

## Allergic contact dermatitis caused by tosylamide formaldehyde resin in nail varnish: an old allergen that has not disappeared

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### Case Report

A 67-year-old retired woman presented erythema, oedema and scaling, with marked glabella and neck involvement. Starting at the eyelids, this developed over a 1-year period. Patch testing (2 days) with the extended routine series (American Contact Dermatitis Research Group) showed positive reactions to tosylamide formaldehyde resin (++), 2-hydroxyethyl acrylate (++), 2-hydroxyethyl methacrylate (++), and her own nail lacquer (++) (International Contact Dermatitis Research Group grading system at 2 and 4 days) (1). She used nail varnish and intermittently artificial nails.

### Discussion

Nail lacquers (varnish and enamel) have long been used as a cosmetic to protect nails and for decorative purposes. Conventional nail lacquers generally consist of solvents, film-forming polymers, resins, which increase the adhesion of the film to the nail plate; plasticizers, which contribute to the flexibility and durability of the film-suspending agents, which increase the viscosity of the enamel and colouring agents (2).

Miller and Taussig (3) first reported dermatitis following the use of nail varnish, describing two patients who had dermatitis on the side of their necks and attributed this to their sleeping with recently varnished nails,

which came in contact with the affected areas. Since then, numerous such reports have appeared on individual cases of sensitivity reactions (4).

The areas most commonly affected are the eyelids, sides of the neck, personal regions, chin, cheeks, and anterior V of the neck (4). Areas of dermatitis on the sides of the neck may be due to contact of these areas with the nails during sleep or fingering the skin during waking hours. The chin and cheeks may be involved as a result of resting the chin on the palm of one hand with the finger flexed. The upper eyelids are frequently touched by the finger nails (4).

Guin (5) observed 215 patients who had eyelid dermatitis. He suggested that the allergy to artificial nails, and/or nail lacquer, occurred in 18 of the 215 cases (8%). There were 7 of 215 patients who were sensitive to tosylamide/formaldehyde resin [synonyms: toluenesulphonamide formaldehyde resin (TSAfr)], 5 to cyanoacrylate and 8 to nail methacrylates. TSAfr was shown to be the main allergen (6–8).

De Wit et al. (6) observed 8 cases of contact dermatitis from TSAfr in a nail hardener and Hausen et al. (7) showed 9 of the 12 patients were patch-test positive of TSAfr. Liden et al. (8) observed that 17 of the 18 patients were patch-test positive to TSAfr, and 17 of 18 were positive to their own nail varnishes. Moreover, they suggested that many of the patients had periungual lesions and their lesions were clearly associated with nail varnish because they resolved rapidly when its use was stopped. Periungual lesions are typically seen in patients with artificial nails and contact allergy to acrylate.

In our case, the patient was patch-test positive to 2-hydroxyethyl acrylate and 2-hydroxyethyl methacrylate (2-HEMA). Acrylic gel nails are widely used; 2-HEMA is one of the commercialized acrylates (9). She had previously used artificial nails, currently she does not use them and has no periungual lesion.

The majority of nail varnish dermatitis rapidly clears as soon as the patient stops using the lacquer (4). The average time for resolution is from 3 to 6 weeks. Our patient was 80% resolved within 6 weeks, after she stopped using the varnish.

Today, many nail polishes use the popular 'hypoallergenic' alternative polyester resins, which may also sensitize. Shaw (10) reported a case of

hypoallergenic nail varnish allergy. In this instance, the patient was positive to the polyester resin and her own nail varnish.

Our patient used 'high end' varnish label and showed that it contained tosylamide formaldehyde resin, rather than the recently commercialized polyesters. We suspect that this resin should remain in the extended routine series until it is withdrawn from commercial use. It will be years before we have adequate quantitative data on the allergenicity potential of the polyester replacements.

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