing was performed on the upper back with an occlusion time of 2 days, according to the ICDRG guidelines. In 18 patients, a biopsy specimen was obtained from a pigmented macule.

Results

26 of the patients were Jewish, 8 from Yemen, 5 from Morocco, 5 from India, and 1 each from Ethiopia, Bulgaria and Libya; 5 were of unknown origin. The remaining 3 patients were Israeli Arabs. All participants had a dark complexion.

Duration of the hyperpigmentation was 1 month to 32 years (average, 4 years). It was located on the face in 18 patients (10 of them exclusively

Table 1. Result of the screening patch tests ($n=29$)

Patch test series	No. of reactions		
	positive	negative	relevant
European standard	16	10	10
cosmetics	3	23	2
fragrance	1	24	1
Scandinavian photo	9	11	8

on the face), neck in 12, upper back in 10, chest in 6, upper extremities in 7, and lower extremities in 2. The histologic findings in the 18 patients who underwent a biopsy included postinflammatory hyperpigmentation in 9, typical presentation of lichen actinicus in 8, and macular amyloidosis in 1.

Results of the screening were as follows (Table 1).

European standard series

Of the 26 patients tested, 16 had positive reactions, 10 of which were relevant. The positive allergens were: nickel sulfate – 10 (3 relevant); fragrance mix – 4 (4 relevant); formaldehyde – 2 (2 relevant); potassium dichromate – 2 (1 relevant); neomycin,

colophony (relevant), wool wax alcohols, and cobalt chloride – 1 each.

Cosmetics series

Of the 26 patients tested, 3 had a positive reaction, and 2 were relevant. The positive allergens were: Amerchol L-101 (relevant); Grotan BK – 1 (relevant); octyl gallate – 1; dodecyl gallate – 1.

Fragrance series

25 patients were tested and 1 had a positive and relevant reaction to amylcinnamic aldehyde.

Scandinavian photo series

20 patients were tested and 9 had positive reactions, 8 being relevant. The positive allergens were: perfume mix – 7 (2 of them stronger in the UV-radiated site); formaldehyde – 1; evernic acid – 1 (positive only in the UV-radiated site), all except 1 of the positive perfume mixes being relevant.

In addition, 2 patients were screened with a hair-dressing series, and 1 patient had a positive and

Table 2. Characteristics of patients with relevant results by type of dermatitis (pigmented cosmetic and pigmented contact)

Case no.	Age (years)	Sex	Site of pigmentation	Relevant patch test results
Pigmented cosmetic dermatitis				
1	64	F	face, upper limbs	formaldehyde sandalwood
2	50	F	face, neck, upper back	Kathon CG
3	40	F	face, upper back, neck, chest	Amerchol L-101
4	49	F	upper back, neck, upper limbs	evernic acid
5	67	F	face	perfume mix ^{a)}
6	42	F	neck, arms	perfume mix
7	45	M	face, chest, hands	perfume mix colophony
8	52	F	face	fragrance mix ^{b)}
9	42	F	neck, chest	fragrance mix perfume mix
10	50	F	face	fragrance mix perfume mix
11	57	M	face, neck	fragrance mix formaldehyde Grotan BK amylcinnamic aldehyde
Pigmented contact dermatitis				
1	39	F	face	nickel sulfate
2	50	F	face	nickel sulfate
3	50	F	back, chest, upper limbs, lower limbs	potassium dichromate
4	29	F	arms, neck, thighs	nickel sulfate
5	26	F	neck	4-tert-butylcatechol

^{a)} Perfume mix is in the Scandinavian photo series and contains cinnamic alcohol, cinnamic aldehyde, hydroxycitronellal, eugenol, isoeugenol and geraniol, all at 1% pet. (total 6% pet.).

^{b)} Fragrance mix is in the European standard series and contains cinnamic alcohol, cinnamic aldehyde, hydroxycitronellal, amylcinnamic aldehyde, geraniol, eugenol, isoeugenol and oakmoss absolute, all at 1% pet. (total 8% pet.).

relevant reaction to Kathon CG; 1 patient was tested with a textile dyes and finishes series with negative results; and 1 was tested with the plastics and glues series and had a positive and relevant reaction to 4-tert-butylcatechol (PTBC).

Of the patients tested for personal products, mostly cosmetics, only 1 had a positive reaction, which was to a particular Indian moisturizing cream that contained sandalwood oil. Interestingly, this patient had a negative result to the fragrance series, which contained sandalwood oil.

Discussion

Widespread or localized hyperpigmentation is associated with a large number of conditions, and may be due to genetic or nevroid factors or to acquired factors such as metabolic, endocrine, chemical, physical, nutritional, postinflammatory or tumoral (1). If all of these can be ruled out by anamnesis, physical examination and other tests, pigmented contact dermatitis is suspected.

All our patients had dark complexions, even though approximately $\frac{1}{2}$ the population of Israel has a light complexion. This is in agreement with most other reports on pigmented contact dermatitis (2-6). The most common location for the eruption was the face, and in $\frac{1}{3}$ of patients, the face was the only location. Only 2 patients had the eruption on the lower part of the body.

The literature distinguishes between pigmented cosmetic dermatitis (2, 4, 6, 8) caused by various cosmetic allergens and localized mostly to the face, and pigmented contact dermatitis (7, 8), caused by other allergens and localized to areas other than the face. Of our 16 patients who had relevant patch test results, 11 had pigmented cosmetic dermatitis and 5 pigmented contact dermatitis (Table 2). Only 8 of the 11 patients with pigmented cosmetic dermatitis had involvement of the face; in the other 3, the hyperpigmentation was localized to the neck, chest, arms or upper back (but not the face), and the positive allergen was fragrance or perfume mix. The 5 patients who had pigmented contact dermatitis included 2 with involvement of the face (who were allergic to nickel sulfate) and 3 with no involvement of the face (who were allergic to nickel sulfate, potassium dichromate and PTBC). Therefore, we may conclude that the area of involvement is insufficient to differentiate these 2 entities. It is of interest that 10 of the 11 patients with pig-

mented cosmetic dermatitis had relevant patch test results for fragrance.

21 patients had a positive reaction to at least 1 allergen in the series (total, 29 reactions). The patch test series with the highest yield were the European standard series and the Scandinavian photo series; approximately $\frac{1}{2}$ the patients (14 of 29) had relevant results to at least 1 allergen in these series. The cosmetics and the fragrance series gave a low yield, with only 2 patients showing a relevant result to at least 1 allergen. Nevertheless, in light of the chronicity of pigmented contact dermatitis and the distress it causes the patient, these series should be performed when appropriate.

Our follow-up was too short (less than 1 year) to determine the prognosis in those with relevant results, and the patients continue to be observed in our clinic. In a few cases, great improvement was noted once the patient avoided contact with the offending allergen.

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