DERMATOLOGICA SINICA 35 (2017) 16–19

Contents lists available at ScienceDirect

Dermatologica Sinica

journal homepage: http://www.derm-sinica.com

ORIGINAL ARTICLE

Environmental exogenous factors and facial dermatitis: A case control study

Wen-Hui Wang [1], Lin-Feng Li [1,2,*], Xue-Yan Lu [1], Jing Wang [1]

[1] Department of Dermatology, Peking University Third Hospital, Beijing, China
[2] Department of Dermatology, Beijing Friendship Hospital, Beijing, China

ARTICLE INFO

Article history:
Received: Apr 18, 2016
Revised: Sep 2, 2016
Accepted: Sep 7, 2016

Keywords:
alcohol
allergic contact dermatitis
facial dermatitis
patch test
spicy food
sunlight

ABSTRACT

Background/objective: Facial dermatitis is common and the roles different exogenous factors play between facial and nonfacial dermatitis is unknown. The study aim was to investigate the etiology and self-reported exogenous aggravation factors in facial dermatitis.
Methods: There were 89 facial dermatitis patients patch tested in a tertiary hospital during a 1-year period, and 112 patients with nonfacial dermatitis tested in the same period who served as a control. Association of exogenous factors was investigated by multivariate analyses.
Results: Of the cases of facial dermatitis, 30.3% were confirmed allergic contact dermatitis, which was higher than that (23.2%) in controls. Cosmetic allergy was much more common in facial than nonfacial allergic contact dermatitis (96.3% vs. 19.2%); 51.9% of facial allergic contact dermatitis cases were caused by facial creams; 6.7% of facial dermatitis were irritant contact dermatitis, compared with 2.7% for controls; 9.0% of cases were seasonal facial dermatitis. The positive patch test reactions to at least one standard allergen were 65.2% in facial dermatitis and 58.0% in controls. Self-reported exogenous aggravation factors in facial dermatitis were spicy food ingestion (24.7%), low moisture (22.5%), sunlight (19.1%), alcohol ingestion (15.7%), seafood ingestion (14.6%), beef or lamb ingestion (12.4%), and high humidity (5.6%). Multivariate logistic regression analysis adjusting for sex, age, disease duration, atopic diathesis, and contact allergy showed that more patients reported aggravation by sunlight exposure ($p = 0.008$), ingestion of spicy food ($p = 0.025$), or alcohol ($p = 0.044$).
Conclusions: Contact factors play an important role in facial dermatitis. Aggravation by sunlight exposure, ingestion of spicy food, or alcohol are more reported in facial dermatitis compared with nonfacial dermatitis.

Introduction

Facial dermatitis (FD) is very common in dermatology practice, accounting for 30% of patients patch tested.[1–4] Clinically, the etiology of FD is very difficult to determine and recurrence is common. Exogenous factors and endogenous conditions may all possibly contribute to the development or aggravation of FD. Exposure to sunlight[5,6] or low humidity[7] has been reported to aggravate facial atopic dermatitis. Geographic areas with increased temperature, sun exposure, and humidity were associated with poorly controlled eczema in children. It is interesting to investigate the different contributions of environmental exogenous factors to FD and non-FD. The purpose of this study is to investigate the etiology of FD in China and whether exogenous factors play more of a role in FD than nonfacial dermatitis.

Patients and methods

Patients and controls

All patients with FD patch tested using a modified European standard series of allergens in the contact dermatitis clinic of Peking University Third Hospital, Beijing, China during a 1-year period were included. Patients with non-FD patch tested in the same

Conflicts of interest: The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in this article.

* Corresponding author. Department of Dermatology, Peking University Third Hospital, North Garden Road 49, Haidian District, Beijing, 100191, China.
E-mail address: LinfengLidoc@126.com (L.-F. Li).

http://dx.doi.org/10.1016/j.dsi.2016.09.001

period served as a control. The ethnicity of all patients was Chinese Han. The hospital was a tertiary hospital in north Beijing, and patients could be referred, or they were allowed to visit this hospital of their own accord. If the doctor considered that contact factors might play a role in the dermatitis of the patient, a patch test would be recommended; however, the patient would make the final decision to do the test or not.

FD

FD was defined as dermatitis involving the face, other skin diseases involving the face, such as acne, rosacea, herpes simplex, lupus erythematosus, and typical photosensitivity, being excluded by history and clinical examination. Seborrheic dermatitis was not included in this study.

