

Allergic contact dermatitis caused by isobornyl acrylate in two patients treated for idiopathic pulmonary arterial hypertension

Laura Malinauskiene¹  | Goda Šlekyte¹ | Martin Mowitz²  | Marlène Isaksson² | Rolandas Zablockis¹

¹Faculty of Medicine, Institute of Clinical Medicine, Clinic of Chest diseases, Immunology and Allergology, Vilnius University, Vilnius, Lithuania

²Department of Occupational and Environmental Dermatology, Skåne University Hospital, Lund University, Malmö, Sweden

Correspondence

Laura Malinauskiene, Center of Pulmonology and Allergology, Vilnius University, Santariškių str.2, Vilnius LT-08661, Lithuania.

Email: laura.malinauskiene@santa.lt

KEYWORDS: acrylates, allergic contact dermatitis, case report, Cleo⁹⁰ infusion set, isobornyl acrylate, mass spectrometry, medical device

Various medical devices are used increasingly for chronic diseases (eg, pulmonary hypertension) to ensure continuous disease activity monitoring or for drug infusion. There are many publications on allergic

contact dermatitis (ACD) caused by FreeStyle Libre glucose sensor or other glucose monitoring devices.¹ We report two cases of ACD caused by the infusion sets used to treat pulmonary hypertension with isobornyl acrylate (IBOA) as the culprit allergen.



FIGURE 1 Hyperpigmentation after dermatitis in sites where Cleo⁹⁰ infusion set was attached



FIGURE 2 Acute bullous dermatitis on the upper arm after removing Cleo⁹⁰ infusion set, which was attached for 3 weeks

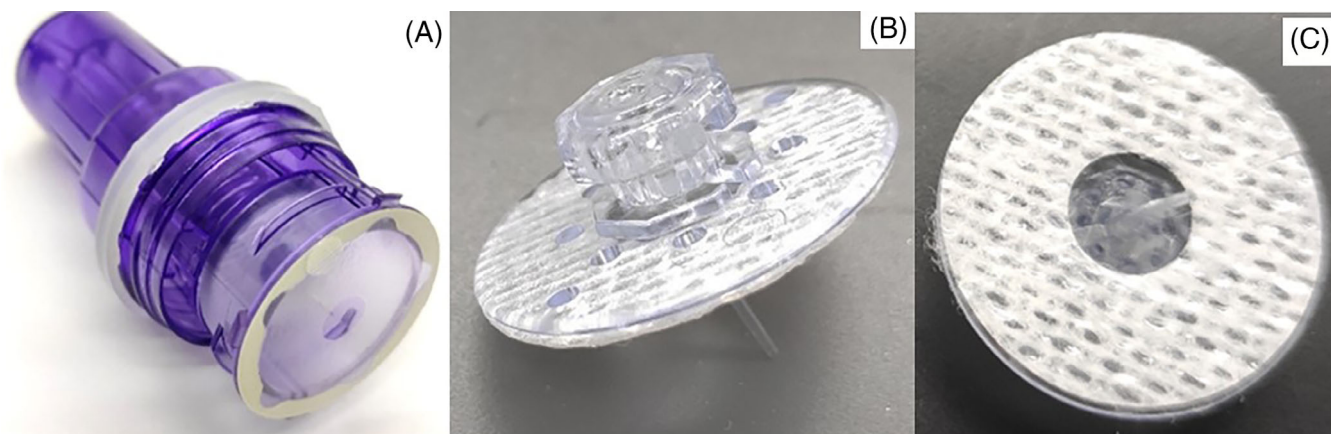


FIGURE 3 The Cleo⁹⁰ infusion set is delivered in an applicator (A). The transparent adhesive patch which is in direct contact with the skin is mounted on the bottom of the applicator. When the infusion set is applied, the plastic part containing the cannula (B) is fixed to the transparent adhesive patch as the plastic part contains a second, white adhesive patch on the bottom side (C)

