

Patch test results in a Turkish paediatric population

Contact Dermatitis 2008; 58: 63–65

Meltem Onder and Esra Adisen

Department of Dermatology, Gazi University Faculty of Medicine, 06500 Besevler, Ankara, Turkey

Allergic contact dermatitis is increasing in childhood. In children, population-based patch test studies point to different contact sensitizers and reflect the variations in the exposure to certain allergens among different countries. Our aim is to show common contact allergens in a paediatric population in Turkey. Contact dermatitis and identifying the suspected allergen in children are important as sensitization occurring during childhood may cause a susceptibility to the contact dermatitis later in their life.

Key words: allergic contact dermatitis; children; contact sensitization; paediatric population; patch test.

Allergic contact dermatitis (ACD) is increasing in childhood (1–4). In children, population-based patch test studies point to different contact sensitizers and reflect the variations in the exposure to certain allergens

among different countries. There is no study that investigated the contact allergens in the paediatric population in Turkey. Our aim is to show common contact allergens in a Turkish child age group.

Materials and Methods

From 1993 to 2005, 360 patients (2–16 years) with the diagnosis of contact dermatitis were patch tested in the Department of Dermatology, Gazi University Faculty of Medicine. Characteristics of the patients were recorded. Of the patients tested, 118 (32%) had one or more positive allergic patch test reactions. All 118 patients were divided into 2 age groups (group 1, 2–8 years and group 2, 9–16 years). Patients with atopic dermatitis, asthma, and/or hay fever were recorded as atopics. Atopic dermatitis was defined in accordance with the criteria of Hanifin and Rajka (5).

All patients were tested with the European Standard Series (Hermal, Reinbek, Germany). Additional series and/or patient's products were also tested when indicated. The methodology of the procedure and the evaluation of the readings were in accordance with the International Contact Dermatitis Research Group guidelines.

Clinical relevance of the positive reactions was considered if the patient described a cutaneous exposure to a product known to contain the allergen to which the patient reacted. In the present study, only positive reactions to the standard allergens were evaluated.

Results

24 allergens were tested on 360 patients. Of the patients tested, 118 (32%) had one or more positive allergic patch test reactions. The female/male ratio was 1.95. Frequency of sensitization to European Standard Series allergens is summarized in Table 1. The most common allergen was nickel sulfate (46%). Present clinical relevance of the positive patch tests was found in 30.5% of the patients. Of 118 children, only 4 (0.3%) had or had had atopic dermatitis. Therefore, the influence of atopic dermatitis to the patch test positivity was not assessed in the study. The influence of age in the occurrence of sensitization and specific results according to sex were also assessed in the study (Table 2). Positive reactions were high in number in group 2. Nickel sulfate was the most frequent allergen in both age groups.

The most common clinical forms of dermatitis were chronic dermatitis (65%), followed by acute dermatitis (25%), chronic dermatitis with erosions and fissures, lichenification, and hyperkeratosis (10%). ACD in 118 patients affected 204 different areas shown in Table 3.

Discussion

In the present study, the frequencies of positive reactions in paediatric population were found to be 32%. It has been varied from 14.5% to 70.7% in different studies so far (6–9).

Our results have shown that sensitization to nickel is the most common

Table 1. Frequency of sensitization to European Standard Series allergens^a

Allergen	Positivity (%)
Nickel sulfate 5%	57 (46)
Cobalt chloride 1%	11 (9.5)
<i>p</i> -Phenylenediamine 1%	11 (9.5)
Neomycin sulfate 20%	9 (7)
Formaldehyde 1%	6 (4.6)
Fragrance mix 8%	5 (3.9)
CL-methylisothiazolinone 0.01%	4 (3.1)
Mercapto mix 2%	4 (3.1)
Quaternium 15%	3 (2.3)
Benzocaine 5%	3 (2.3)
Potassium dichromate 0.5%	2 (1.5)
Paraben mix 12%	2 (1.5)
Balsam of Peru 25%	2 (1.5)
Others: Thiuram mix 1%, epoxy resin 1%, colophony 20%, quinoline mix 6%, primin 0.01%, thimerosal 0.1%, isopropyl phenyl 0.1% <i>p</i> -phenylenediamine, MBL mercaptobenzothiazole 0.01%	8 (7.1)

^aAll in pet. unless or otherwise indicated.

