

Contact dermatitis in children: 6 years experience (1992–1997)

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We report the results of patch tests carried out over the last 6 years (1992–1997) on 141 children. This corresponds to 2.8% of the total patients who were patch tested in our Allergy Department (5,014). These 141 children were patch tested using the TRUE TestTM standard series and an additional allergen, metallic mercury. Allergens from the Chemotechnique medicaments, cosmetics, plants and shoe series were added in some. The most frequent localization of eczema was to the feet, face and hands and the most frequent suspected causes were costume jewellery, footwear, topical medicaments and cosmetics. The most frequent allergens, assessed by degree of relevance, were first, nickel, followed by cobalt, mercurials (thimerosal and metallic mercury), fragrance and rubber chemicals (naphthyl mix, mercapto mix, carba mix and PPD mix). 13 children, 18% of the total, between the ages of 12 and 14 years, showed positivities relevant to some occupation, i.e., metalworking, building, hairdressing, catering, etc. Once patch tests had been carried out and relevant positive patch tests assessed, the most frequent diagnoses were contact dermatitis 45%, atopic dermatitis 25%, juvenile plantar dermatitis 15%, and other diagnoses in the remaining 15%.

Key words: children; allergic contact dermatitis; Standard TRUE TestTM; metallic mercury; costume jewellery; footwear; topical medicaments; cosmetics; rubber chemicals. © Munksgaard, 1998.

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After 3 previous reports (1–3) concerning statistical studies of patch tests carried out on Spanish children, and taking into account that some authors, all the time fewer (4, 5), hold the opinion that the concentrations of patch tests on children should be lower than those used to patch test adults, even though the majority, including ourselves, hold the opposite opinion (2, 3, 6–8), we have made a statistical study of the results obtained in our Allergy Department on children up to the age of 14 over the last 6 years (1992–1997). In comparison to others referred to in the literature, this statistical study has been compiled according to the materials and methods described below: thus, the results could differ in some respects, where selection criteria have been different.

Materials and Methods

During the last 6 years (1992–1997), patch tests have been carried out on 5014 patients, of which 141, 2.8% of the total, were children up to 14 years old. These 141 children were all tested using the

TRUE TestTM standard series, to which we added metallic mercury 0.5% (pet.). In some of these children, when the clinical history was indicative, Chemotechnique series (shoes, medicaments, plants, cosmetics, and in 4 cases, hairdressing) were also added.

Of these 141 children, 71 (45 female and 26 male), representing 50% of the children and 1.4% of the total patients patch tested, were positive to 1 or more allergens. Table 1 shows the distribution by age and sex and Table 2 shows the personal and/or family background of atopy in the 71 children by sex.

Results

After assessing the relevant results, the most frequent diagnoses in the 146 children patch tested were contact dermatitis 45%, atopic dermatitis 25%, juvenile plantar dermatitis 15%, and the remaining 15% other diagnoses (3).

The positive results in both sexes and in total by allergens, specifying the degree of relevance, can be seen in Table 3, where it is clear that nickel, cobalt

Table 1. Ages and sex of children tested

	Girls	Boys	Total
0–3 years	0	0	0
4–9 years	11	8	19
10–14 years	34	18	52
total	45	26	71

Table 2. Atopic background

	Yes	No
girls	27	18
boys	17	9
total	44	27

and mercury (thimerosal and metallic mercury) are the most frequent allergens, followed by fragrance mix and rubber chemicals.

The most frequent localizations (Table 4) were feet, face and hands, in that order, and the most frequent causes (Table 5) are costume jewellery, footwear, topical medicaments and cosmetics, also in that order.

Lastly (Table 6), we show the positive allergens related to a determined occupation in 13 children (6 female and 7 male) from 12 to 14 years old. This represents 18% of the total children with some relevant positivity.

