

Prevalence and 1-year outcome of facial allergic contact dermatitis in patients patch tested in a university hospital

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Little is known about the prognosis of facial allergic contact dermatitis (FACD). The objective of the study was to investigate the prevalence and 1-year outcome of FACD in patients patch tested. 655 consecutive patients patch tested with European standard series in Peking University Hospital in a 2-year period were studied. At 1 year after testing, all patients were asked a revisit and prognosis of FACD was assessed by the rates of clearance of dermatitis, relapse, and improvement at the final evaluation. Of 599 patients examined, 92 were affected by FACD. All their dermatitis improved. The clearance rate was 55.4%, which was much higher than that (23.1%) of other patients tested in the same period ($P < 0.05$, chi-square test); however, the relapse rate was also high (42.4%). Concurrence of atopic diathesis, ichthyosis, or drug allergy history had no influence on the clearance rates. The clearance rate was significantly lower (40.9%) in patients with disease duration over 3 months before testing. FACD is common among patients patch tested and has a better prognosis than other eczema. Patients with suspected FACD should be tested early and more work is needed to decrease the relapse rate.

Key words: allergic; contact dermatitis; eczema; face; outcome; patch test; prognosis. © Blackwell Munksgaard, 2007.

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Facial dermatitis may result from allergic or irritant contact dermatitis, from endogenous conditions such as atopic or seborrheic dermatitis, or a combination of contributing factors (1). Topical corticosteroids are still the mainstay therapy of this common disease. In some patients, however, persistent or recurrent dermatitis often results in the use of increasing amounts of corticosteroids for longer periods of time and steroid dermatitis is a serious problem (2, 3). It is believed that the prognosis of allergic contact dermatitis (ACD) is better than other types of dermatitis aetiology undefined (4). Patients confirmed as having relevant positive contact allergens have a significant improvement in both perceived eczema severity and quality of life (5). Few studies have evaluated the proportion and prognosis of facial ACD (FACD) in patients patch tested in dermatology clinics. The purpose of this study was to determine the prevalence of FACD in patch-tested patients in a university hospital and analyse its 1-year outcome.

Patients and Methods

Study population

655 consecutive patients with suspected ACD referred by other dermatologists for patch testing and tested in department of dermatology, Peking University Third Hospital from September 2003 to May 2005, were studied. There were 187 males and 468 females, with average age of 40.5 ± 16.0 years. All patients were Chinese Han ethnics.

Patch testing

Patch testing was performed with a modified European standard series of allergens and IQ Chamber (Chemotechnique Diagnostics, Malmö, Sweden; Table 1). Allergens were applied to the upper back and the results were recorded at 2 and 3 days according to International Contact Dermatitis Research Group (ICDRG) grading (6). If possible, patients' own products were also tested using published methods (6). The suspected causal agent

Table 1. Patch test allergens and the test results

Allergen	Positive number (%)
Benzocaine	6 (6.5)
Black rubber mix (<i>N</i> -isopropyl- <i>N</i> -phenyl-4-phenylenediamine, <i>N</i> -cyclohexyl- <i>N</i> -phenyl-4-phenylenediamine, <i>N,N</i> -diphenyl-4-phenylenediamine)	1 (1.1)
2-Bromo-2-nitropropane-1,3-diol (bronopol)	0
Carba mix (1,3-diphenylguanidine, zinc diethyldithiocarbamate, zinc dibutyl dithiocarbamate)	4 (4.3)
Colophonium	5 (5.4)
Epoxy resin	2 (2.2)
Ethylenediamine dihydrochloride	0
Formaldehyde	8 (8.7)
Fragrance mix (cinnamic alcohol, hydroxycitronellal, amylcinnamal, geraniol, eugenol, isoeugenol, oakmoss absolute)	23 (25)
Imidazolidinyl urea	3 (3.3)
Mercapto mix (<i>N</i> -cyclohexylbenzothiazyl sulfonamide, mercaptobenzothiazole, dibenzothiazyl disulfide, morpholinylmercaptobenzothiazole)	0
<i>N</i> -(cyclohexylthio) phthalimide	6 (6.5)
Nickel sulfate	24 (26.1)
4-Phenylenediamine base	13 (14.1)
Parabens (methyl-4-hydroxybenzoate, ethyl-4-hydroxy benzoate, propyl-4-hydroxy benzoate, butyl-4-hydroxy benzoate)	7 (7.6)
Potassium dichromate	8 (8.7)
Sesquiterpene lactone mix (alantolactone, dehydrocostus lactone, costunolide)	2 (2.2)
Thiuram mix (tetramethylthiurammono sulfide, tetramethylthiuram disulfide, tetraethylthiuram disulfide, dipentamethylenethiuram disulfide)	0
Thimerosal (Merthiolate)	14 (15.2)
Tixocortol-21-pivalate	1 (1.1)

was investigated after testing using a questionnaire, in which patient's personal data, present illness, suspected substances exposures, atopic diathesis, and medications were included (7). The relevance of patch testing was analysed in the same way as reported (8). A relevance of positive patch test was considered if the patient had been exposed to the substance containing the positive allergen and dermatitis definitely improved with the avoidance of that allergen. When FACD was strongly suspected, but patch test was negative, a usage test was performed with the method similar to Bashir and Maibach (9) reported. Briefly, patient applied the suspected substance in the same way as when the dermatitis developed, for example, applying suspected facial cream twice daily to a small area (1 × 1 cm) on the face for a week. If eczematous skin reaction occurred in the test period, the test was considered positive and stopped.

