

cipients of Carteol<sup>®</sup> and to other  $\beta$ -blockers, was negative (Table 1). A use test was negative. Having stopped treatment with Carteol<sup>®</sup>, however, the patient recovered completely within 1 week.

### Discussion

False-negative patch tests to ophthalmic  $\beta$ -blockers have previously been described (1). Enlargement of test areas to 4 cm<sup>2</sup> to avoid such false-negative results has been proposed (2). In our case, 1-cm diameter (Leucotest<sup>®</sup>) was insufficient, even though the patch test concentration was 2 $\times$  (5%) the concentration in the eyedrops. Positive reactions have, however, been reported to patch test concentrations ranging from 0.5% to 1% (1, 4).

There were no positive reactions to other  $\beta$ -blockers, such as befunolol and betaxolol, which might be responsible for crossreaction (3).

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## The patch test concentration for methylchloroisothiazolinone/methylisothiazolinone

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**Key words:** Methylchloroisothiazolinone/methylisothiazolinone; patch testing technique; contact allergy; preservatives; false-positive reactions; doubtful reactions; allergic reactions; 100 ppm. © Munksgaard, 1998.

The ideal patch test concentration should avoid both false-positive and false-negative results. With a potent contact sensitizer such as methylchloroisothiazolinone/methylisothiazolinone (MCI/MI), there is also a particular need to avoid patch test (active) sensitization. 100 ppm (0.01% w/v) aq. is the current concentration of MCI/MI in the European standard series. There are more positive patch tests to 300 ppm than to 100 ppm, but the higher concentration can sensitize (1). There were more positive reactions when the equivalent of 150 ppm MCI/MI in the TRUE Test<sup>TM</sup> was compared to the standard preparation (2). Testing at 200 ppm has been reported, but differentiation between an irritant and an allergic response was apparently not possible in one series (3), and no irritant responses were seen in another (4). To investigate this problem further, a comparative study between 100 ppm and 200 ppm MCI/MI was performed.

### Methods and Results

590 (217 male and 373 female) consecutive patients undergoing investigation for allergic contact dermatitis at

Gentofte Hospital, in the period January to December, were simultaneously patch tested with 15  $\mu$ l of 100 ppm a.i. (w/v) aq. MCI/MI and 15  $\mu$ l of 200 ppm (w/v) a.i. aq. MCI/MI in Finn Chambers on Scanpor tape. All tests were read at 2, 3, and 4–7 days, following ICDRG guidelines.

The results are summarized in Table 1. Patch testing at 200 ppm MCI/MI, compared to 100 ppm MCI/MI, showed more irritant and doubtful results, but no difference in the number of positive results. No patch test sensitization was detected.

### Discussion

7 of 8 patients with a positive patch test at 200 ppm and a negative patch test at 100 ppm had negative lymphocyte provocation tests, suggesting that there is a high frequency of irritant, compared to allergic, reactions at this concentration (5). The results of this study also suggest that 200 ppm MCI/MI can be irritant. Although these weak reactions were probably an irritant response they could, however, represent a weak allergic response. At this stage, 100 ppm MCI/MI still seems to be the most appropriate patch test concentration.

### References

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Table 1. Results of patch testing with 100 ppm and 200 ppm MCI/MI in 590 patients

|         | Positive<br>(+/+ +/+ +++) | Frequency<br>rate (%) | Doubtful<br>(?+) | Irritant<br>(IR) |
|---------|---------------------------|-----------------------|------------------|------------------|
| 100 ppm | 15/590                    | 2.5                   | 11/590           | 2/590            |
| 200 ppm | 16/589                    | 2.7                   | 22/589           | 3/589            |

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## Contact allergy to 2-aminoethanol (monoethanolamine) in a soluble oil

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**Key words:** allergic contact dermatitis; water-based metalworking fluid; occupational; monoethanolamine; metalworker. © Munksgaard, 1998.

### Case Report

A 60-year-old atopic man presented with a 40-year history of hand dermatitis affecting the dorsa and sides of the fingers, with recent exacerbation of his condition and spread to the forearms. He had worked as a turner in a metalworking plant since his eczema had worsened. He reported that his symptoms were significantly reduced when he was away from work. He was in regular contact with a soluble oil (water-based metalworking fluid) that was diluted with water prior to use. Although he intermittently wore gloves, he needed to remove them for fine work and also found that the metal chips (swarf) damaged the plastic lining.

Patch testing was performed to our standard series, oils and coolant series (which includes di- and triethanolamine at 2% pet.) and the soluble oil as is and at 50%, 25% and 10% aq. Erythematopapular (++) reactions at D4 were seen to the undiluted soluble oil and 50% dilution, with + reactions to the 25% and 10%. The manufacturer of the soluble oil was contacted for further information on constituents of the coolant. Patch testing to all 18 of these constituents revealed a ++ reaction at D4 to 2-aminoethanol (monoethanolamine), an anti-corrosion and emulsifying agent, tested in 2% pet. 50 control subjects showed no positive reactions to this component (also tested at 2% pet.).

Since patch testing, our patient has used a semi-synthetic soluble oil. According to the manufacturer, monoethanolamine is not contained in this cutting fluid. Since avoidance of the original cutting oil, the patient's dermatitis has improved (although not entirely cleared) and he has continued in his original occupation.

### Discussion

Most soluble oil dermatitis is irritant (1), but occasionally, relevant allergens are found. Patch testing to the oil as is can be useful for initial screening, as few additives

are dilute enough in the concentration to escape detection if allergy is present. However, due to the chance of false-positive reactions, and the possibility of missing a relevant allergen (2), it is better to test to all the components of an oil, at the appropriate concentrations and in the correct vehicle, to clarify the situation in a case of suspected occupational dermatitis to a cutting oil (3).

Monoethanolamine is not a well-known allergen, with only 2 previous reports of allergic contact dermatitis from it documented in the literature, in both cases there being exposure to metalworking fluid (4, 5). To our knowledge, a case of allergic contact dermatitis from monoethanolamine alone has not previously been reported.

The prognosis for recovery from an occupational dermatitis due to soluble oils is variable (6) and it seems that the overall aim should be one of prevention of initial sensitization. In our case, the patient's condition improved with removal of the allergen and allowed him to continue in his work.

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