

Eyelid dermatitis: A report of 215 patients

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Between April 2001 and October 2003, 215 persons presented with eyelid dermatitis for the first time. They ranged in age from 4 months to 95 years, with an average age of 49.6 years and a median age of 51 years. There were 173 females and 42 males. 165 of 215 had allergic contact dermatitis (ACD) and another 9 had protein contact dermatitis without relevant positive patch tests. Atopic eczema comprised 37 of 215 (17%), but 33 of 37 also had contact allergies. Seborrheic dermatitis, psoriasis or both were found in 35 (16%). Sources of ACD included personal care products in 54 (25%), including 12 with at least 1 positive patch test to cosmetic applicators and 12 sensitive to at least 1 botanical ingredient. Allergy to artificial nails and/or nail lacquer occurred in 18 of 215 (8%). 5 persons had rosacea or periorbital dermatitis, and 2 had dermatomyositis. Other causes included bacterial, fungal and viral infections, some of which were quite unusual. The evaluation of persons presenting with eyelid dermatitis remains a relatively complex but rewarding discipline.

Key words: allergic contact dermatitis; cosmetic applicators; cosmetics; medicaments; natural rubber latex; protein contact dermatitis. © Blackwell Munksgaard, 2004.

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Eyelid dermatitis, while admittedly a complex problem, has proved most often to be related to allergic contact dermatitis (ACD) in several larger series (1–4). Earlier reports have higher percentages of irritant dermatitis, but when one subtracts those reactive to the allergens then in use from those causing ACD in a large series (1), the percentages of those remaining are similar to those given for irritant dermatitis. Atopic eczema (AE) is said to cause 11–39.5% in 5 studies (1–5), but it is commonly associated with other conditions, especially seborrheic dermatitis, contact dermatitis, protein contact dermatitis (PCD) (1) and growth of *Staphylococcus aureus* (6). Many of these patients have multiple underlying problems, requiring a rather broad study in what may appear to be a simple problem (1). The evidence for dry eyes in a substantial number of these patients, suspected in the earlier study (1), was investigated further and is to be published separately.

The following series of 215 patients was collected after a series of 203 patients was completed and represents a follow-up study. There were some differences, especially in what caused the problem in specific individuals.

Patients and Methods

The series includes patients presenting between April 2001 and October 2003, with an initial complaint of eyelid dermatitis, with or without involvement in other areas, in a private practice limited to contact dermatitis and eczema. The criteria and methodology have been published previously (1). Many ingredients of personal care products were available that were not available in the previous study (1). Ingredient lists of products used were reviewed, and patients were tested only to available ingredients that were found in products they had used. 158 of 215 patients received Schirmer I testing, the results of which have been submitted separately for publication.

Results

The ages ranged from 4 months to 95 years of age, with a median age of 51 and an average age of 49.6 years. There were 173 females and 42 males.

Some 35 had seborrheic dermatitis, seborrheic dermatitis or psoriasis, often with concurrent ACD, representing 16% in this series. Those with AE

comprised 37 of 215 or 17%. Of the 37 patients with AE, however, 30 of 37 were patch-test positive to contact allergens (often together with positive prick tests), and an additional 3 were positive to only (probably relevant) protein antigens on prick testing.

Of the 215 patients, 165 or 77% had ACD and another 9 had PCD without ACD for a total of 81%. 18 persons reacted to nail products. There were 7 sensitive to nail lacquer, all of whom were allergic to tosylamide/formaldehyde resin (TFR), 5 reactive to cyanoacrylate (of whom 2 were in the group allergic to TFR) and 8 were positive to nail methacrylates.

2 each were found to be allergic to cornstarch on prick testing, natural rubber latex protein on radioallergosorbent test or prick testing, and nitrile gloves and vinyl gloves on patch testing.

6 patients had a bacterial infection, all of whom grew *S. aureus* (cultures done on the involved skin in AE commonly were positive for *S. aureus* as well); 2 had tinea involving the eyelids. One had epidemic keratoconjunctivitis, a viral infection.

A total of 54 (25%) reacted to personal care products or ingredients in them. There were 20 who reacted to plant materials other than wood tar, turpentine or colophonium. 12 of these were allergic to botanicals in personal care products, including grapeseed, grapefruitseed, nettles, green tea, ginger, sunflower (1), wheat, sage, oatmeal, ginseng, anize, cocoa butter and yucca. Other ingredients eliciting positive responses were vitamin E, sorbitan, retinyl palmitate and D&C Red 34. Cosmetic applicators produced a reaction in 12 patients, representing 7% of those with ACD.

There were 28 persons who reacted to therapeutic agents, including 23 with a positive test to 1 or more topical corticosteroids. There was a + reaction to tacrolimus and 2 to pimecrolimus topicals.

Of those reactive to metals, 49 reacted to gold sodium thiosulfate, of which 14 were +++ responses and 21 were ++ responses. Nickel allergy was found in 49 also, with 10 +++ and 20 ++ reactions. 5 nickel-allergic women brought in 7 makeups that were positive for nickel on nickel spot test. However, only 1 of those makeups produced a positive patch test.

Comment

Eyelid dermatitis remains a complex area of contact dermatitis, with most patients having multiple causes. The differential diagnosis was given in a previous review (1), but eyelid dermatitis comprises mostly ACD in the larger pub-

lished series (1–3), with over 80% having ACD (including PCD) as the principal cause in both this and the previously published series (1). In many ways, this series is largely comparable to the previously published series of 203 patients (1), including prevalence of seborrheic dermatitis and psoriasis, AE and allergy to cosmetics. Many with AE in this series grew *S. aureus* from skin lesions, as one might predict (6), and they seemed to improve on appropriate antibiotic therapy.

