

Occupational allergic contact dermatitis to acrylates and methacrylates

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Owing to the generalized use over the past few years, (meth)acrylates have become a major cause of contact dermatitis. In fact, the clinical

repercussions and the therapeutic problems derived from their use, nowadays, present a health hazard. The prevalence of contact sensitization to (meth)acrylates ranges between 5% and 10% among dental technicians and dentists, a fact that has been confirmed by patch testing (1).

The most frequent case is allergic contact dermatitis, which can lead to subacute or chronic dermatitis, generally located in the fingertips because of direct contact with (meth)acrylic resin. In some patients, the location of the lesions corroborates an airborne dermatitis (1, 2).

We present a case of occupational allergic contact dermatitis to glycidyl methacrylate, a substance used for coating lenses in spectacles.

Case Report

Our patient is a 26-year-old woman who works for an optical company with a history of rhinoconjunctivitis and bronchial extrinsic asthma between 5 and 7 years of age, and an allergy to pollen since 5 years of age. For the last 2 years, her work consisted of refilling injectors with a mixture of various chemical substances containing (meth)acrylates. The process consisted of coating the lenses with this liquid synthesis and then solidifying it by means of ultraviolet light, and the application of heat for 120 min. She used, on average, 10 pairs of latex gloves per day.

During the consultation, she referred to the appearance of itchy vesicles in the first and second fingertips of her right hand that later spread to the rest of her fingertips, the dorsum of the fingers and the rest of both hands. The lesions disappeared after 1 month of treatment with topical corticosteroids, coinciding with her vacation period. Nevertheless, similar lesions reappeared just 1 day after returning to work only to disappear again after 3 weeks during her sick leave.

The patch test was performed with the Spanish standard series, (meth)acrylates series [Chemotechnique's (meth)acrylate printing series, and (meth)acrylate adhesives, dental and other series; Chemotechnique, Malmö, Sweden], epoxi series (Chemotechnique), isocyanates series (Chemotechnique), and Transhade-SC Brown® and Gray® (Tokuyama Corporation, Tokyo, Japan). The patch test support

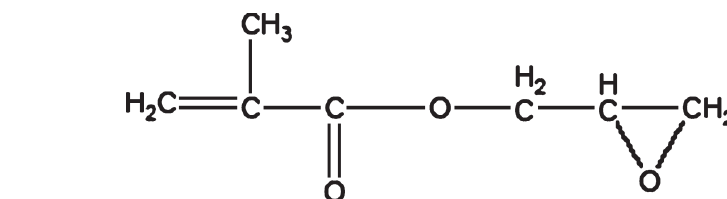


Fig. 1. Structural formula of glycidyl methacrylate.

used for supplementary series was Finn Chambers (Epitest Ltd Oy, Tuusula, Finland) on adhesive Scanpor tape® (Alpharma AS, Norgesplaster, Venne-sla, Norway) occluded for 2 days. The patches were positive (++) at day 2 (D2) and at D4 to 2-hydroxyethyl methacrylate (2-HEMA), ethylene glycol dimethacrylate (EGDMA), 2-hydroxypropyl methacrylate (2-HPMA), diethylene glycol diacrylate (DEGDA), triethyleneglycol diacrylate (TEGDA), epoxi cycloaliphatic resin, and Transhade-SC Brown® 1% in pet. and Gray® 1% in pet. The components identified, glycidyl methacrylate and dimethacrylate ethoxy bisfenol A, in the safety data sheets of the Transhade-SC Brown® and Gray® were patch tested, being positive for glycidyl methacrylate to 0.1% in acetone (acet.) (++) and to 0.05% (+). Tests with glycidyl methacrylate 0.05% in acet. in 45 control subjects were negative.

A year and a half ago, after being diagnosed with occupational allergic contact dermatitis to (meth)acrylates, our patient was transferred to a new department. Since then, her lesions have not recurred.

Discussion

The case presented above corresponds to an occupational allergic contact dermatitis caused by direct contact with glycidyl methacrylate, an agent used to stiffen the coating of lenses in spectacles. There are many other chemical substances of a similar composition. The structural formula of glycidyl methacrylate (CAS number 106-91-2) is given in Fig. 1. It has multiple applications, in particular, in the synthesis of intermediate chemical products and adhesives; to thin epoxy resins; in emulsions to impregnate textile and paper material; as a copolymer for immunoagglutination tests; in liquid chromatography; in anaerobic sealants; and in dental composite resins and bone cements.

In the literature, occupational allergic contact dermatitis to glycidyl meth-

acrylate is exceptional (3, 4). 3 patients diagnosed of occupational allergic contact dermatitis to glycidyl methacrylate used in the synthesis of anaerobic sealants have been reported (3). A case of occupational allergic contact dermatitis to glycidyl methacrylate used as an emulsion to impregnate textile and paper material (4) has also been published. In the reports published, the glycidyl methacrylate was patch tested to 1% in pet. (3) and to 0.1% and 0.05% in acet. (4). In our patient, glycidyl methacrylate was patch tested to 0.1% and 0.05% in acetone, being interpreted as an allergy because of the fact that all the controls were negative. It is difficult to determine whether contact sensitization to 2-HEMA, EGDMA, HPMA, DEGDA, and TEGDA is concomitant, a cross-reaction or even a reaction to the impurities in preparations which use all these compounds, a fact that has also been discussed by other authors (5). We have not found direct relevancy between the contact sensitization and the epoxy cycloaliphatic resin.

In general, the directions for use of chemical materials are inadequate because they sometimes do not include all the chemical substances contained in the product (6). Safety masks, gowns, and gloves 4H (Safety 4 A/S, Lyngby, Denmark) are useful as primary and secondary prevention measures in cases of contact sensitization to (meth)acrylates. Gloves made of latex, vinyl, polyethylene, and nitrile rubber do not prevent the appearance of dermatitis in sensitive patients, as is the case of our patient, who had actually been using latex gloves.

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