Contact sensitivity to topical corticosteroids in India

SIR,

The first report of allergic contact dermatitis from topically applied hydrocortisone appeared in the late 1950s.[1] The prevalence of allergic contact dermatitis to topical corticosteroids varies from region to region and appears to be associated with the regional availability of corticosteroids and prescribing practices. Prevalence rates up to 5% have been reported.[2] The most common form is delayed-type hypersensitivity, but type 1 allergy has also been observed.[3]

The allergen in most corticosteroids is thought to be steroid glyoxal, a degradation product, which interacts with arginine. High arginine-binding corticosteroids, including non-fluorinated steroids such as hydrocortisone are more likely to cause sensitization. Some groups of patients are considered to be at increased risk of corticosteroid sensitivity. These are patients using multiple steroid-based preparations for long periods for the treatment of eczema, leg ulcers, stasis dermatitis, perianal dermatitis, hand and foot eczema, chronic actinic dermatitis and facial dermatitis. Patients with corticosteroid sensitivity can present with varied manifestations such as chronic eczema, local urticarial rash and poor response to treatment or worsening of disease following application of topical steroids.

In India, over the counter availability of corticosteroids and patients indulging in self-medication puts individuals at a higher risk of corticosteroid sensitivity. Subramanian et al. reported delayed sensitivity (on day 10) to clobetasol-17-propionate and betamethasone 17-valerate in a 64-year-old male upon testing with the Indian Standard Series (ISS) and medicament series.[4] We were unable to find any previous reports of a formal study to assess the prevalence of corticosteroid sensitivity in Indian patients.

One hundred subjects were recruited from the contact dermatitis clinic of the Postgraduate Institute of Medical Education and Research, Chandigarh. We included patients with leg ulcers, stasis dermatitis, perianal dermatitis, hand and foot eczema, chronic actinic dermatitis and facial dermatitis who had disease for more than 3 months and who were, or had been using topical preparations. Detailed examination of the patient was done with respect to sites involved and morphology of lesions.

Patch testing was performed with the corticosteroid series (Chemotechnique Diagnostics, Sweden, [Table 1]) using aluminum chambers pre-mounted on hypoallergenic Scanpor tape and the results were recorded at 48, 96, and 168 h. according to the International Contact Dermatitis Research Group criteria. Patients on oral steroid doses equivalent to or more than 15 mg of prednisolone or other immunosuppressive medications were not included. No other patch test series was tested.

Of 100 study subjects, 71 (71%) were males and 29 (29%) were females. Overall mean age of the study population was 47.4 years (range, 19–72 years).

The studied population included 27 (27%) office workers, 25 (25%) farmers, 18 (18%), housewives, 16 (16%) retired government servants, 10 (10%) shopkeepers, and 4 (4%) students. Thirty-six (36%) individuals suffered from occupational dermatitis, 18 (18%) farmers had air-borne contact dermatitis to parthenium, 12 (12%) had hand eczema aggravated by household work, and stasis dermatitis was observed in 6 (6%) patients who were shopkeepers requiring prolonged hours of standing.

Of 100 patients included, 44 had facial dermatitis, 33 had involvement of the hands, and 23 had leg eczema. The mean total duration of illness was 5.8 years (range, 0.5–20 years; median, 5 years; SD, 4.4 years). Air-borne contact dermatitis was the most common cause of facial dermatitis, followed by chronic actinic dermatitis. In the facial dermatitis group, the average

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**Table 1: Constituents of corticosteroid series used**

| Allergen                        | Concentration (%w/w) | Vehicle      |
|---------------------------------|----------------------|--------------|
| Budesonide                      | 0.01                 | Petrolatum   |
| Betamethasone-17-valerate       | 1                    | Petrolatum   |
| Triamcinolone acetonide         | 1                    | Petrolatum   |
| Tixocortol-21-pivalate          | 0.1                  | Petrolatum   |
| Alclomethasone-17,21-dipropionate | 1                  | Petrolatum   |
| Clobetasol-17-propionate        | 1                    | Petrolatum   |
| Dexamethasone-21-phosphate      | 1                    | Petrolatum   |
| Hydrocortisone-17-butyrate      | 1                    | Alcohol      |
| Desoximetasone                  | 1                    | Petrolatum   |
duration of illness was 6.3 years (range, 5–20 years; SD, 9.7 years).

Thirty-three patients (24 males and 9 females) had hand eczema with the average duration of illness being 4.6 years (range, 0.5–15 years; SD, 14.3 years). Twenty-three patients (15 males and 8 females) had leg eczema and all patients had stasis dermatitis. The average duration of illness was 6.8 years (range, 1–20 years; SD, 13 years).

The most commonly used corticosteroid group was group D1, followed in decreasing order of frequency by group A and group B (Coopman’s classification). The most commonly used steroids, such as clobetasol propionate, clobetasone butyrate, mometasone furoate, fluticasone propionate, belong to group D1. Four patients gave history of using hydrocortisone (Group A). Three (3%) of our patients reported intermittent use of budesonide (Group B) in the inhalant form (Figure 1).

In two patients, tixocortol-21-pivalate was positive at all three readings done at 48, 96, and 168 h. However, none of these patients reported aggravation of their symptoms with topical corticosteroid use.

