

CONTACT POINT

Allergic contact dermatitis caused by Irganox 1076 used as antioxidant in non-woven fabric

Junko Hattori | Risa Tamagawa-Mineoka  | Sachiko Ueda | Koji Masuda | Norito Katoh

Department of Dermatology, Kyoto Prefectural University of Medicine Graduate School of Medical Science, Kyoto, Japan

Correspondence

Dr. Risa Tamagawa-Mineoka, Department of Dermatology, Kyoto Prefectural University of Medicine Graduate School of Medical Science, 465 Kajii-cho, Kawaramachi Hirokoji, Kamigyo-ku, Kyoto 602-8566, Japan.
Email: risat@koto.kpu-m.ac.jp

KEYWORDS: allergic contact dermatitis, antioxidant, case report, patch testing

CASE REPORT

A 10-year-old Japanese boy developed cerebral haemorrhage secondary to cerebral arteriovenous malformation, and underwent surgery. On postoperative day 2, he developed pruritic erythema on his chest and abdomen (Figure 1A). The lesions were controlled by treatment with topical corticosteroids for 2 weeks.

Allergic contact dermatitis was suspected, and patch testing was performed with the items that the patient may have come into contact with during surgery, for example, non-woven sheets, polyurethane foam mats, and povidone-iodine solution, and also with the Japanese baseline series, with 2 days of application. Patch tests were read on day (D) 2, D3 and D7 according to ICDRG guidelines. Positive reactions (++) to non-woven sheets (Figure 1B) and colophonium were found. The fabric was made mostly of polyethylene, and included 4 additives (Irganox 1076, Irgafos 168, Sumilizer GP, and calcium stearate), whereas colophonium was not contained in the fabric. Subsequently, patch testing was performed with the components of the sheets, polyethylene "as is", Irganox 1076 (2% pet., 0.5% pet., and 0.05% pet.), Irgafos 168 (1% pet., 0.1% pet., and 0.01% pet.), Sumilizer GP (1% pet., 0.1% pet., and 0.01% pet.), and calcium stearate (1% pet., 0.1% pet., and 0.01% pet.). The concentrations were chosen according to previous reports of patch testing with sterically hindered phenolic antioxidants.^{1–3} Allergens were applied with Finn Chambers (Epitest, Tuusula, Finland) mounted on Scanpor tape (Norgeplaster Alpha, Vennesla, Norway). Among the 4 additives, positive reactions (+++) to Irganox 1076 were observed (Figure 1C). Thus, allergic contact dermatitis caused by Irganox 1076 was diagnosed, and the patient was instructed to avoid direct contact with plastics products; there has been no recurrence of skin symptoms.

DISCUSSION

Irganox 1076, the allergen in our case, is the trade name of octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate. This substance is a sterically hindered phenolic antioxidant and non-discolouring stabilizer for organic substrates such as plastics, synthetic fibres, elastomers, adhesives, waxes, oils, and fats. Irganox 1076 is commonly used as a plastic additive in food packaging polymers, medical devices, and similar products.⁴ To the best of our knowledge, this is the first case of allergic contact dermatitis caused by the sterically hindered phenolic

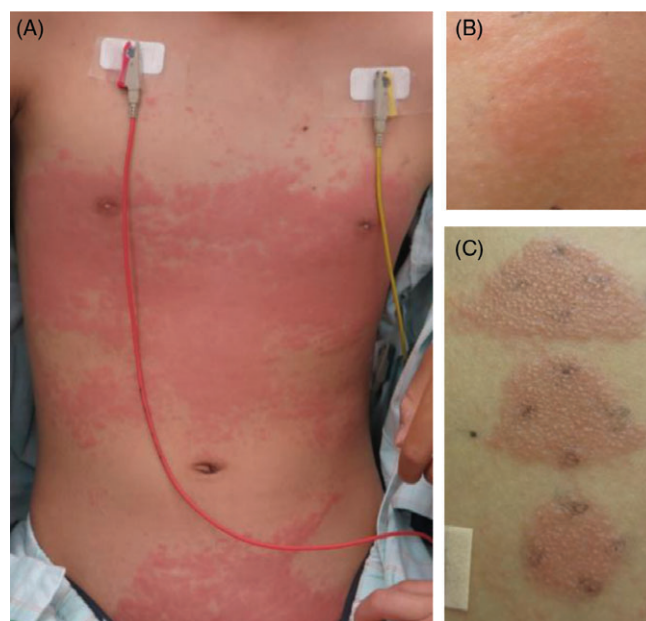


FIGURE 1 A, Clinical findings of the patient's trunk. B, Patch test reactions of non-woven sheets on day 3. C, Patch test reactions of Irganox 1076 at the concentrations of 2% pet. (upper), 0.5% pet. (middle) and 0.05% pet. (lower) on day 3

Junko Hattori and Risa Tamagawa-Mineoka contributed equally to this study.

antioxidant Irganox 1076. Different sterically hindered phenolic antioxidants have similar structures, so cross-reactions between these substances can be expected. Clinicians should consider allergic contact dermatitis caused by antioxidants in non-woven sheets in patients developing skin eruptions after surgery.

ACKNOWLEDGEMENTS

We thank Sasaki Kazumi and Mitsuru Numata of the National Institute of Technology and Evaluation for the provision of the antioxidants.

Conflict of interest

The authors declare no potential conflict of interests.

ORCID

Risa Tamagawa-Mineoka  <http://orcid.org/0000-0001-9379-9584>

REFERENCES

1. White IR, Lovell CR, Cronin E. Antioxidants in cosmetics. *Contact Dermatitis*. 1984;11:265-267.
2. Dissanayake M, Powell SM. Allergic contact dermatitis from BHT in leg ulcer patients. *Contact Dermatitis*. 1989;21:195-196.
3. Le Coz CJ, Schneider GA. Contact dermatitis from tertiary-butylhydroquinone in a hair dye, with cross-sensitivity to BHA and BHT. *Contact Dermatitis*. 1998;39:39-40.
4. Neal-Kluever AP, Bailey AB, Hatwell KR. Safety assessment for octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate (CAS Reg. No. 2082-79-3) from use in food contact applications. *Food Chem Toxicol*. 2015;86:176-190.

How to cite this article: Hattori J, Tamagawa-Mineoka R, Ueda S, Masuda K, Katoh N. Allergic contact dermatitis caused by Irganox 1076 used as antioxidant in non-woven fabric. *Contact Dermatitis*. 2018;1-2. <https://doi.org/10.1111/cod.13013>