

Contact allergy to methyl ethyl ketone peroxide and cobalt in the manufacture of fibreglass-reinforced plastics

M. BHUSHAN, N. M. CRAVEN AND M. H. BECK

Contact Dermatitis Investigation Unit, Hope Hospital, Salford M6 8HD, UK

Key words: allergic contact dermatitis; occupational; methyl ethyl ketone peroxide; cobalt; polyester resin; prevention.
© Munksgaard, 1998.

Unsaturated polyester resins are thermosetting compounds with many uses in the home and in industry. Although allergic contact dermatitis from them is described (1–2), it is rare compared to extensive skin contact that occurs among workers in manufacturing plants.

Case Report

A 46 year-old-man developed a work-related dermatitis of the palms of both hands, with recurrent bouts of vesiculation, 12 months after starting work in a resin shop involved in the manufacture of children's rides. He added fibreglass, a catalyst (methyl ethyl ketone peroxide (MEK peroxide) in dibutyl phthalate) and unsaturated polyester resin (with premixed cobalt-containing accelerators) to an automated mixing machine connected to a spray gun used to fill moulds. The mixture was hand rolled to ensure that optimal thickness was achieved prior to curing. Rubber gloves were worn at times but no other personal protective equipment (PPE) was provided. The patient's eczema cleared after a 10-day course of moderately potent topical corticosteroids and transfer to the joinery department. He has been free of symptoms since this time.

Patch testing with a standard series, epoxy series, plastic additives series, polyester resin (10% pet.), MEK peroxide (1% pet.), dibutyl phthalate and other relevant work materials, together with topical medicaments, elicited ++ reactions at 2 and 4 days to cobalt chloride (1% pet.), carba mix (3% pet.), thiuram mix (1% pet.), benzoyl peroxide (1% pet.) and MEK peroxide (1% pet.). There was no reaction to the polyester resin or dibutyl phthalate. 50 control subjects showed no positive reactions to MEK peroxide 1%.

Discussion

MEK peroxide (CAS: 1338–23–4), like benzoyl peroxide, is a source of free radicals that rapidly initiates cross-linking and polymerization of polyester resin. Although known to cause irritant contact dermatitis (1), it was not

until 1964 that the 1st case of allergic contact dermatitis was reported (3). In a review of polyester resin dermatitis, Malten (4) stated that such reactions were no longer common. However, since that time, a further report of contact allergy to MEK peroxide in a paint sprayer has been published (5).

Our patient showed positive reactions to MEK peroxide, benzoyl peroxide, rubber chemicals and cobalt chloride, but not to the polyester resin itself. As we were unable to confirm exposure to benzoyl peroxide, there may have been cross-reactivity, as noted in a previous case (5). The positive reaction to cobalt may reflect sensitivity to accelerators such as cobalt naphthenate present within the resin at low concentrations. The patient's PPE comprised a pair of rubber gloves, to which he was sensitized. In addition, he was supplied with neither a face mask nor protective eyewear, even though there have been reports of keratitis associated with a single exposure to MEK peroxide (6).

We report this case of MEK peroxide and cobalt allergy to emphasize the importance of testing both the resin and the additives in cases of polyester resin dermatitis.

References

1. Bourne L B, Milner F J M. Polyester resin hazards. *Br J Indust Med* 1963; 20: 100–109.
2. Lim J, Balzer L J, Wolf C R, Milby T H. Fibre-glass-reinforced plastics: associated occupational health problems. *Arch Environ Health* 1970; 20: 540–544.
3. Malten K E. *Industrial toxicology and dermatology in the production and processing of plastics*. Amsterdam: Elsevier, 1964: 78–79.
4. Malten K E. Recently reported causes of contact dermatitis to synthetic resins and hardeners. *Contact Dermatitis* 1979; 5: 11–23.
5. Stewart L, Beck M H. Contact sensitivity to methyl ethyl ketone peroxide in a paint sprayer *Contact Dermatitis* 1992; 26: 52–53.
6. Fraunfelder F T, Coster D J, Drew R, Fraunfelder F W. Ocular injury induced by methyl ethyl ketone peroxide. *Am J Ophthalmol* 1990; 110: 635–640.