Hand dermatitis from daylight curing "hybrid" gel nail polish

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Introduction

Allergic contact dermatitis (ACD) from (meth)acrylates in gel nail polishes, cured by the use of UV or LED lamps, may affect women, men and occasionally even children (**1-3**). We report a case of ACD from a methacrylate-containing daylight curing "hybrid" gel nail polish.

Case report

A 49-year-old female had been using gel nail polishes, cured with a UV-light source, for the past few years. Six months prior to presentation she began to develop itchy, periungual dermatitis and onycholysis of the fingernails (**Figure 1A**). A dermatologist had advised her to stop the use of artificial nails, and to use regular nail varnish instead, explained to her as "products for which the use of an external, artificial light source (UV or LED) is not required"; no patch tests were performed at that time. After initial improvement the skin and nail problems relapsed, albeit to a lesser extent, which led the patient to question the diagnosis and the advice given. She was referred to our department for further investigation. Patch tests were performed with the Belgian baseline series, a cosmetic series and several (meth)acrylates, all from Chemotechnique Diagnostics (Vellinge, Sweden), except for 2-phenoxyethyl acrylate (PEA) and isobornyl methacrylate (IBOMA), which were obtained from Sigma Aldrich (Overijse, Belgium) and in-house diluted to 0.1% pet. and 2% pet., respectively. Following an occlusion of 2 days, the tests were removed and read, according to ESCD guidelines, on days (D)2 and D4. Positive reactions were observed to 2-hydroxyethyl methacrylate (2-HEMA)(++), hydroxypropyl methacrylate (HPMA)(++), ethyleneglycol dimethacrylate (EGDMA)(++), hydroxyethyl acrylate (HEA)(++), and PEA (+). There were no reactions to isobornyl acrylate (IBOA) nor to IBOMA. On D4 the patient brought in several of the nail varnishes she had recently been using. Surprisingly, some of these were labeled as "hybrid" gel nail polishes

(**Figure 1B**), containing methacrylates, among which HEMA-based copolymers and trimethylolpropane trimethacrylate, curable upon exposure to daylight. Thereupon the patient was advised to use classic nail varnish, without any (meth)acrylates and not requiring any artificial or natural light source for curing, such as, for example, those based on phthalic anhydride and/or adipic acid containing-copolymers. A few weeks later she was again free of symptoms.

Discussion and conclusion

(Meth)acrylates in gel nail polishes are increasingly recognized as important sensitizers, capable of provoking a myriad of clinical presentations (**1**), hence supporting the recent inclusion of 2-HEMA in the European baseline series (**4**). Mismatches between the (meth)acrylates used and the curing light sources may increase the risk of developing this type of ACD (**5**). The light sources themselves, i.e., UV-lamps, may equally cause skin and nail problems, including solar urticaria (**6**). Most patients with ACD from artificial nails are sensitized to methacrylates, 2-HEMA in particular, although other, potentially cross-reactive methacrylates may be present in the gel nail polishes used. Some patients are also co-sensitized to acrylates, such as HEA, a potential cross-reactor of 2-HEMA, or to 2-PEA, which, similar to IBOA, may not only be present in gel nail formulations, but also in medical devices. The present case highlights that (meth)acrylate-sensitized consumers may be at risk of developing ACD and nail problems from daylight curing “hybrid” nail polishes, difficult to distinguish from regular nail varnish.

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Figure 1: (A) residual onycholysis in a patient previously also affected by periungual allergic contact dermatitis due to **(B)** methacrylate-containing daylight curing “hybrid” gel nail polish.

(A)

(B)


LCN
WOW
HYBRID GEL POLISH
hypnotizing
Tageslichthärtender Nagellack
Daylight curing Nail Polish
Vernis à ongles durcissant à la lumière du jour
Smalto per unghie che indurisce alla luce del giorno
Esmalte para de uñas endurecible con luz del dia