Discussion

50% of positive patients in our current study is greater than the 3 previous reports in Spain (31% (1), 35% (2) and 37% (3)) and certain other authors (24% (6), 13% (9), 35% (8) and 23% (10)), but simi-

Table 4. Localizations of eczema

	Girls	Boys	Total
feet	11	9	20
hands	6	4	10
hands and feet	3	2	5
face	12	2	14
body and extremities	8	5	13
generalized	5	4	9
total	45	26	71

Table 5. Most frequent causes

	Girls	Boys	Total
imitation jewellery	21	0	21
footwear	10	9	19
topical medicaments	7	9	16
cosmetics	5	2	7
clothing	0	2	2
others	2	4	6
total	45	26	71

Table 6. Occupational positivities in children tested

	Girls	Boys	Total
hairdressing	3	1	4
metalworking	1	3	4
building	0	2	2
catering	2	1	3
total	6	7	13

Table 3. Relevance of positive allergens

	Girls	Boys	Total	Present	Past	Unknown
nickel sulfate	25	2	27	19	6	2
cobalt chloride	13	3	16	8	2	6
thimerosal	6	6	12	6	2	4
metallic mercury	5	4	9	3	4	2
fragrance mix	4	2	6	3	1	2
carba mix	4	2	6	3	0	3
thiuram mix	4	2	6	5	0	1
phenylenediamine base	3	1	4	4	0	0
potassium dichromate	1	3	4	4	0	0
mercapto mix	3	1	4	3	1	0
mercaptobenzothiazole (MBT)	3	1	4	3	1	0
neomycin	2	2	4	3	1	0
wool alcohols	2	2	4	2	0	2
4-tert-butylphenol-formaldehyde resin	1	3	4	4	0	0
formaldehyde	1	2	3	1	0	2
Kathon CG, 100 ppm	1	0	3	3	2	0
balsam of Peru	1	1	2	1	1	0
colophony	1	0	1	1	0	0
PPD mix	1	0	1	0	0	1
total	80	40	120	75	19	26

lar to those of still other authors (46% (7), 48% (11), 52% (4) and: 56% (12)). Concerning the global results, specifying the degree of relevance in each positive allergen, they are similar, not to say identical, to all the studies reviewed. Nickel is al-

ways the commonest allergen, followed by cobalt, mercurials (thimerosal and metallic mercury), rubber chemicals (thiuram mix, carba mix, mercapto mix and mercaptobenzothiazole, and PPD mix), and fragrance mix. The most frequent sources are costume jewellery (nickel in earrings sensitizes, above all girls from early infancy), medicaments, footwear, cosmetics and plants (1, 3, 4, 8, 9, 11, 12, 26).

Mercury (thimerosal and metallic mercury) is an allergen with greater %s of sensitization in children than in adults (13, 14). Recently, these %s have increased from 2.3% (9) to 10% (15) due to iatrogenic sources (antiseptics, topical medicaments and thermometers) (2, 3, 15–17, 26, 49), vaccines (18) and footwear (3, 19). With reference to footwear, in this study as in previous (1, 3), it is the 2nd source of sensitization in children, after nickel from earrings, due to p-tertiary-butylphenol-formaldehyde resin, rubber chemicals, potassium dichromate and the already cited thimerosal (3, 19). Weston et al. (20) found that 42% of children with contact dermatitis on the dorsum of feet had relevant positivities to allergens related to footwear.

Occupational sensitization, at paediatric age, has been referred to in the literature, with %s of 7% (14), 10% (21) and 12% (1). In this study, it was 18%. Some authors (22, 28) warn of this and suggest carrying out patch tests in children before they begin to work. We do not agree, due to the risk of active sensitization (29–32). The most frequent occupations involved are hairdressing and catering in girls, and metalworking and construction in boys. These %s of occupational sensitization increase if we consider paediatric age as older than 14 years, up to 16–18 years old and then speak of children and young adults (6).

With reference to atopic children having a lower capacity for sensitization than non-atopics, it is our personal opinion that atopic children have a greater capacity for sensitization (10, 12, 23–25).

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