Diagnostic criteria

FACD was diagnosed based on disease history, clinical manifestations, results of patch testing, and follow-up analysis according to standard textbooks (4, 6). FACD was excluded if patients with suspected FACD could reapply the suspected substance without any reactions. It was confirmed in patients with relevant positive patch test reaction to allergens in European standard series, with positive patch test reaction to the suspected material as is, or with a positive usage test. If suspected FACD occurred more than twice clinically because of the same substance, FACD was also diagnosed.

Evaluation of prognosis

At 1 year after patch testing, patients were asked a revisit and prognosis was evaluated by the following categories: (i) clearance: completely free of skin symptoms without recurrence for more than 3 months before the evaluation, (ii) relapse: skin lesions have been resolved but reappeared before evaluation, and (iii) improvement or no improvement, which was assessed globally by the observers.

Statistic analysis

The data were processed by chi-square test and rank sum test with statistic software spss (Systat version 11.0; SPSS, Chicago, IL, USA).

Results

599 patients finished the study. There were 180 males and 419 females, with average age 39.9 ± 15.7 years. 15.4% (92 out of 599) were finally identified as having FACD. The result of patch testing is shown in Table 1. The leading positive patch test allergens were fragrance mix, nickel sulfate, thimerosal, *p*-phenylenediamine base, and formaldehyde. Relevant patch tests were found in 23 patients including 11 hair dye allergy patients reacted to *p*-phenylenediamine base, 10 cosmetic allergy patients to fragrance mix, 1 metal allergy patient to nickel sulfate, and 1 colophonium-positive patient to colophonium-containing traditional Chinese medicine. Relevance could not be determined in other patients because whether the positive allergen existed in the suspected substance was unknown.

Except that more females were presented in FACD group, the age, concurrence of atopic diathesis, ichthyosis, and drug allergy history between FACD and the other 507 non-FACD patients were not significantly different (Table 2).

Table 2. Comparisons between FACD and non-FACD patients, number (%)

	FACD (n = 92)	Non-FACD (n = 507)
Average age (years)	35.3 ± 13.0	40.7 ± 15.6
Sex (male/female)	5/87 (0.06)*	175/332 (0.53)
Atopic diathesis	9 (9.8)	52 (10.3)
Ichthyosis	55 (59.8)	263 (51.9)
Drug allergy history	5 (5.4)	56 (11.0)
Clearance	51 (55.4)*	117 (23.1)
Relapse	39 (42.4)*	142 (28.0)
Improvement	2 (2.1)	153 (30.2)
No improvement	0	89 (17.6)

FACD, facial allergic contact dermatitis.

* $P < 0.05$, chi-square test.

All FACD patients' lesions improved on final evaluation. The clearance rate of FACD at 1 year after patch testing was 55.4%, which was much higher than that (23.1%) of the other patients (Table 2, $P < 0.05$, chi-square test). However, the relapse rate was also higher (42.4% versus 28.1%, $P < 0.01$, chi-square test).

Table 3 shows the influence of atopic diathesis, concurrence of ichthyosis, drug allergy, and patch testing on the outcome of FACD. FACD patients with relevant patch test results showed highest clearance rate (69.6%); however, it was not significant. The clearance rate of FACD in patients with short disease duration was significantly better than that in patients with longer disease duration. There were no significant differences in the clearance rates between patients with or without atopic diathesis, ichthyosis, and history of drug allergy.

Discussion

Our results showed that 15.4% patients patch tested were affected by FACD. This result is consistent with Katz and Sherertz's (1) result, in which 22.2% of patients patch tested were affected by facial dermatitis and two thirds of them could be diagnosed as having FACD. These results sug-

gested that FACD is common in patch-tested patients.

The 1-year clearance rate of FACD was much higher than that in the other patients tested simultaneously indicating that FACD had a better prognosis and should be diagnosed early. We assumed that the low clearance rate of 55.4% might be because of the high relapse rate, and lack of allergen information was the main reason for that. The relevance of positive patch test could not be determined in most of our cases because Chinese regulations do not require the manufactures, especially the cosmetic producers, labelling the ingredients on their products; therefore, these patients could not avoid the allergen effectively.

Similar to other reports, female dominance was also found in FACD; however, with only 5 male being presented, the role of sex on the prognosis of FACD could not be studied so far. The clearance rate in FACD patients with or without atopic diathesis, ichthyosis, and history of drug allergy was no different (Table 3) suggesting that these factors had no influence on the outcome of FACD.

Although not significant, the highest clearance rate was found in FACD patients with relevant patch test results (Table 3) suggesting that patients with relevant patch test results might gain more benefits.

In this study, the only significant risk factor for poor prognosis identified was long disease duration (Table 3). The mechanism of this poor prognosis is still unclear. Longer disease duration can cause further skin damage and probably lead to the overuse of corticosteroids, which will result in persistent or recurrent dermatitis. Therefore, patients with suspected FACD should be patch tested early to improve the prognosis.

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Table 3. Clearance rates of FACD by different categories

Category	Clearance rate (%)
Duration less than 3 months/over 3 months	65.7*/40.9
Continuous FACD/noncontinuous FACD	60.9/39.1
Concurrence of ichthyosis/without ichthyosis	52.7/59.5
Atopic diathesis/without atopy	55.6/55.4
Drug allergy/without drug allergy	40/56.3
Relevant patch test/nonrelevant patch test	69.6/50.7

FACD, facial allergic contact dermatitis.

* $P < 0.05$, chi-square test.

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