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How to cite this article: Llamas-Molina JM, Prados-Carmona Á, Velasco-Amador P, Ruiz-Villaverde R, Navarro-Triviño FJ. Allergic contact dermatitis caused by herbicide containing glyphosate-isopropylamine salt. *Contact Dermatitis*. 2023;88(3):230-232. doi:10.1111/cod.14252

Non-occupational allergic contact dermatitis from epoxy resin in children's games

Magalie Coco-Viloin  | Maella Severino-Freire | Françoise Giordano-Labadie

Dermatologie, Hôpital Larrey, Toulouse, France

Correspondence

Magalie Coco-Viloin, Service Dermatologie, Unité Allergologie, Hôpital Larrey, 24 Chemin Pouvoirville, 31400 Toulouse, France.

Email: m.cocoviloin@gmail.com

KEYWORDS: allergic contact dermatitis, case report, children, children's game, epoxy resin, non-occupational, recreational, TikTok

With the emergence of social networking children are engaging in new activities that expose them to contact allergens unusual for their age.

We report a young girl who developed severe allergic contact dermatitis (ACD) after making objects using epoxy resins, a technique which she discovered on TikTok.

CASE REPORT

A 12-year-old atopic girl suffered from dermatitis on her right upper limb which had rapidly spread to her face, ears, and neckline. After

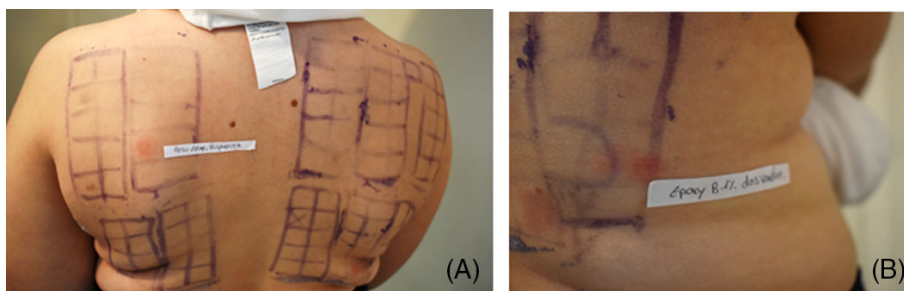
approximately 3 days she developed a severely itchy voluminous oedema of the face and eyelids for which her general practitioner prescribed her oral antihistamines and corticosteroids.

The facial oedema worsened (Figure 1A), and she was referred to the emergency department of the Children's Hospital. Blood analysis and chest x-ray did not detect any abnormalities but given the presence of severe palpebral oedema and facial pain, together with fever (38.5°C), she was admitted to a paediatric unit for 48 h. A tentative diagnosis of an upper respiratory infection was put forward, and intravenous antibiotics were administered, yielding no improvement after 48 h. Subsequently, dermatological advice suggested the possibility of



FIGURE 1 (A) Facial eczematous eruption with voluminous eyelid oedema. (B) Photograph after healing

FIGURE 2 (A) Positive patch test reaction (++) to epoxy resin 1% pet. on D3. (B) Positive patch test reaction (++) to bottle B 1% pet. on D3



an acute contact eczema and following the application of topical corticosteroids (fluticasone propionate 0.05%) the dermatitis finally settled (Figure 1B).

History revealed the application of an Aloe vera-containing cream on the face the day before the eruption had occurred, and the use of an 'anti-stress' lavender essential oil on the wrists. Moreover, recent painting work had been done at home, raising the possibility of an airborne ACD from isothiazolinones.

Furthermore, this child being a '2020 generation' teenager using social networks had discovered on TikTok, thanks to the 'influencers' that she follows, the possibility of making objects from epoxy resins. For the past 6 months she had made various objects (e.g., bowls, cutting boards) whilst protecting herself with vinyl gloves and an FFP-2 mask during the mixing of a specific type of resin ('bottle A') with a hardener ('bottle B').

The epoxy resin-containing products had been purchased on the internet, where they are readily available, also on [Amazon.com](https://www.amazon.com), the leading e-commerce website in France, without any warning regarding potential skin sensitization risks.

She had been practicing this recreational activity for 48 h before the skin reaction occurred.

Patch tests were carried out with the European baseline series, cosmetic series, plastic & glues series, and epoxy series (Chemotechnique Diagnostics, Vellinge, Sweden), using IQ Ultra chambers, together with the Aloe vera cream ('as is') and, the lavender essential oil (5% pet.). The epoxy resin bottle A (1% aq.) and hardener bottle B (1% aq. and 1% pet.) were tested according to published recommendations.¹

Patch tests were occluded for 48 h, and readings—performed on day (D) 2 and D3 showed a ++ reaction to epoxy resin 1% pet. from the baseline series, and a ++ reaction to bottle B 1% pet, yet no reaction to bottle B 1% aq. (Figure 2A,B). An irritant patch test was observed to 2 phenylglycidylether 0.25% pet.

Pertinent negatives were the Aloe vera cream and the lavender essential oil, as well as bottle A (1% aq.), the latter potentially overdiluted in a less appropriate vehicle, hence likely resulting in a false-negative test result.

Direct and airborne non-occupational ACD from an epoxy resin system in a children's game was eventually diagnosed.

