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Allergic contact dermatitis in children: "emerging allergens".

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Dear Editor,

this letter aims to draw the attention of dermatologists and pediatricians to certain emerging allergens that may cause allergic contact dermatitis (ACD) in children. Allergic contact dermatitis is an inflammatory skin disease, that is a cell-mediated hypersensitivity reaction (type IV) to exogenous antigens. The diagnosis is made by patch testing (20). As reported in literature, the tests may occasionally result positive to "emerging" allergens in the general population or peculiar population, as for fragrances in atopic children (16).

Medical devices. Recently, some reports of ACD to medical devices, as glucose sensors and insulin pump, have been described in the literature. The description of these cases seems so be increasing, affecting also the pediatric population.

Type 1 diabetes is an insulin-dependent condition, requiring accurate knowledge of blood glucose levels to properly inject appropriate insulin units. Glucose sensors have significantly improved glycemic control, along with the quality of life of these patients. However, some patients developed skin reaction under the adhesives of the medical devices. Contact dermatitis resulting from the use of glucose monitoring systems and patch insulin pumps represent a very important health issue.

Several studies revealed that isobornyl acrylate (IBOA) and N-Ndimethylacrylamide were the most common culprit of the allergic reaction, also in children (8, 12, 13). Herman et Al. described the cases of 12 children with a reaction to medical devices, either glucose sensors or insulin sets. Among them, 10 turned out positive to IBOA 0.1% in petrolatum (8). IBOA seems to be the culprit allergen in all the cases of adverse cutaneous reactions caused by FreeStyle Libre®, a continous glucose monitoring system (4). Of note, IBOA has been identified also as hidden allergen inside alkyl glucosides, in the form of an impurity collected during the industrial process, explaining some cases of allergic reaction to alkyl glucosides (6). The sensitizing role of acrylates was described also for electrocardiogram electrodes, even if in these cases the most common culprit allergens are acrylic acid and methacrylates (7). ACD to electrocardiogram electrodes was described also in a 1-year-old girl: colophonium and modified resins resulted the culprit allergens (5). In view of the literature data, we may suggest that IBOA should be produced as a standardized patch test substance and tested in patient with skin reaction to glucose sensors and/or insulin pumps.

Artificial nails and "fake nails". Artificial nails have been around for ages. They are commonly made of acrylic substances and are a well-known cause of occupational and non-occupational ACD in adults (14). During the last years artificial nails or "fake nails" have been increasingly used also by children since these products are today easily available on the web. Anyway, all the cosmetic and esthetic procedures may cause adverse reactions: while henna tattoo are well-known sensitizers for many years and parents are now aware of their risk (3, 15), artificial nails are an "emerging" problem (1).

Recently, Alves et Al. described the case of an 11-year-old girl that developed a recalcitrant hand eczema caused by the manipulation and "playing" with the mother's professional products for nail esthetics (1). Patch tests revealed sensitization to acrylates, and the skin reaction resolved after avoidance of the above-mentioned products confirming the diagnosis of hand eczema due to nail acrylate allergy.

This case emphasizes the potential risks of these nail esthetic products, as for temporary tattoos; particularly in a young individual, acrylate allergy is important to bear in mind in a choice of

career, namely for jobs such as esthetician, dental prosthetics or dentists where acrylate exposure may be significant.

"Slime". Slime is a popular childhood toy that is sold in major stores nationwide. In addition, children can customize their "slime" with recipes found online to alter its color or texture. These recipes include common products as laundry detergent, dishwashing soap, liquid glue, food coloring and glitter. They then play with the "slime" with their hands, enjoying its stretchy consistency. Although reports of slime causing skin irritation are common, case reports of slime-induced ACD have only recently and increasingly surfaced (2, 9, 10, 11). Clinicians should be aware of this emerging cause of ACD and important source of sensitization among children. All the reported cases of ACD to slime are mainly related to isothiazolinones that are antimicrobials widely used as preservatives or biocides in cosmetics, household and industrial products. They are well-known as strong sensitizers (18) and some Authors suggested also the possibility of cross reaction among isothiazolinones and imidazoles (19). ACD to "slime" caused by isothiazolinones has been reported also as possibly photoaggravated (17). Once a child is sensitized to isothiazolinones, he has to lifelong avoid other sources of exposition to these products.

In conclusion, recently several Authors reported new cases of ACD in children caused by "emerging" allergens contained in medical devices (devices for diabetics, electrocardiogram electrodes) and popular childhood toys. These products are worldwide widely used resulting in an increasing prevalence of contact sensitization. We suggest that an urgent regulation on these products is needed.

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