Of 28 persons who reacted to therapeutic agents (excluding over-the-counter products), 22 were allergic to 1 or more topical corticosteroids used on the eyelids. There were 2 reactions to topical pimecrolimus and 1 to tacrolimus. Testing to these agents was done from their release dates, but all 3 reactions in this series were + responses seen in 2003.

Metal allergy was common and frequently relevant. Of those persons allergic to nickel and cobalt, 3 patients were found to have relevant exposure to a metal nail file (1) and 3 to a metal eyelash curler similar to previous reports (7–9). One of those who reacted to her curler also proved to be natural rubber latex sensitive, and hence she probably also reacted to the rubber grip in the curler as well as the metal. One patient allergic to nickel was found to be using a makeup that proved positive on nickel spot testing as well as patch testing. I have looked for this because of previous reports (10–12), but the relevance of this is in question, as 6 other makeups positive for nickel were negative on patch testing. Because nickel is not listed in the ingredients, its presence probably results from contamination in manufacture. Reactions to cosmetics and other personal care products included positive responses to several botanicals in products brought in by the patient, viz. grapeseed, grapefruitseed, nettles, green tea, ginger, sunflower (2), wheat, sage, oatmeal, ginseng, anize, cocoa butter and yucca. Other ingredients eliciting positive responses were vitamin E, sorbitan, retinyl palmitate, and D&C Red 34. Because testing was only done to ingredients in products used by each individual, exposure was documented, and relevance is probable. The number allergic to makeup applicators (12) represented 7% of those with ACD.

Artificial nail products (13–15) seem to make a greater contribution to eyelid dermatitis than nail lacquer (1), although the latter is still important. In this series, 18 persons reacted to nail products. There were 7 of 215 sensitive to TFR, 5 to cyanoacrylate and 8 to nail methacrylates. All of these were probably relevant, as they had all used products matching the allergy within the previous 6 months. Combining the present results

in 215 persons with those in the previous series of 203, nail products were an important contributor, if not the primary cause, of the patient's eyelid dermatitis about 10% of the time.

There were some rather unusual case histories in this series. A patient with chronic AE was sensitive on intradermal testing to both oestradiol and progesterone. Following consultation with and treatment by a gynaecological endocrinologist, she responded rather impressively to suppression of luteinizing hormone and follicle-stimulating hormone with leuprolide acetate for 3 months. Because of the improvement, she elected to undergo endoscopic bilateral ovariectomy and at last report was still doing well.

While allergy to *Malassezia* has been widely reported to be a causative factor in AE (16–21), most studies were done by testing with antigen from *Pityrosporum orbiculare* which was *M. sympodialis*, only 1 of 7 species, albeit the most common in AE (22). Unfortunately, testing for sensitivity, except on a research basis, has been limited to that 1 species. In this country, even that antigen is not available and, according to some European suppliers, it is unlikely to become available. Therefore, allergy in such patients has to be presumed on the basis of prominent eczema in seborrheic areas combined with clearing on treatment to reduce the level of *Malassezia*.

2 men with extensive AE in seborrheic areas had to be managed with daily, followed by weekly, fluconazole to prevent reactions ostensibly to *Malassezia*. 1 of these was helped by sunlight when he visited Arizona, but he had to be managed with oral therapy as he declined treatment with ultraviolet B after returning home. Both are very sensitive to house dust mite on both patch testing and prick testing, and 1 who has both delayed and urticarial reactions to house dust mite on patch test (predictably) flares when he travels. In more than 1000 persons patch tested to house dust mite in this practice, urticarial responses have been seen only in 5 persons with AE, all of whom show strong relevance and some of whom demonstrate airborne contact.

1 older man had tinea corporis, caused by *Arthrrium phaeospermum*, a rare cause of tinea corporis (23, 24). The eruption was found on the right side of the face and neck, with prominent eyelid involvement. The area had been treated with many different topical corticosteroids, and a potassium hydroxide examination was prominently positive. The organism grew from multiple colonies in quantity in less than a week, almost in pure culture with a few colonies of *Epidermophyton* sp. The tinea cleared with oral fluconazole 200 mg oral weekly for 6 weeks, though was largely

clear in the first 2 weeks. The same patient also grew *S. aureus* from impetiginized lesions of the face that did not involve the eyelids.

Another patient presented with an acute onset of severe inflammation, eyelid dermatitis, swelling and tearing of the left eye. She was sent the same day to an ophthalmologic subspecialist in corneal and external eye disease and was found to be suffering from epidemic keratoconjunctivitis, a highly contagious, adenoviral process.

Because patients were asked to apply topical agents with a disposable (vinyl) glove to avoid hand transfer, patients were tested to glove materials previously used or to be used. 2 each were found to be allergic to cornstarch, natural rubber latex protein, nitrile gloves and vinyl gloves. The reason for this is that the allergen in such cases is difficult to find or predict. Cornstarch is, of course, the usual allergen in glove powder but may cause reactions unrelated to gloves (25, 26). Natural rubber latex protein is known to cause eyelid dermatitis (1), and vinyl gloves are also known to cause glove dermatitis, although less often than natural rubber latex gloves (27, 28).

Overall, most patients had multiple causes and most of those with ACD had multiple sensitivities. It seems highly probable that many had different causes at different times. Dry eyes likely represent an underlying factor in most older patients, as the Schirmer tests were below 10 mm in at least one eye in 41 of 58 persons over 60.

The treatment plan was previously published (1). For those with ACD, elimination of hand transfer and topical hydrocortisone ointment applied with a vinyl glove (provided neither was positive on testing) usually resulted in rapid clearing, but avoidance of allergies found in the workup was necessary to maintain this. The workup and evaluation of patients with eyelid dermatitis remains a somewhat complex but rewarding discipline.

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