DISCUSSION

Occupational ACD from epoxy resins is well-known.² However, the use of epoxy resins in recreational activities is increasing, especially

with the emergence of social networks promoting such activities. Consequently, recreational ACD from epoxy resins has been reported 3 times since 2020.^{3,4}

Although epoxy resin-containing occupational products are well-known allergenic products, there are no regulations regarding their sale to, or use by, the general public, including minors. In our case, these products were obtained from the internet without any difficulties, which is worrisome.

We advised this young girl to completely avoid the handling of any epoxy resin-containing product.

This contact allergy may impact later career choices, that is, could restrict access to occupations such as aeronautics, building work and painting.

In conclusion, this case demonstrates the importance of careful anamnesis, also about recreational activities, and shows that ACD from epoxy resins should nowadays also be considered outside a professional context. Particularly children can become affected, through recreational activities promoted on social networks, possibly jeopardizing future career choices.

It is necessary to regulate access to epoxy resins for hobbyists who are not always aware of the risks, and who do not know how to adequately protect themselves when using epoxy resins.

AUTHOR CONTRIBUTIONS

Magalie Coco-Viloin: Investigation; writing – original draft. **Maella Severino-Freire:** Investigation. **Françoise Giordano-Labadie:** Validation; supervision; methodology; formal analysis.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

PATIENT CONSENT

Patient's written consent was obtained.

ORCID

Magalie Coco-Viloin  <https://orcid.org/0000-0002-0613-4021>

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How to cite this article: Coco-Viloin M, Severino-Freire M, Giordano-Labadie F. Non-occupational allergic contact dermatitis from epoxy resin in children's games. *Contact Dermatitis*. 2023;88(3):232-234. doi:10.1111/cod.14254

Contact dermatitis to undergarments

Rhea Ahuja  | Abhishek Bhagwat | Kaushal Verma 

Department of Dermatology and Venereology, All India Institute of Medical Sciences, New Delhi, India

Correspondence

Kaushal Verma, Department of Dermatology and Venereology, All India Institute of Medical Sciences, New Delhi 110 029, India.

Email: prokverma@hotmail.com

KEYWORDS: case report, patterned, rubber, undergarment

INTRODUCTION

Contact dermatitis to textiles is an uncommon dermatosis with a prevalence ranging from 1.4% to 5.8%.^{1,2} It usually presents as eczematous lesions localized to site of close contact with the garments. We hereby report a rare case of contact dermatitis to underwear elastic rubber.

CASE REPORT

A 54-year-old woman presented to our outpatient department with complaints of itchy oozy lesions on lower back and buttocks for the past 2 months. On examination, there was involvement of the lower back, buttocks and upper thighs in the form of hyperpigmented excoriated papules and plaques (Figure 1A). The dermatitis was sharply demarcated corresponding to site of close contact with her underwear elastic (Figure 1B). There was a history of recent purchase of new unwashed undergarments, though she could not exactly corroborate increased itching with the newer inner wear. There was no history of recent change in her clothes laundering detergents or bleaches. With the striking patterned distribution, a clinical diagnosis of textile contact dermatitis to her undergarments was made, though a potassium hydroxide mount was done to exclude superficial dermatophytic infection, which did not show any fungal hyphae.

Thereupon patch tests with Indian Standard Series³ (Chemotechnique Diagnostics, Vellinge, Sweden), textile series (containing textile dye mix, disperse orange 3) and patient material from undergarments (thin strips cut from inner aspect of two undergarments) were performed. One of the strips from the inner aspect majorly contained the elastic rubber, while the other strip comprised of innerwear clothing material. The commercially available allergens were tested using Finn chambers (8 mm diameter), and the material from

undergarments was tested using distilled water as a vehicle on Whatman filter paper (no. 3, 1 × 1 cm, GE Healthcare UK Limited, Buckinghamshire, UK). All tests were secured on the back using Micropore tape (3M Healthcare, Minnesota, USA), and occluded for 48 h and the patch test readings were performed as per International Contact Dermatitis Research Group guidelines. On D2 (at 48 h) and D4 (at 96 h), there were positive reactions to mercaptobenzothiazole (+++) and to one of the patient's undergarment material (+) (Figure 2).

The patient was advised not to use the culprit undergarments and apply betamethasone valerate cream 0.1% on the eczematous lesions, following which all the lesions healed within next 4 weeks.

DISCUSSION

Contact dermatitis to textiles has shown an increasing trend with an increase in the number of culprit allergens namely textile dyes, rubber additives and finishing chemicals. Lazarov estimated the sensitization rates to be 12.9% among 641 patients with suspected textile dermatitis, with the most common allergens being dyes, formaldehyde and textile finish resins.⁴

Allergic contact dermatitis to underwear has been infrequently reported. Neilson et al. reported 14 cases of suspected contact dermatitis to use of newly purchased unwashed undergarments. Four of these patients underwent patch testing with serial dilutions of oleoresin and abietic acid and to patient material from new unwashed undergarments. All these patients showed a strong positive reaction to oleoresin and two of these patients also had a positive patch test reaction to patient material, similar to our patient.⁵ Jordan et al., found strong positive reactions to undergarment material washed with sodium hypochlorite having sharply demarcated dermatitis along the undergarment suggestive of contact sensitization, as in our patient.⁶