Allergic contact dermatitis

Suspected allergic contact dermatitis (ACD) was diagnosed clinically by the disease history and clinical examination based on standard textbooks.[8,9] Only patients with strong evidence supporting the diagnosis were included. A lesion is a pruritic eczematous eruption and is localized to the area of skin that contacts with a suspected substance. If the patients could reapply the suspected substance without any reactions, a diagnosis of ACD was excluded. Confirmed ACD also fulfilled the following criteria: (1) a positive usage test result; (2) a relevant positive patch testing (PT) reaction to allergens in the European standard series or a positive PT result with the suspected material as is; and (3) a positive repeated open application test result. The usage test was performed using the method similar to that reported by Bashir and Maibach,[10] in which a patient thought to have ACD used the suspected substance in the same way as when the dermatitis developed, for example, by applying suspected facial cream twice daily to a small area (1 cm $\times$ 1 cm) on the face for a week. If an eczematous skin reaction occurred during the test period, the test was considered positive and stopped. PT with the suspected material as is was performed according different product types. For nonrinse-off products, such as facial cream, eyeshadow and lipstick, use the product as is; for rinse-off products, such as facial cleansing lotion and shampoo, use distilled water dilution to 2%; for perfume, use 70% alcohol dilution to 5%. In a repeated open application test, test substances—either commercial products, as is, or special test substances (e.g. PT allergen)—were applied twice daily to the upper arm on a 5-cm $\times$ 5-cm area for a week. If an eczematous skin reaction occurred in the test period, the test result was considered to be positive, and the test was stopped.[9] If the patients had positive standard PT results, but the relevance of positive allergens to the lesions could not be determined, they were classified as suspected ACD.

Irritant contact dermatitis

Irritant contact dermatitis (ICD) was diagnosed clinically by the disease history and clinical examination based on standard textbooks.[8,9] The lesions usually presented as dry erythema with fine scale confined to the contact site with more frequent complaint of burning and stinging, and ACD was excluded by negative PT results.

Seasonal FD

Seasonal FD was defined as FD appearing in spring and autumn and disappearing in summer and winter for >2 years.[11,12]

In patients with multiple factors involved, the final diagnosis was based only on the major cause of the dermatitis. For example, if a patient's dermatitis fulfilled the diagnostic criteria of seasonal FD and was also found to react to some allergens, but the ACD was temporal and could not explain the whole skin condition, the final diagnosis was seasonal FD.

Atopic dermatitis and atopic diathesis

Atopic dermatitis was diagnosed using the UK diagnostic criteria.[13] Atopic diathesis was considered when allergic rhinitis, allergic asthma, or atopic dermatitis could be found in the patient's personal or family history.

The final diagnosis was made by consensus of the authors.

PT

PT was performed using a modified European standard series of allergens including benzocaine, black rubber mix, 2-bromo-2-nitropropane-1,3-diol, carba mix, colophony, epoxy resin, ethylenediamine dihydrochloride, formaldehyde, fragrance mix (FM), imidazolidinylurea, mercapto mix, N-(cyclohexylthio)phthalimide, nickel sulfate, parabens, para-phenylenediamine (PPD), potassium dichromate, sesquiterpene lactone mix, thimerosal, thiuram mix, and tixocortol-21-pivatate (Chemotechnique Diagnostics, Malmö, Sweden). Allergens were applied to the upper back for 2 days and the results were recorded at 2 days and 3 days according to International Contact Dermatitis Research Group (ICDRG) recommendations.[9] If possible, PT with the patients' own products was also performed, using published methods.[9] PT was performed by the same technician, and the results were recorded by the other authors together. The relevance of a positive PT 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.

Investigation of suspected environmental exogenous factors by questionnaire

The suspected causal exogenous agent was investigated by using a modified questionnaire[14] after PT. In the questionnaire, the patient's personal data, history of the present illness (patient's description, date of onset, effects of weekends and vacation on dermatitis, previous therapy, etc.), contactants that existed at work and in clothes, toiletries, household contact and treatment medications, atopic diathesis, and medications used were included. Effects of sunlight exposure, low moisture, high humidity, and food ingestion on the patient's dermatitis were also recorded.

Follow-up

After PT, the patients were followed-up for 3 months to 2 years to further confirm the diagnosis.

Statistical analysis

To assess differences between FD and control, 2 $\times$ Chi-square test or, if appropriate, Fisher exact test was used. Stepwise logistic multiple regressions were performed to identify the statistically significant associate factors of FD. The stepwise models contained sex, age, disease duration, atopic diathesis, contact sensitization, and self-reported aggravation factors. The data were processed using statistical software SPSS (Systat version 16.0, SPSS, Chicago, IL, USA). A p value < 0.05 was regarded as significant.[14]

Results

In total, 89 patients with FD and 112 patients with non-FD were studied. The final diagnoses of each group are shown in Table 1. The