

Contact allergy to fragrances and parabens in an atopic baby

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Case Report

A 10-month-old Caucasian atopic baby girl was seen with a 6-week history of a persistent diaper (nappy) rash. Topical corticosteroids had provided some relief but the rash always recurred.

The mother showed that a number of perfumed cosmetic skin care products had been used: creams, toilet milks, specific products for the diaper area, wash oil, and baby toilet tissues (several brands). She was being fed with a 'hypoallergenic milk product' and had eaten fruits, vegetables, and meat since she was 5 months, without any evidence for intolerance.

The baby had a severe erythematous eruption with red papules, scaly plaques, and small erosions on the convex skin surfaces of the pubic area and buttocks with sparing of the skin folds (Fig. 1). She also had eczematous areas on the forehead and cheeks. A diagnosis of atopic dermatitis was suggested. Skin swabs for bacteriology and fungal cultures of the pubic lesions were negative.

Because the lesions did recur despite the use of the prescribed topical corticosteroid preparation and a moisturizing cream prepared by a pharmacist, patch testing was performed when the baby was 14 months old. We tested a reduced baseline series (Trolab, Hermal, Reinbeck, Germany) with a few additions (Table 1) and the topical products the baby had been in contact with. Patch testing was performed with van der Bend chambers (van der Bend, Brielle, the Netherlands) mounted on Micropore (3M Health



Fig. 1. Severe erythematous eruption with red papules, scaly plaques, and small erosions on the convex skin surfaces of the pubic area and buttocks with sparing of the skin folds.

Care, Borken, Germany) and fixed with Mefix® (Mölnlycke Health Care, Göteborg, Sweden). Positive reactions were noted to fragrance mix 1 (+ D2 and ++ D4), paraben mix (– D2 and + D4), and to several skin care products that had been applied to the baby's skin since birth, i.e. Galenco® baby care cream for the diaper area (Galenco SA, Bornem, Belgium) (+ D2 and + D4), Mustela® cold cream nutri-protective (+ D2 and + D4), and Mustela toilet milk (Expan-science, Courbevoie, France) (– D2 and + D4) (Fig. 2). The cosmetic products that tested positively did contain parabens and fragrances, the use of which was discontinued. We prescribed a local corticosteroid and a moisturizer not containing these allergens. However, 1 month later, the baby's mother contacted us and provided pictures of the lesions, which had again flared. We contacted the pharmacist who had prepared the pre-

scribed creams, and indeed, parabens had been added by mistake.

To determine which component of fragrance mix 1 was the culprit, patch testing was performed at the age of 18 months, which showed contact allergy to isoeugenol (+ D2 and + D4). The positive test to isoeugenol was also considered relevant for the dermatitis the baby had presented: among 11 other fragrance components to be labelled, it was found to be present in one brand of the baby wipes that had been used, namely the 'dermatologically tested' baby toilet tissues Broekies® (Intigena AG, Zug, Switzerland).

Discussion

It was once thought that allergic contact dermatitis was rare among children, particularly infants, because of

less exposure to contact allergens and a relatively immature immune system. However, the prevalence of allergic contact dermatitis in children has been reported to be between 13.3% and 24.5% in several cross-sectional studies (reviewed in 1). It is difficult to compare the results between these studies because they vary with regard to patient-related factors, such as age and sex distribution and the presence of atopy, and technical factors such as criteria for patch testing, selection of patch test series, and patch test methodology. Social and regional differences in exposure may further modify the contact allergy patterns.

Patch testing in children is considered to be safe. Most authors think that irritant reactions are infrequently observed (except in atopics, particularly with metals) and that the same patch test concentrations as in adults can be used. However, if false-positive reactions occur, the patch test concentration should be lowered. Further practical problems concern the reduced test surface area, the hypermobility (which may result in loss of patch test materials), particularly in young children, and the reluctance of some parents to allow patch testing (2).

Case reports have even documented allergic contact dermatitis among children as young as 1 week of age (3). Some of the contact allergens to which children have been found to be sensitive include nickel, cobalt, fragrance mix, neomycin, colophonium, *Myroxylon pereirae*, *p*-phenylenediamine, mercaptobenzothiazole, thiuram derivatives, and formaldehyde and related preservatives (2, 4–7).

Table 1. Patch test series used

Tested substances	Concentration
Thiuram mix	1% pet.
Formaldehyde	1% aq.
Colophonium	20% pet.
<i>Myroxylon pereirae</i>	25% pet.
Wool alcohols (lanolin alcohol)	30% pet.
Paraben mix	15% pet.
Fragrance mix 1	8% pet.
Chloromethyl- and methylisothiazolinone	0.01% aq.
Tixocortol-21-pivalate	0.1% pet.
Propylene glycol	10% aq.
Fragrance mix 2	14% pet.
Sorbitan sesquioleate	20% pet.



Fig. 2. Positive patch test results (D4) to the skin care products used.

Fragrance allergy in children seems to be common. This may be due to the promotion and use of perfumed products made specifically for children, including products for the diaper area and baby wipes, in which, besides fragrances also preservative agents such as the methyl(chloro)isothiazolinone mixture are notorious sensitizers (8). Moreover, young children may 'play' with cosmetics and girls are more likely to wear perfumed cosmetics and hair products (2, 9), even those from their mothers. With regard to isoeugenol, this is the second most commonly sensitizing constituent of fragrance mix 1; its maximum use concentration is 200 p.p.m. (industry guidelines). The same restriction should apply to the sum of isoeugenol and its derivatives, such as esters (isoeugenol substitutes), which cross react and are increasingly being used in cosmetics (10).

Parabens rarely cause sensitization on healthy, undamaged skin and are, therefore, considered safe in cosmetics (11). However, topical pharmaceutical preparations that are applied on damaged skin, particularly if water based, contain preservatives such as chlorocresol, phenoxyethanol, sorbic acid, or parabens (labelled as hydroxybenzoates in medications), which can lead to confusion for patients or prescribers. The diaper area is a particular environment where occlusion of the skin and urinary and faecal secretions lead to an increased humidity level and irritation, particularly in atopics (2, 12, 13), facilitating the penetration of potentially allergenic (and toxic) substances.

Conclusions

This case report demonstrates that in atopic children, occlusion and barrier damage of the skin may facilitate skin sensitization, even to weak allergens and already at an early age. Therefore, any child with persistent eczema whatever the age should be referred for patch testing. Last but not least, also in (small) children testing with the products used is important.

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