Previous studies from Europe have reported a prevalence of 0.2% in Barcelona,[5] 1.6% in Belgium,[6] and 4.8% in a series from United Kingdom.[7] Tixocortol-21-pivalate allergy is a marker of group-A corticosteroid allergy. In India, group-A corticosteroids are available in steroid-only topical formulations as hydrocortisone acetate or butyrate, in combination with hydroquinone and tretinoin for patients with melasma, and in combination with topical antibiotics or antifungals. Considering the ease of availability of these medications and the tendency for self-medication the likelihood of these patients having used a topical corticosteroid preparation is high.

Tixocortol pivalate[8,9] and budesonide[10] have been reported as the most common sensitizers across studies. Molecules belonging to groups A, B, and D2 (the labile esters) are more likely to induce sensitization than the D1 group steroids, despite being among the most frequently prescribed preparations.

Our study had a small sample size of 100 patients. Complete and reliable history regarding the nature of exposure to topical corticosteroids, drug compound, formulation, and use of over the counter topical corticosteroids could not be elicited in a few of our patients, as they were not formally educated and unable to provide the information sought.

The overall prevalence of 2% positive patch test reactivity observed in our study is within the reported range. Our study population had no previous exposure to tixocortol pivalate because it is not commercially available in India. The availability of hydrocortisone acetate in various topical medications could be the possible reason for positive reactions to tixocortol observed by us (cross-reactivity). Currently the Indian Standard Series recommended for patch testing by Contact and Occupational Dermatoses Forum of India does not include any topical corticosteroid. Our data suggests that tixocortol pivalate should be included in the Indian Standard Series.

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| **Table 1** |
|-------------|
| **Age group** | **Number of patients** |
| 1-6 years    | 15 |
| 7-12 years   | 15 |
| 13-18 years  | 20 |

| **Table 2** |
|-------------|
| **Symptoms**|
| Itching     |
| Exudation   |

| **Table 3** |
|-------------|
| **Allergens**|
| Nickel sulfate |
| Cobalt chloride |
| Neomycin sulfate |
| Fragrance mix |
| Parthenium |
| Black rubber mix |

Patch testing in children: An experience from Kashmir

Sir,

Allergic contact dermatitis in children is a significant problem worldwide and should be an important diagnostic consideration in children with chronic refractory dermatitis. Allergic contact dermatitis used to be considered a rare problem in children but the prevalence is currently estimated to be between 14.5% and 70%.[1] Patch testing in children differs significantly from that in adults, although it is accepted that the dilution of allergens used should be same in both groups.[2]

In our study, all children in the age group of 1–18 years suffering from any persistent, pruritic, eczematous dermatitis including resistant classical atopic dermatitis and atypical atopic dermatitis were included. The study was conducted for a period of 1 year, from August 2013 to July 2014 in the contact dermatitis clinic of the Department of Dermatology, SMHS Hospital, Government Medical College, Srinagar, after obtaining approval of the institute ethics committee. A detailed history was taken followed by a thorough cutaneous examination. Patch test was performed after excluding any contraindications to the procedure.

A twenty-allergen Indian standard battery approved by the Contact and Occupational Dermatoses Forum of India (CODFI) and marketed by Systopics India Pvt. Ltd., was used. Readings were carried out as per the International Contact Dermatitis Research Group guidelines on day 2, 30 minutes after removal of the patches with a second reading on day 4 and again on day 7, if required.[3]

A total of 60 patients in the age group of 1–18 years were studied [Table 1] with a mean age of presentation of 9.52 ± 2.13 (mean ± standard deviation) years. The male: female ratio was 1:1.8 and 68.3% of the patients were from urban areas. The most common presentation was pruritic eczematous dermatitis. The most common symptoms were itching and exudation. The sites commonly involved were hands, feet, face, eyelids, neck, legs and arms [Table 2].

A positive patch test was seen in 20 (33%) patients, 14 (70%) girls and 6 (30%) boys. Among these, 15 patients had positive reactions which were determined to be of “definite” or “probable” current clinical relevance. The total number of positive reactions was 44 (average of 2.2 reactions per patient). Eight patients showed a positive reaction to a single allergen and 12 to multiple allergens. Positive patch test reactions increased with age; 26.7% in 1–6 years, 26.9% in 7–12 years and 47.4% in 13–18 years age group [Table 1].

Positive patch test reactions were common with nickel sulfate, cobalt chloride, neomycin sulfate, fragrance mix, potassium dichromate, paraphenylenediamine, balsam of peru, parthenium and black rubber mix [Table 3]. In our study, nickel sulfate was the most common allergen causing 11 (25%) positive reactions with a positive relevance in 63.6% of the patients. Detailed questioning revealed the common sources to be metals in jewelry, ear piercing, zippers and cell phones. Co-sensitization with metals seems to be a cause for cobalt allergy. Use of topical antibiotics in patients of atopic dermatitis caused reactions to neomycin sulfate. Exposure to cosmetics and perfumes resulted in positive reactions to fragrance mix and peru balsam. Use of leather footwear and construction activity at/near homes seemed to trigger hypersensitivity to potassium...