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Allergic contact dermatitis to isobornyl acrylate in a home nail glue

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Isobornyl acrylate (IBOA), a photopolymerizable monomer commonly employed in coatings, sealants, glues, and adhesives, has garnered attention for its role in causing allergic contact dermatitis (ACD) to glucose monitors and insulin pumps.[1] We present a case of ACD to IBOA found in a home nail glue, expanding the spectrum of this acrylate allergen to nail cosmetics.

CASE REPORT

A 40-year-old atopic, non-diabetic woman was referred for patch testing for 2 months of pruritic, painful fingertip and periungual dermatitis (Figure 1) accompanied by facial and eyelid involvement. Suspecting a correlation with gel nails and false nails performed at home starting several months before the onset of symptoms, the patient ceased using these products approximately a month before patch testing, followed by clearance of the rash. She worked from home at a desk job and had not previously been employed as a manicurist.

Patch testing was performed with the North American Contact Dermatitis Group 2023–2024 screening series and supplemental cosmetic and acrylates trays. At the final reading, there were positive reactions to various (meth)acrylates, including 2-hydroxyethyl methacrylate (HEMA) and ethyl acrylate, as well as an unexpected 1+ reaction to IBOA (Table 1). Ingredients review of the patient's gel nail polishes confirmed the presence of HEMA, and in addition, IBOA was listed in Saviland Solid Nail Glue Gel, a UV-cured adhesive which she had used to apply false nails. There were also positive reactions to fragrance mix 1 (fragrance [not otherwise specified] was listed in a nail serum), methylisothiazolinone and benzisothiazolinone (both with unclear relevance), and nickel (past relevance). Patch tests to sesquiterpene lactone mix and ethyl cyanoacrylate were negative.

DISCUSSION

Home gel nail kits are an emerging source of non-occupational cases of ACD to acrylates, with HEMA most commonly implicated.[2–4] In a recent review of ingredients in 394 nail products, HEMA was listed in approximately 60% of products, whereas IBOA was comparatively rare, found in only 1.5%.[5] However, a recent chemical analysis of 37 gel/acrylic nail products reported that 9 were found to contain IBOA although only 1 listed IBOA in the ingredients.[6] Despite its infrequency in cosmetic nail formulations, IBOA possesses unique characteristics such as hardness, flexibility and impact resistance, making it a prevalent component in adhesives used for diabetes devices.[1]

We report a patient with a typical clinical presentation of gel nail allergy who had an unexpected positive patch test to IBOA which was confirmed to be present in her home nail glue. Although patch testing was positive to multiple other (meth)acrylates, IBOA is not known to commonly cross-react with other (meth)acrylates, increasing the likelihood that she was independently sensitized to IBOA from her nail product.[7] Despite targeted testing to IBOA on our acrylates series since 2020 and inclusion on the screening series since 2023, this is the first case of nail acrylate ACD with a positive IBOA patch test we

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FIGURE 1 Vesicular fingertip dermatitis associated with home gel nail cosmetics.

TABLE 1 Positive patch tests to (meth)acrylates in a home gel nail cosmetic user.

Allergen	48-h reading	96-h reading
2-hydroxyethyl methacrylate, 2% pet	1+	2+
Ethyl acrylate, 0.1% pet	1+	1+
2-hydroxy-ethylacrylate, 0.1% pet	1+	2+
2-hydroxypropyl-methacrylate, 2% pet	1+	2+
Butylacrylate, 0.1% pet	1+	1+
Ethylene glycol dimethacrylate, 2% pet	+/−	1+
Tetrahydrofurfuryl methacrylate, 2% pet	1+	1+
Triethylene glycol diacrylate, 2% pet	1+	1+
1,4-butanediol dimethacrylate, 2.0% pet	1+	1+
Isobornyl acrylate, 0.1% pet		1+
1,6-hexanediol diacrylate, 0.1% pet		+/−

have encountered. We are aware of only one study reporting a patient with nail cosmetic ACD with positive patch tests to IBOA alongside other (meth)acrylates; however, the study does not report whether IBOA was found among the patient's exposures or thought to be a cross reaction.[8] Our patient did not react to sesquiterpene lactone mix (which may cross-react with IBOA in some cases) or ethyl cyanoacrylate (expected, since [meth]acrylates and cyanoacrylates do not generally cross-react).[9,10]

