

CASE REPORT

Acrylate-induced allergic contact dermatitis in a car windscreen repairer

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Abstract

We report a case of an allergic skin reaction to ultraviolet-cured acrylates in a windscreen repair worker. The patient presented with a 6 month history of fingertip dryness, vesicles and desquamation. He had worked as a self-employed car windscreen repairer for 19 years. Previous management with vinyl glove protection and treatment with clobetasol propionate ointment had produced little improvement. He was patch tested to the British Society for Cutaneous Allergy standard and preservatives series and to the two acrylates used in his work environment, identified using safety data sheets, methyl methacrylate 2% pet and 2-hydroxyethylmethacrylate (2-HEMA) 2% pet. A positive reaction was seen at Day 4 to 2-HEMA, but all other patch tests were negative. An occupational allergic contact dermatitis to 2-HEMA was diagnosed. The patient was given avoidance advice and advised to use nitrile gloves. Although he was unable to give up his current work, he has continued his job using nitrile gloves with marked improvement.

Key words

Allergy; chemical exposure; dermatology; occupational contact dermatitis; resins.

Introduction

Occupational allergic contact dermatitis related to acrylates is becoming increasingly recognized amongst beauticians and nail technicians [1]. Other industries using acrylates include the painting, printing, glass and fibre industries and dentistry [2]. We present a case of allergic contact dermatitis caused by 2-hydroxyethylmethacrylate (2-HEMA) from an ultraviolet (UV)-cured windscreen repair resin.

Case report

A right-handed 57-year-old man presented with a 6 month history of fingertip dermatitis. Examination revealed dryness, vesicles, blisters and desquamation of all fingertips with the right hand more severely affected. He attributed his skin condition to a bleach spray he had used 1 month before the onset of symptoms. Past medical history included rheumatoid arthritis, but there was no history of atopy. He had worked as a self-employed car windscreen repairer for 19 years. His work frequently involved the use of UV-cured products as an adhesive during the repair process. Prior to referral to the contact clinic, hand protection with vinyl gloves and topical

treatment with clobetasol propionate ointment had produced little improvement. Safety data sheets showed that he worked with two windscreen repair resins that contained acrylates: 'Pit Fill Resin UVSO1AF' containing 2-HEMA and 'UV resin (part numbers UV002AF-UV5AF-UV20AF-UV50AF)' containing methacrylate monomers. He was patch tested to the British Society for Cutaneous Allergy standard and preservatives series and the two acrylates used in his work environment, methyl methacrylate 2% pet and 2-HEMA 2% pet. A positive reaction was seen at Day 4 to 2-HEMA, all other patch tests being negative. We diagnosed an occupational allergic contact dermatitis to 2-HEMA and he was given avoidance advice and advised to use nitrile gloves as these provide better protection than latex or vinyl gloves. On follow-up, he reported that his symptoms had resolved with the use of nitrile gloves although he reported having recently had occasional mild dermatitis on his right hand.

Discussion

Acrylates were first developed in the 1930s. In 1947, Stevenson and Moody were the first to report an

occupationally acquired allergic contact dermatitis [3,4]. Acrylates are monomers that polymerize to form plastic materials [5]. As monomers, acrylates are volatile potent allergens, which cause allergic contact dermatitis by direct or indirect exposure. However, once polymerized, often by exposure to heat or UV light, they become relatively inert. Our patient used a UV curing lamp to polymerize the acrylate resins. After ethylene glycol dimethacrylate, 2-HEMA is the acrylate that most commonly causes positive reactions on patch testing [6]. Exposure to acrylates usually induces a type IV hypersensitivity reaction, which manifests as dermatitis. In our case, sensitization to 2-HEMA appeared to have occurred during the UV curing process prior to polymerization. Ectopic dermatitis has been reported to occur with acrylates when small amounts of allergen are transferred to different sites of the body via the fingertips [1]. Airborne exposure has also been described [7], but this was not seen in our patient.

Unlike employees within larger organizations, self-employed windscreen repair workers are unlikely to have access to occupational health services. Consequently important advice on avoidance of skin contact and appropriate glove use may not be available to them. Although nitrile gloves offer the best protection, acrylates can penetrate them with prolonged use [8,9], and it is important that users are aware of their glove 'breakthrough time' and the need to change gloves at appropriate intervals. Munksgaard [8] reviewed the breakthrough times for HEMA when using either latex or nitrile gloves and found the mean breakthrough time for latex gloves to be 4.9 minutes compared with 15.7 minutes for nitrile gloves. Protection was reduced in the presence of solvents [9]. In addition to correct glove selection, patients should be given training and information on the correct use of their gloves to prevent skin contamination on removal [10].

To our knowledge, this appears to be only the fourth reported case of allergic contact dermatitis in a windscreen worker. The case highlights the importance of identifying the relevant allergen using safety data sheets and providing information concerning optimal glove use. Furthermore in view of the recent increase in acrylate allergy amongst nail technicians, this case serves as a

reminder that UV-cured acrylates are used in a variety of other occupational settings.

Key points

- Ultraviolet-cured acrylates are skin sensitizers used in a variety of occupational settings including the beauty industry, painting, printing, glass and fibre industries and dentistry.
- Use of safety data sheets is important in identifying suspect causative agents when patch testing.
- Awareness of glove 'breakthrough time' is important to ensure frequent glove changes to prevent symptom recurrence.

Conflicts of interest

None declared.

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