CASE REPORT

Two patients (53- and 47-years-old, both female) presented with dermatitis on their abdomen, where a subcutaneous Cleo⁹⁰ infusion set (Smiths Medical, Dublin, Ohio) was attached (Figures 1 and 2). Because of idiopathic pulmonary arterial hypertension, they were treated with continuous subcutaneous infusion of treprostinil, which is a synthetic analogue of prostacyclin and a vasodilator used for the treatment of pulmonary arterial hypertension.² For a few months, dermatitis was suspected to have been caused by treprostinil. To rule out contact allergy, both patients were patch tested with the European baseline series, with pieces and ultrasonic bath extracts of the transparent and white adhesive part of Cleo⁹⁰ infusion set in ethanol, IBOA 0.1% pet., and *N,N*-dimethylacrylamide 0.1% pet.^{3,4} Acetone extracts of different materials in the infusion set were analyzed by gas chromatography–mass spectrometry (GC-MS) as described earlier.³

Both patients developed strong or extreme positive reactions to the adhesive pieces of the set, to the extracts, and to IBOA. One patient was also positive to *p*-tert-butylphenol formaldehyde resin (Online Supplemental Table S1). The GC-MS analyses showed the presence of IBOA in the extracts of both the transparent and the white adhesive patches and in the extract of the plastic part containing the cannula (Figure 3). The IBOA concentrations corresponded to a total IBOA content of 5–7 µg in each material. For the adhesive patches, this corresponds to a surface dose in the range of 1–2 µg/cm². We recommended that the patients use barrier hydrocolloid-based plasters (eg, Suprasorb F or Compeed) attached to their skin underneath their infusion system⁵ and they were able to tolerate infusions further on.

DISCUSSION

This is the first case of contact allergy to IBOA present in the Cleo⁹⁰ infusion set used for treatment with treprostinil.

ACKNOWLEDGEMENT

The authors thanks Dr. D. Hoppenot from the Hospital of Lithuanian University of Health Sciences (LSMU) Kauno klinikos for clinical assistance.

AUTHOR CONTRIBUTIONS

Laura Malinauskiene: Conceptualization; investigation; methodology; project administration; writing-original draft; writing-review and editing. **Goda Šlekyte:** Data curation; investigation; validation. **Martin Mowitz:** Investigation; project administration; writing-review and editing. **Marléne Isaksson:** Investigation; methodology; validation; writing-review and editing. **Rolandas Zablockis:** Data curation; methodology; writing-review and editing.

CONFLICT OF INTEREST

No conflict of interest.

ORCID

Laura Malinauskiene  <https://orcid.org/0000-0001-5834-5915>

Martin Mowitz  <https://orcid.org/0000-0001-6172-9274>

REFERENCES

1. Herman A, Baeck M, de Montjoye L, et al. Allergic contact dermatitis caused by isobornyl acrylate in the Enlite glucose sensor and the paradigm MiniMed quick-set insulin infusion set. *Contact Dermatitis*. 2019; 81(6):432–437.
2. Torres F, Rubin LJ. Treprostinil for the treatment of pulmonary arterial hypertension. *Expert Rev Cardiovasc Ther*. 2013;11(1):13–25.
3. Herman A, Aerts O, Baeck M, et al. Allergic contact dermatitis caused by isobornyl acrylate in Freestyle[®] libre, a newly introduced glucose sensor. *Contact Dermatitis*. 2017;77(6):367–373.
4. Mowitz M, Herman A, Baeck M, et al. *N,N*-dimethylacrylamide—a new sensitizer in the FreeStyle libre glucose sensor. *Contact Dermatitis*. 2019;81(1):27–31.
5. Kamann S, Heinemann L, Oppel E. Usage of hydrocolloid-based plasters in patients who have developed allergic contact dermatitis to Isobornyl acrylate while using continuous glucose monitoring systems. *J Diabetes Sci Technol*. 2020;14(3):582–585.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

How to cite this article: Malinauskiene L, Šlekyte G, Mowitz M, Isaksson M, Zablockis R. Allergic contact dermatitis caused by isobornyl acrylate in two patients treated for idiopathic pulmonary arterial hypertension. *Contact Dermatitis*. 2020;1–3. <https://doi.org/10.1111/cod.13617>

Online supplemental Table 1. Patch tests results

Tested material	Patient No 1	Patient No 2
European baseline series (Chemotechnique, Vellinge, Sweden)	negative	++ p-tert-butylphenol formaldehyde resin 1% pet. (D2)
<i>N,N</i> -dimethylacrylamide 0.1% pet	negative	negative
Isobornyl acrylate 0.1% pet.	+++ (D2)	+++ (D2)
Pieces and ultrasonic bath extracts of the adhesive part of Cleo ⁹⁰ infusion set in ethanol	+++ (D3)	++ (D2)