This case raises awareness of the potential for ACD to IBOA in nail cosmetics. Although IBOA may be uncommon in the ingredients list, recent studies suggest it may be present but undeclared in nail products.[5,6] Considering the growing popularity of home gel nail kits and diverse uses of IBOA, including diabetes devices, non-occupational sensitization may have broader implications in the future.

AUTHOR CONTRIBUTIONS

Peter Baek: Writing – original draft; writing – review and editing; methodology. **Brandon L. Adler:** Writing – review and editing; conceptualization; investigation; data curation; methodology.

CONFLICT OF INTEREST STATEMENT

BLA has served as a research investigator and/or scientific advisor to AbbVie, Dermavant, and Skin Research Institute, LLC.

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REFERENCES

1. Aerts O, Herman A, Mowitz M, Bruze M, Goossens A. Isobornyl acrylate. *Dermatitis*. 2020;31(1):4-12. doi:10.1097/DER.0000000000000549
2. Guenther J, Norman T, Wee CP, Adler BL. A survey of skin reactions associated with acrylic nail cosmetics, with a focus on home kits: is there a need for regulation? *Dermatitis*. 2024;35(1):49-54. doi:10.1089/derm.2023.0204
3. Gatica-Ortega ME, Pastor-Nieto MA, Gil-Redondo R, Martínez-Lorenzo ER, Schöendorff-Ortega C. Non-occupational allergic contact dermatitis caused by long-lasting nail polish kits for home use: "the tip of the iceberg". *Contact Dermatitis*. 2018;78(4):261-265. doi:10.1111/cod.12948
4. Rodriguez I, George SE, Yu J, Adler BL. Tackling acrylate allergy: the sticky truth. *Cutis*. 2023;112(6):282-286. doi:10.12788/cutis.0909
5. Steunebrink IM, de Groot A, Rustemeyer T. Presence of 2-hydroxyethyl methacrylate (HEMA) and other (meth)acrylates in nail cosmetics, and compliance with EU legislation: an online market survey. *Contact Dermatitis*. 2024;90(1):60-65. doi:10.1111/cod.14441
6. Suuronen K, Ylinen K, Heikkilä J, et al. Acrylates in artificial nails-results of product analyses and glove penetration studies. *Contact Dermatitis*. 2023;14:266-272. doi:10.1111/cod.14474
7. Christoffers WA, Coenraads PJ, Schuttelaar MLA. Two decades of occupational (meth)acrylate patch test results and focus on isobornyl acrylate. *Contact Dermatitis*. 2013;69(2):86-92. doi:10.1111/cod.12023
8. Coe J, Robinson R, Wilkinson SM. Nail dystrophy mimicking psoriatic disease caused by contact allergy to nail varnish allergens including copolymers. *Contact Dermatitis*. 2021;85(5):600-602. doi:10.1111/cod.13926
9. Herman A, Mowitz M, Aerts O, et al. Unexpected positive patch test reactions to sesquiterpene lactones in patients sensitized to the glucose sensor FreeStyle libre. *Contact Dermatitis*. 2019;81(5):354-367. doi:10.1111/cod.13330

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10. de Groot AC, Rustemeyer T. 2-hydroxyethyl methacrylate (HEMA): a clinical review of contact allergy and allergic contact dermatitis. Part 2. Cross- and co-sensitization, other skin reactions to HEMA, position of HEMA among (meth)acrylates, sensitivity as screening agent, presence of HEMA in commercial products and practical information on patch test procedures. *Contact Dermatitis*. 2024;90(1):1-16. doi:10.1111/cod.14430

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