Table 2. The influence of age in the occurrence of sensitization

Age	Group 1 (2–8 years)			Group 2 (9–16 years)		
Positivity rate	34/84 (40.4%)			84/276 (30%)		
	Girls	Boys	Total	Girls	Boys	Total
Nickel sulfate	13	2	15	39	3	42
p-Phenylenediamine diamine hydrochloride	0	2	2	2	7	9
Cobalt chloride	2	1	3	4	4	8
Neomycin sulfate	2	0	2	3	4	7
Fragrance mix	1		1	3	1	4
Formaldehyde	1	1	2	3	1	4
Potassium dichromate	0	0	0	1	1	2
CL-methylisothiazolinone	2	0	2	1	1	2
Benzocaine	0	1	1	0	2	2
Quaternium	1	1	2	0	1	1
Balsam of Peru	1	0	1	1	0	1
Paraben mix	0	1	1	0	1	1
Mercapto mix	1	2	3	0	1	1
Others	3	0	3	0	5	5
Total	27	11	38	57	32	89

Table 3. Affected areas

Affected area	Frequency (%)
Hand	37.7
Face and neck	30.3
Extremities	8.8
Diffuse	7.8
Feet	6.3
Trunk	5.8
Anogenital region	2.4
Scalp	0.04

contact allergen in children younger than 16 years in a Turkish population. Nickel allergy has the highest prevalence in group 2 in women, similar to findings of other studies (1, 3, 4). Ear piercing may be the main nickel source. Piercing is a common tradition in Turkey and is performed even in the first years of life. Families have a general tendency to have their children's ear pierced at the first 2–3 years ages and to wear on golden ear to keep the hole open. Low-carat gold may contain nickel as well.

p-Phenylenediamine (PPD) was the second most common allergen in our second age group. PPD is a chemical agent, which is used in black henna and permanent hair dyes. Temporary henna tattoos (black henna) are becoming popular in young age groups, which explain increased PPD contact reactions (2, 10). This has led to increased reporting of cutaneous reactions after hair dying in teenage group (2).

Neomycin sulfate was the third most common allergen. It is widely used for topical antibiotic purposes. It is used in prescription and/or over the counter medicines. Seidenari et al. (11) patch tested 1094 children and

found neomycin to be the most frequent contact allergen in this population. The high prevalence of sensitization to neomycin sulfate in the paediatric population shows that topical antibiotic use is common in this age group. Families and physicians should be aware of the contact sensitization potential of these agents because their further uses may be complicated with ACD.

Similar to other studies (12, 13), children with foot eczema were positive to potassium dichromate and formaldehyde in our study. Contact dermatitis from shoes can be managed by the recognition and avoidance of the responsible allergens.

Heine et al. (14) had an article about patch test in German children, in which thimerosal was on the top in the most common allergen list. Wohrl et al. (15) had performed patch test in 2776 consecutive patients and compared the children group with adults. Reactions to nickel and thimerosal were much more common in children than in adults. However, in our 2 groups, we observed only 1 positive reaction to thimerosal with vaccination.

Prevalence of contact sensitization is becoming more frequent in Turkish childhood population. Contact dermatitis and identifying the suspected allergen in children are important as sensitization occurring during childhood may cause a susceptibility to the contact dermatitis later in their life.

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Address:

Dr Esra Adıgün
Department of Dermatology
Faculty of Medicine
Gazi University
06500 Besevler, Ankara
Turkey
Tel: +90 312 202 61 29
Fax: +90 312 212 90 18
e-mail: eozsoy@gazi.edu.tr